

# POTENTIALS OF COVID-19 FOR ECONOMIC GREATNESS IN AGRICULTURE: THE NIGERIAN CASE

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## **ABSTRACT**

*The important benefits of the agricultural sector to the Nigerian economy are enormous; but with COVID-19 pandemic, the challenges hampering the attainment of food security in Nigeria could deepen. This is what necessitated this study; to among other things, investigate the impact of COVID-19 pandemic on the Nigerian agricultural sector. The study explored the e-survey multi-stage sampling technique of data collection. A well-structured questionnaire was electronically distributed to 245 respondents drawn from the five Southeast states ADPs comprising of Abia, Imo, Anambra, Ebonyi and Enugu states of Nigeria. The reliability of the instrument was determined using the Cronbach's Alpha coefficient. The study applied the mean, standard deviation, and the paired sample statistics to determine the effect of COVID-19 pandemic on the Nigerian agricultural sector. The findings of the study in answering the formulated research questions indicated that COVID-19, on average, influenced the Nigerian agricultural sector to a great extent. On the test for individual hypothesis, the result revealed that the pandemic exerted significant positive effect on Nigerian farmer's earnings, influenced economic greatness potentials of the Nigerian agricultural sector; exert a negative significant effect on agricultural productivity in Nigeria, and a positive insignificant effect on Nigeria's foreign exchange earnings through agricultural produce exportation. Also, the findings of the study revealed that the policies of the Nigerian government in response to the pandemic have significant effect on agricultural sector's contribution to Nigeria economic recovery and growth. The study concluded that COVID-19 pandemic, though has its negative impacts on the economy, but also became a window to the realization and opening of untapped potentials for economic greatness of the Nigerian agricultural sector. The study recommended among others, the sustainability of policies and intervention programmes of the government, with effective feedback mechanism to ensure that these programmes are not subverted.*

**Keyword:** *Agricultural Productivity, COVID-19 Pandemic, Nigerian economy.*

## **1. INTRODUCTION**

Evidently, from the history of human existence, humanity have been ravaged by disease outbreaks of varying degrees and magnitudes; which have in most cases altered the course of history; and as well redirect the set order and operational sequence that makes for effective and

mutual coexistence of humanity and the interaction between human and material resources in a global world.

There are many examples of global outbreaks in history; the most recent is the COVID-19 pandemic. COVID-19 began as an epidemic in China before making its way around the world in a matter of months and becoming a pandemic.

On January 23, 2020, the World Health Organization's International Health Regulations (IHR) Emergency Committee advised that "all countries should be prepared for containment, including active surveillance, early detection, isolation and case management, contact tracing and prevention of onward spread of 2019-nCoV infection, and to share full data with WHO." On January 30, 2020, the WHO declared COVID-19 to be a public health emergency of international concern (Dexit et al., 2020).

On February 27, 2020, the Federal Republic of Nigeria recorded its first case of the COVID 19, through an infected European business traveller who arrived Lagos, Nigeria for a series of business meetings. Over the course of the following weeks, the number of cases increased drastically and has shown no signs of slowing down. Discriminating against no one; the upper, middle and lower class, black, white, Hispanic, etc., with its effects on human lives and day to day activities nothing less than devastating (Bloomfield, 2020).

On March 11, 2020, the World Health Organization (WHO) characterized COVID-19 as a pandemic, pointing to over 3million cases and 207,973 deaths in 213 countries and territories (WHO, 2020). The outbreak no doubt, has not only constituted public health crisis in varying quarters, but has bedevilled the economic performance of nations.

Alterations orchestrated by disease outbreaks impede economic activities and international relatedness among nations. Notably, as stressed by Anton Pak *et al* (2020), significant economic impact has already occurred across the globe due to reduced productivity, loss of life, business closures, trade disruption, and decimation of the tourism industry. A global pandemic will have a serious supply-side impact – especially on foreign travel, manufacturing and investment. The uncertainty and decline in travel will also lead to people staying off work, losing income and causing a fall in demand (Tejvan, 2020).

As scholarly contended, COVID-19 may be that 'wake up' call for global leaders to intensify cooperation on epidemic preparedness and provide the necessary financing for international collective actions, both in curtailing the present pandemic, and in forestalling future outbreaks. Regrettably, there has been ample information on the expected economic and health costs of infectious disease outbreaks as posited by WHO (2019) and Yamey, G *et al.*, (2017); but the world has failed to adequately invest in preventive and preparedness measures to mitigate the risks of large epidemic outbreaks.

In the case of COVID-19, such international and governmental collaboration is vital, especially, as it relates to the clinical researches, in the development and production of a vaccine for the virus, and the success of medical and other scientific advances to contain it.

The Coalition for Epidemic Preparedness Innovations (CEPI), a global partnership launched in 2017, has traded global efforts in COVID-19 vaccine development activity and is advocating for

strong international cooperation to ensure that vaccine, when developed, will be manufactured in sufficient quantities and that equitable access will be provided to all nations regardless of ability to pay (Le TT, et al., 2020). While governments in both emerged and emerging economies are on the look-out for the development and production of a vaccine for COVID-19, stringent measures and policies have been formulated with the sole aim of curtailing its spread and to reduce person-to-person transmission.

The combination of policies such as social/physical distancing, lockdowns, and quarantines, imply a slowdown ties for an uncertain period of time, crashing markets and potentially leading to the closure of businesses, sending millions of workers home. Labour, a key factor of production, had been quarantined in most sectors in the economy, borders have been closed and global value chains have been disrupted. Most estimates show a contraction of the level of output globally (Constantino and Andy, 2020).

Nigeria, like most other developing countries, finds herself in perilous times faced with a twin-threat; the health crisis emanating from the COVID-19, and an economic crisis with an already rapidly contracting fiscal space amidst a global recession. Commendable efforts to contain the virus at home have been established, and intensions behind policy decisions are well reasoned and used elsewhere. However, literal implementation of measures pioneered elsewhere may instead clash with the fundamentals that drive the country's unique economic and social structures and could disproportionately impact its most vulnerable populations (UNDP, 2020).

The pandemic and efforts to contain it have triggered an unprecedented collapse in oil demand and a crash in oil prices, which is the major source of revenue for the Nigerian economy. While agricultural produce are well supplied nationally and globally, trade restrictions and supply chain disruptions could yet raise food security issues in some places. Low oil prices are likely to provide, at best, temporary initial support to growth once restrictions to economic activity are lifted. Low oil prices offer an opportunity to oil producers to diversify their economy.

The Nigerian agricultural sector holds the key to the country's drive for economic diversification. The sector has grown consistently at an average of 2.6% over the past three years. As at Q1 2020, agriculture accounted for about 22% of the Nigerian gross domestic product (GDP) compared to oil and gas (9.5%), manufacturing (9.7%), financial services (3.8%) and trade (16.1%). In addition, the agricultural sector remains the largest employer of labour in the country, providing jobs for more than one-third (86.4%) of the Nigerian labour force (PwC Nigeria, 2020). Nigeria is a major producer of some agricultural crops in the world. This is as a result of the diverse cash crop supporting soil and climate with which Nigeria is blessed with. From the North to South, East to the West of Nigeria, there are abundant varieties of agricultural products and resources that are found to grow and suitable for cultivation in the soils in the regions and states. Major crops include beans, rice, sesame, cashew nuts, cassava, cocoa beans, groundnuts, gum Arabic, kolanut, maize (corn), melon, millet, palm kernels, palm oil, plantain, rubber, sorghum, soya beans, bananas, yam, sugar cane, etc. (Abdulwal, 2020).

The important benefits of the agricultural sector to Nigeria's economy include: the provision of food, contribution to the gross domestic product (GDP), provision of employment, provision of raw materials for agro-allied industries, and generation of foreign earnings (Omobowale *et al.*, 2009).

With COVID-19, the challenges hampering the attainment of food security in Nigeria could deepen. The impact is already being felt in the form of rising food prices. By April 2020, food inflation had risen to 15% compared to 14.7% in December 2019. The intra and interstate movement restrictions could hinder farmers from accessing their farms in other state locations or procuring inputs such as seedlings and farm implements. Furthermore, the restrictions may hamper food distribution, which could result in post-harvest losses, reduced market supply and further increases in food prices. It is on this premise that this study is necessitated to investigate the potentials of COVID-19 for economic greatness in Agriculture; the Nigerian case. We will examine the impact of the COVID-19 pandemic on the Nigerian Agricultural sector, and as well, the effectiveness of some government policies on reducing the impact on Agriculture, and the extent the policies have fared. The specific objectives of this study will include the following:

1. To ascertain the extent to which COVID-19 has affected agricultural productivity in Nigeria.
2. To determine the extent to which COVID-19 has affected Nigeria's foreign exchange earnings through agricultural produce exportation.
3. To ascertain the extent to which Nigerian farmers' earnings have been affected by COVID-19 pandemic.
4. To determine the extent of economic greatness potentials that COVID-19 has on the Nigeria's Agricultural sector.
5. To ascertain the effectiveness of government's policies, in response to COVID-19, in enhancing Agricultural sector's contribution to economic recovery and growth.

### **Research Questions**

The following research questions, which will serve as a guide for the study are formulated thus;

1. To what extent has Agricultural productivity in Nigeria been affected by COVID-19 pandemic?
2. How has Nigeria's foreign exchange earnings through Agricultural Produce exportation been affected by COVID-19 pandemic?
3. To what extent has the earnings of Nigerian farmers been affected by COVID-19 Pandemic?
4. How has the economic greatness potentials of the Nigerian Agricultural sector been influenced by COVID-19 Pandemic?
5. To what extent have government policies in response to COVID-19 affected Agricultural sector's contribution to economic recovery and growth?

### **Research Hypotheses**

The following are the hypotheses of the study, and they are stated in the null;

1. Agricultural productivity in Nigeria is not significantly affected by COVID-19 pandemic.
2. Nigeria's foreign exchange earnings through Agricultural Produce exportation is not significantly affected by COVID-19 pandemic.

3. The earnings of Nigerian farmers is not significantly affected by COVID-19 Pandemic.
4. Economic greatness potentials of the Nigerian Agricultural sector has not been significantly influenced by COVID-19 Pandemic.
5. Nigerian government policies in response to COVID-19 have no significant effect on agricultural sector's contribution to economic recovery and growth.

Notably, a pandemic, as a form of a disaster is a complex and unpredictable situation that, may leave limited opportunities to conduct well planned, organized and controlled researches and experimental trials (Benight and McFarlane, 2007).

Available literatures on the subject matter reviewed in the course of this study were scanty with little or no adequate data for analysis. Some were unable to conduct comprehensive surveys to empirically substantiate their findings with generated data as it relates Nigerian farmers and COVID-19 pandemic. We viewed the lockdown and restricted movement imposed by various government before now, to curtail the spread of the virus, and the precarious situations the pandemic subjected people to, as a reason to this. It is this gap that this study has come to fill inter alia.

## 2. LITERATURE REVIEW

### 2.1 Conceptual Review

By definition, a pandemic is a global disease outbreak. An influenza pandemic occurs when a new influenza virus emerges for which there is little or no immunity in the human population and begins to spread efficiently from person to person, causing serious illness, sometimes resulting in death. Because of its potential to cause significant illness and death worldwide, experts believe that a global influenza pandemic will have a major negative impact on the global economy, including travel, trade, tourism, food, retail consumption and eventually, investment and financial markets (FRN, 2013).

Other notable pandemics in history

One of the most famous pandemics in human history was the Black Death, a global outbreak of bubonic plague between the years of 1346 and 1353. The disease is caused by the bacterium *Yersinia pestis*, and resulted in the death of somewhere between 30% and 60% of the population of Europe during the mid-14th century, although experts believe the disease originated in Central Asia decades earlier (Hickok, 2020).

The first cholera pandemic occurred in 1817 and originated in Russia, where 1 million people died, according to History.com. The bacterium was transmitted to British soldiers, who carried it into India and eventually the rest of the world.

The Russian flu of 1889 is considered the first major flu pandemic. It likely started in Siberia and Kazakhstan before making its way west to Europe and across the Atlantic Ocean to North America and later Africa. By the end of 1890, an estimated 360,000 people had died from the Russian flu, according to History.com.

HIV, which is the virus that causes AIDS, likely developed from a chimpanzee virus that was transferred to humans in West Africa in the 1920s. The virus made its way around the world and HIV/AIDS was a pandemic by the late 20th century. An estimated 35 million people have died

from the disease since its discovery, but medication developed in the 1990s now allows people with the disease to experience a normal life span with regular treatment. Even more encouraging, two people have been cured of HIV as of early 2020 (Owen, 2020; Hickok, 2020). Now thanks to advances in modern medicine, HIV is considered endemic, which means the rate of the disease is stable and predictable among certain populations, according to the American Medical Association, in Hickok (2020).

### **Characteristics and challenges of a pandemic**

As posited by Pandemicflu.com in FRN (2013), the characteristics and challenges of a pandemic include the following:

- Rapid Worldwide Spread
- Health Care Systems Overloaded
- Medical Supplies Inadequate
- Economic and Social Disruption

### **WHAT HAS THE NIGERIAN GOVERNMENT DONE?**

The Nigerian government has taken numerous health, social, and economic measures to cushion the impact of COVID-19. However, some of the policy responses have weaknesses and, taken together, are not commensurate with the magnitude of the problem.

The major strategic responses by the federal government as posited by *Dexit et al.*, (2020) include:

- **The Economic Stimulus Bill 2020.** The House of Representatives passed the Emergency Economic Stimulus Bill 2020 on March 24 to provide support to businesses and individual citizens of Nigeria. The proposed law aims to provide 50 percent tax rebates to businesses that are registered under the Companies and Allied Matters Act so they can use this saving to continue employing their current workers.
- **Cash transfers.** On April 1, 2020, the government announced that it will make transfers of 20,000 Naira (\$52) to poor and vulnerable households registered in the National Social Register (NSR).
- **Central Bank of Nigeria stimulus package.** The CBN's stimulus package offers a credit of 3 million Naira to poor families impacted by COVID-19.
- **Food assistance.** After President Buhari imposed the lockdown in Lagos, FCT, and Ogun states on April 1, 2020, the Federal Ministry of Humanitarian Affairs Disaster Management and Social Development announced that it will provide food rations to vulnerable households in these states.

### **The Concept of Agricultural Productivity**

Agricultural Productivity, according to Wiebe (2003), is a measure of the amount of agricultural output produced for a given amount of inputs, such as an index of multiple outputs divided by an index of multiple inputs (e.g., the value of all farm outputs divided by the value of all farm inputs).

The index-number approach to studying productivity estimates total factor productivity (TFP), which measures levels and changes in agricultural output relative to changes in an aggregated index of multiple inputs.

The inputs, as opined by Wiebe (2003), have been classified as follows:

- Conventional inputs: Land, Labor, Livestock, Tractors, Fertilizer
- Labor quality: Life expectancy, Adult illiteracy
- Institutional quality: Armed conflict
- Infrastructure: Road density
- Land quality: Annual rainfall, Percent arable or permanently cropped, Percent not irrigated, Good soils and climate

### **Factors that Affect Agricultural Productivity**

As contended by Tanja (2020), a number of different factors can cause agricultural productivity to increase or decrease. It is important to note that productivity is not an absolute measure, but rather a reflection of the ratio between inputs and outputs. A field that produces twice as much of some crop as it did in a previous year is not necessarily twice as productive; if the farmer spent twice as much on that field, the net change in productivity would be zero.

Factors that affect farm productivity and often can't be in the control of the farmer, according to Tanja (2020) are:

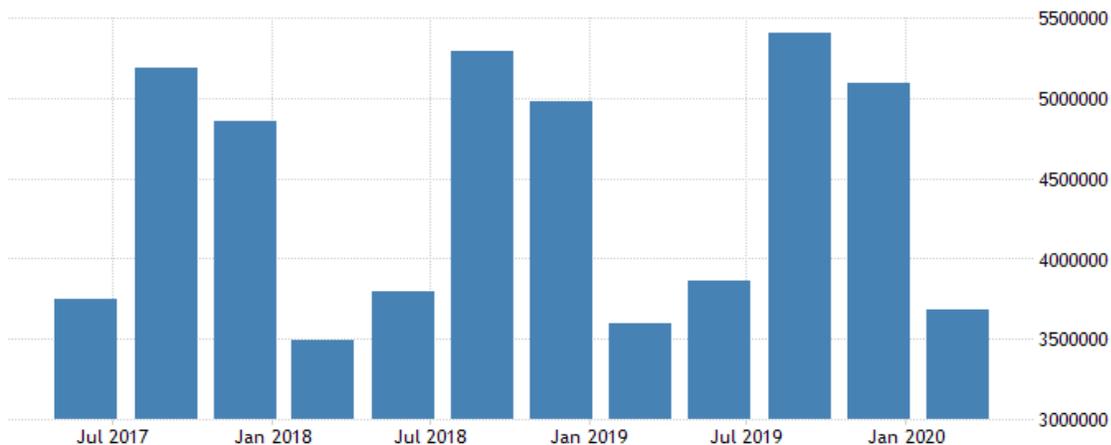
- **Weather** - unusual weather patterns, such as drought, a prolonged rainy season, early or late frosts and other factors can ruin crops and bring productivity down
- **The Capacity of a Given Farm** - soil can't be forced to produce beyond capacity, although there are methods that can be used to improve production capacity, such as proper fertilizing to add nutrients to the soil so that it can support more crops
- **Pests** occurred or not by certain weather conditions - in addition to spoiling crops, pests can add significantly to the costs of producing a crop. Controlling them may require measures such as fencing, chemical or biological treatments, companion planting or crop rotation, all of which change the ratio of inputs to outputs
- **Available Equipment** - in regions where access to mechanized farm equipment is low, agricultural productivity can also be low as people handle their crops primarily by hand. This involves a big investment of time, energy and money and also limits the total capacity of the land
- **The Supply and Demand in the Market** - farmers will adjust their activities to meet the needs of consumers and this can have an impact on agricultural productivity. In some cases,

governments even pay subsidies to farmers to compensate them for not growing crops, which can skew productivity measures.

For agricultural productivity, innovation is a key factor. If farmers want to increase their productivity, they need to farm smarter, by using farm management system. It helps them manage whole farm production, from tracking of activities on all fields, consumption of fertilizers, pesticides, work hours of workers and mechanization, to tracking of finances and complete farm analysis and reports. Investment in developing new farming techniques and in researching new approaches to farming need to be on a daily basis, Tanja (2020) concludes.

### **Agricultural Sector contribution to Nigeria GDP 2010 – 2020 Data**

GDP from Agriculture in Nigeria decreased to 3677153.49 NGN Million in the first quarter of 2020 from 5093983.13 NGN Million in the fourth quarter of 2019



SOURCE: TRADINGECONOMICS.COM | NATIONAL BUREAU OF STATISTICS, NIGERIA

**SOURCE: TRADINGECONOMICS.COM | NATIONAL BUREAU OF STATISTICS, NIGERIA.**

The contribution of Nigeria’s agricultural sector to the Gross Domestic Product (GDP) in the first quarter of 2020 was the sector’s highest first-quarter contribution in the last two years, data released by the National Bureau of Statistics (NBS, 2020) showed.

Figures released on Tuesday 28<sup>th</sup> July, 2020 showed that the sector in the first quarter of 2020 contributed 21.96 per cent to the nation’s GDP, which is the monetary value of all finished goods and services made in the country. The contribution is higher than 21.89 per cent and 21.66 per cent recorded in the first quarters of 2019 and 2018 respectively. If inflation is included, that is in nominal terms, agriculture contributed 20.88 per cent to nominal GDP in the first quarter of 2020. In real terms, Nigeria’s GDP for the first quarter of 2020 stood at N16.7 trillion, meaning agriculture generated about N3.7 trillion.

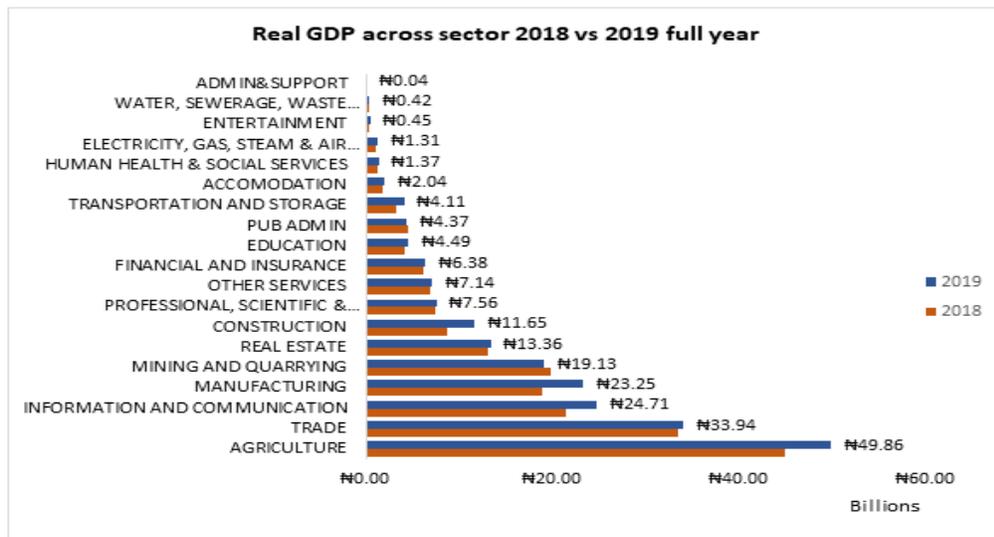
The NBS said in all, the non-oil sector contributed the largest chunk of 90.6 per cent to the economy. Other sectors that make up the non-oil sector as computed by the statistics bureau are industries and services, with services contributing the more than half.

In terms of growth rate, agriculture grew by 2.20 per cent in the first quarter of 2020 over the corresponding period in 2019, a decline since the first quarter of 2019 grew by 3.17 per cent over the previous year. The bureau said the sector declined by -27.81 per cent over the fourth quarter of 2019, partly due to seasonal impact on farming and the effect of the coronavirus pandemic.

As posited by NBS (2020), four sub-activities make up the agricultural sector, namely, crop production, livestock, forestry and fishing. According to the data, crop production remained the major driver of the sector, as it accounted for 90.54 per cent of overall nominal growth of the sector in the first quarter of 2020. Quarter on quarter, growth stood at -19.58 per cent in the first quarter of 2020. While crop production grew by 2.38 per cent in Q1 2020 from 3.26 per cent in Q1 2019, livestock grew by 0.63 per cent from 0.88 per cent in Q1 2019. Similarly, forestry grew by 1.71 per cent from 2.19 per cent in Q1 2019, while fishing grew by 1.49 or cent from 2.33 per cent in 7.09 per cent in Q1 2019.

In furtherance on year on year basis, reports as published by the National Bureau of Statistics (NBS, 2020), as contained in Ademola (2020), indicated that Nigeria Gross Domestic Product (GDP) at basic constant price (real GDP) grew by 2.27 per cent year-on-year (YoY) from N69.80 trillion in 2018 to N71.39 trillion in 2019 compared to 1.91 per cent in 2018. The growth was largely due to the contributions of the agricultural sector (N10.50 trillion), trade sector (N5.94 trillion) and the information and communication sector (N4.66 trillion) with 25.2 per cent, 16 per cent and 13 per cent shares of the total GDP respectively in 2019.

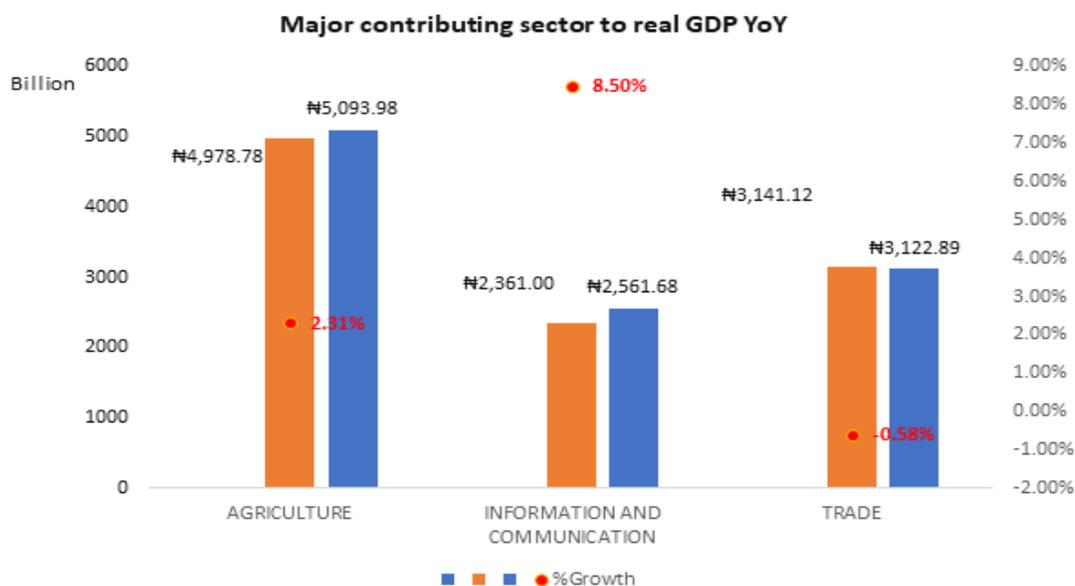
Similarly, the GDP grew by 2.55 per cent (YoY) in real terms in the fourth quarter (Q4) of 2019 to N707.57 billion compared to the N696.78 billion in Q4 2018 when it recorded a growth rate of 2.38 percent. This growth between the two periods which represents an increase of 0.17 per cent points and is largely because of the contribution of the three aforementioned sectors.



Source: NBS, BRIU

From the previous quarter (Q3 2019), a 5.59 percentage increase was also recorded in Q4 2019, whereas, only the agricultural sector from the three major sectors recorded a decline of 5.82 per cent with the remaining two having a significant 10.9 per cent (trade) and 22.2 percent (information & communication). The significant Q4 2019 growth rate also stood as the highest quarterly growth performance since the 2016 recession.

In nominal terms, the aggregate 2019 GDP grew by 12.90 per cent to N144.21 trillion from N127.74 trillion in the corresponding year; a major contribution from the agricultural sector (N31.90 trillion), trade sector (N22.51 trillion), manufacturing sector (N16.78 trillion), the information and communication sector (N15.40 trillion), as well as the mining and quarrying sector (N12.77 trillion).



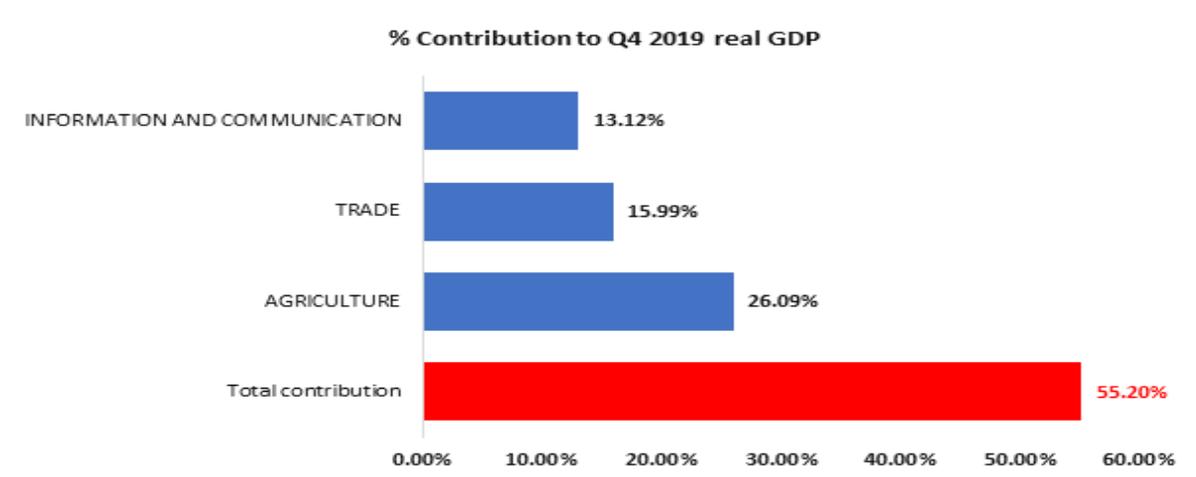
**Source: NBS, BRIU**

Of the five sectors, agriculture contributed about 22.12 per cent to the total nominal GDP in 2019. It was followed by trade, 15.61 per cent; manufacturing, 11.64 per cent; information and communication, 10.68 per cent, and 8.85 per cent mining and quarrying contribution to GDP.

In Q4 2019, aggregate GDP stood at N39.58 trillion in nominal terms. This was higher than the Q4 2018 which recorded an aggregate of N35.23 trillion, representing a YoY nominal growth rate of 12.34 per cent. This rate was down by 0.31 percentage points relative to the rate recorded in the Q4 2018 and -0.96 percentage points lower than the rate recorded in the preceding quarter.

On a quarter-on-quarter basis (QoQ), the nominal GDP increased by 4.68 per cent from N37.81 trillion in Q3 2019. However, only two out of the five sectors with major contribution recorded increase within Q3 and Q4 2019. Agricultural sector, manufacturing sector and mining and quarrying sector all recorded a decline of 5.40 per cent, 3.61 per cent and 27.25 per cent respectively between Q3 and Q4 2019.

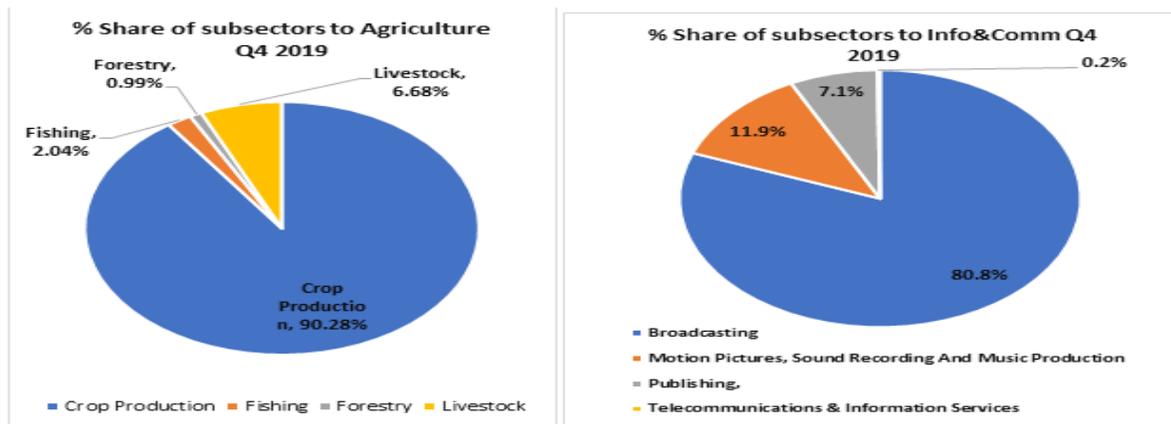
The agricultural sector alone contributed 26.09 per cent to the real GDP in Q4 2019 owing to the large contribution of “Crop Production”. This is followed by the trade sector with 15.99 per cent contribution while a 13.12 per cent contribution of the information and communication sector to total GDP was recorded in the same period owing to the growth in the “Broadcasting Subsector”. The real GDP of the three sectors jointly contributed 55.20 per cent to the total GDP in Q4 2019.



*Source: NBS, BRIU*

Of the three sectors, only the trade sector recorded a negative growth rate of -0.58 per cent in Q4 2019 real GDP compared to the corresponding year. Whereas, agriculture and information and communication were up by 2.31 per cent and 8.50 per cent in Q4 2019 YoY.

“Crop production” at 90.28 per cent was dominant in the agricultural sector while “Broadcasting” was dominant in the information and communication sector in the same quarter.



Source: NBS, BRIU

Since the Nigerian economy can be categorized into four main sectors: First, the real sector which comprises all the producing and consuming units of an economy. Second, the external sector which accounts for the transactions of the economy (consume or provide) with the rest of the world. Third is the government sector, that is, the public sector (central governments, the local governments, public corporations) which takes from the rest of the economy. Fourth, the monetary sector, that is, the deposit-taking institutions (banks), there is need to make or improve on policies to increase productivity as these sectors do not work in isolation of one another, rather they influence one another.

## 2.2 Theoretical Review

### Basic Reproduction Number ( $R_0$ )

The basic reproduction number ( $R_0$ ) is used to measure the transmission potential of a disease/virus. It is the average number of secondary infections produced by a typical case of an infection in a population where everyone is susceptible (Rothman *et al.*, 2013).

For example, if the  $R_0$  for a disease/virus, say coronavirus, in a population is 15, then we would expect each new case of coronavirus to produce 15 new secondary cases (assuming everyone around the case was susceptible).  $R_0$  excludes new cases produced by the secondary cases.

The basic reproductive number is affected by several factors:

- The rate of contacts in the host population.
- The probability of infection being transmitted during contact.
- The duration of infections mess.

In general, for an epidemic to occur in a susceptible population  $R_0$  must be  $> 1$ , so the number of cases is increasing (Rothman *et al.*, 2013). In many circumstances, not all contacts will be susceptible to infection. This is measured by the effective production rate ( $R$ ).

**Effective Reproduction Number (R)**

A population will rarely be totally susceptible to an infection in the real world. Some contacts will be immune, for example, due to prior infection which has conferred life-long immunity or as a result of previous immunization. Therefore, not all contacts will become infected and the average number of secondary cases per infections case will be lower than the basic reproduction number. The effective reproduction number (R) is the average number of secondary cases per infections case in a population made up of both susceptible and unsusceptible hosts. If  $R > 1$ , the number of cases will increase, such as at the start of an epidemic. Where  $R = 1$ , the disease is endemic, and where  $R < 1$  there will be a decline in the number of cases. The effective reproduction number can be estimated by the production of the basic reproductive number and the fraction of the host population that is susceptible (X). So,

$$R = R_0X$$

For example, if  $R_0$  for influenza is 12 in a population where half of the population is immune, the effective reproductive number for influenza is  $12 \times 0.5 = 6$ . Under these circumstances, a single case of influenza would produce an average of 6 new secondary cases (Rothman *et al.*, 2013). To successfully eliminate a disease/virus from a population, R needs to be less than 1.

**Clinical Attack Rates for Nigeria**

The table below illustrates the estimated number of symptomatic cases expected during a pandemic, based on either a 15% or 35% attack rate.

**Estimated Number of Symptomatic Cases by Outcome for Federal Republic of Nigeria**

**Estimated Number of Symptomatic Cases by Outcome Nigeria – Population 162,470,7372** (World Bank, World Development Indicators)

Outcome	15% Attack Rate	35% Attack Rate
Sick	24,370,611	56,864,758
Deaths (2.5%)	609,265	1,421,619
Hospitalizations (10%)	2,437,061	5,686,476
ICU (15% of Hospitalized)	365,559	852,971
Mechanical Ventilation (7.5% of Hospitalized)	182,780	426,486

Source: FRN (2013).

**Nigeria 2020 population is estimated at 206,139,589 people at mid-year 2020 according to UN Data**

Using this population (206, 139, 589), an estimation of the clinical attack rate of the virus for Nigeria, incorporating the World Bank rates, in addition to a 5% and 10% rates will give thus:

<b>Estimated Number of Symptomatic Cases by Outcome Nigeria – Population 206, 139, 589 (World Bank, World Development Indicators)</b>				
<b>Outcome</b>	<b>5% Attack Rate</b>	<b>10% Attack Rate</b>	<b>15% Attack Rate</b>	<b>35% Attack Rate</b>
Sick	10,306,979	20,613,958	30,920,938	72,148,856
Deaths (2.5%)	257,674	515,348	773,023	1,803,721
Hospitalizations (10%)	1,030,697	2,061,395	3,092,093	7,214,885
ICU (15% of Hospitalized)	154,604	309,209	473,813	1,082,232
Mechanical Ventilation (7.5% of Hospitalized)	77,302	154,604	231,906	541,116

**Source: Researchers' Estimation 2020 using World Development Indicators of the World Bank.**

### COVID-19 SITUATION REPORT 154

#### DATA AS REPORTED AND ACCURATE BY NIGERIA CENTRE FOR DISEASE CONTROL (NCDC) AS AT MIDNIGHT 31<sup>ST</sup> JULY, 2020

Sample Tested = 283,916 (4,241)      Confirmed Cases = 43,151 (462)

Discharge Cases = 19,565 (295)      Confirmed Fatalities = 879 (1) – 2.0% CFR

Affected States Including FCT = 37

DEMOGRAPHICS: Male = 27,932 (65%), Female = 15,219 (35%).

Most Affected Age Group: 31 – 40 (25%)

Persons of Interest = 11,197 (TOTAL)      11,084 (99% - Exceeded follow up).

PROVENANCE: Travel History = 804 (2%)      Contacts = 10,621 (25%)

Unknown Exposure = 31,726 (73%)

Global Updates: Total Number of Cases = 17,106,007 (668,910 Deaths)

Countries & Territories Affected = 214 Excluding the 2 international conveyance

### 2.3 Empirical Reviews

Studies of the macroeconomic effects of the SARS epidemic in 2003 found significant effects on economies through large reductions in consumption of various goods and services, an increase in business operating costs, and re-evaluation of country risks reflected in increased risk premiums. Shocks to other economies were transmitted according to the degree of the countries' exposure, or susceptibility, to the disease. Despite a relatively small number of cases and deaths, the global

costs were significant and not limited to the directly affected countries (Lee and McKibbin, 2003). Other studies of SARS include (Chou *et al.*, 2004) for Taiwan, (Hai *et al.*, 2004) for China and (Sui and Wong, 2004) for Hong Kong.

There are only a few studies of economic costs of large-scale outbreaks of infectious diseases to date: Schoenbaum (1987) is an example of an early analysis of the economic impact of influenza. Meltzer *et al.* (1999) examine the likely economic effects of the influenza pandemic in the US and evaluate several vaccine-based interventions. At a gross attack rate (i.e. the number of people contracting the virus out of the total population) of 15-35%, the number of influenza deaths is 89 – 207 thousand, and an estimated mean total economic impact for the US economy is \$73.1- \$166.5 billion.

Bloom *et al.*, (2005) use the Oxford economic forecasting model to estimate the potential economic impact of a pandemic resulting from the mutation of avian influenza strain. They assume a mild pandemic with a 20% attack rate and a 0.5 percent case-fatality rate, and a consumption shock of 3%. Scenarios include two-quarters of demand contraction only in Asia (combined effect 2.6% Asian GDP or US\$113.2 billion); a longer-term shock with a longer outbreak and larger shock to consumption and export yields a loss of 6.5% of GDP (US\$282.7 billion). Global GDP is reduced by 0.6%, global trade of goods and services contracts by \$2.5 trillion (14%). Open economies are more vulnerable to international shocks.

Another study by the US Congressional Budget Office (2005) examined two scenarios of pandemic influenza for the United States. A mild scenario with an attack rate of 20% and a case fatality rate (i.e. the number who die relative to the number infected) of 0.1% and a more severe scenario with an attack rate of 30% and a case fatality rate of 2.5%. The CBO (2005) study finds a GDP contraction for the United States of 1.5% for the mild scenario and 5% of GDP for the severe scenario.

McKibbin and Sidorenko (2006) used an earlier vintage of the model used in the current paper to explore four different pandemic influenza scenarios. They considered a “mild” scenario in which the pandemic is similar to the 1968-69 Hong Kong Flu; a “moderate” scenario which is similar to the Asian flu of 1957; a “severe” scenario based on the Spanish flu of 1918-1919 ((lower estimate of the case fatality rate), and an “ultra” scenario similar to Spanish flu 1918-19 but with upper-middle estimates of the case fatality rate. They found costs to the global economy of between \$US300 million and \$US4.4trillion dollars for the scenarios considered.

### **3. MATERIALS AND METHODS**

#### **3.1 Area of study**

The study was carried out in the Southeast of Nigeria. The zone is located on latitudes 5006’N to 6034’N of the Equator and longitudes 6038’E and 8008’E of the Greenwich (Prime) Meridian (Microsoft Corporation, 2009). The southeast covers Anambra, Imo, Ebonyi, Abia and Enugu States. The zone is bounded in the east by Rivers and Cross-River states, in the north by Benue state, west by Edo and Delta states and in the south by Akwa Ibom state. The zone has tropical climate (hot and warm), all the year round. It has high temperature with annual daily minimum temperature of 24oC, its relative humidity is lowest during harmattan (Dec, Jan and Feb). Rainy

season starts from March to late October and dry season sets in from November to February (Nwogu, 2003; Akoroda, 2005 in Umeh *et al.*, 2015).

The target population of the study is farmers in the study area as well as the extension agents assigned to the selected areas.

### 3.2 Sampling Procedure and Data Collection

For this study, we explored the e-survey multi-stage sampling techniques of data collection, which is otherwise, referred to as electronic data collection method (Mohini and Stephen, 2006; Wilson and Staton, 2005). We define an electronic survey as one in which a computer plays a major role in both the *delivery* of a survey to potential respondents and the *collection* of survey data from actual respondents (Jansen *et al.*, 2007). Perhaps the three most common reasons for choosing an e-survey over traditional paper-and-pencil approaches are (1) decreased costs, (2) faster response times, and (3) increased response rates (Lazar & Preece, 1999; Oppermann, 1995; Saris, 1991); the researchers added the pandemic situation currently ravaging nations of the world with various containing and curtailing measures – physical distancing, lockdown, restricted movement, among others, as another obvious reason why e-survey techniques can be deemed appropriate in this study.

The researchers explored the targeted states ADPs' communication/social media platforms to register their study and its essence through the states' CEOs. The Zonal extension officers and Blocks extension supervisors; together with the representatives of farmers associations operational in the considered zones/states constituting the study area, and the agricultural extension agents, were held to an interactive session using available social media platforms, to share information related to their areas, zones and states; and the COVID-19 situation in each of their states. Researchers held group discussion via online messaging and conferencing platforms (Email, WhatsApp, Telegram, and Zoom). The instrument for data collection was provided for these representatives and extension agents for purposeful sampling using their various associations/groups platforms (Email, WhatsApp, Telegram), which serves as the point-of-contact, to get farmers' (respondents') responses to the questions as contained in the questionnaires. The representatives and extension agents were educated by the researchers on how the questionnaires can be filled by respondents. The questionnaire used five points scale of Strongly Agreed (SA), Agreed (A), Neutral (N), Strongly Disagreed (SD), Disagreed (D).

SA = 5, A = 4, N = 3, SD = 2 and D = 1.

### 3.3 Sampling Size Determination

Data for this study were collected from both primary and secondary sources. Primary data was collected with the aid of two sets of well-structured pre-tested questionnaires. A set was administered on ADP extension staff and representatives of farmers associations; while the other was administered on the farmers. Information gathered was used to corroborate or crosscheck the data from secondary sources.

Secondary data was collected from the Programme Monitoring and Evaluation Unit of the Agricultural Development Programme (ADP) of the states' ADPs under study.

Following Umeh *et al.*, 2015, with some modifications by the researchers, an e-survey multi-stage sampling technique was adopted for the selection of respondents for the study. First, five

state ADPs namely Abia, Imo, Anambra, Enugu and Ebonyi states were purposefully selected to represent the study area. The second stage involved purposive selection of the Chief Extension Officers (CEOs) or Directors of Extension Services and Zonal Extension Officers (ZEOs) of the selected state ADPs. The third stage involved random selection of 30 Block Extension Supervisors (BESs) comprising of two from each zone. The fourth stage involved random selection of 45 Extension Agents (3 from each zone) from each of the state ADP, under study. The fifth stage also involved random selection of 30 farmers (10 from each of the 3 zones of each state) from the state ADPs under study.

The sample size for the study therefore was made up of 1 CEO, 3 ZEOs, 6 BESs, 15 EAs, and 30 farmers for each of the five (5) Southeast States - Abia, Imo, Anambra, Enugu and Ebonyi states.

**Total Respondents Computation:**

CEO -  $1 \times 5 = 5$

ZEOs -  $3 \times 5 = 15$

BESs -  $6 \times 5 = 30$

EAs -  $15 \times 5 = 45$

Farmers  $30 \times 5 = 150$

**Total Respondents = 245 Respondents**

**3.4 Method of Data Analysis**

The data collected for the study was presented in a tabular form. The data was analyzed using the mean, standard deviation and the paired sample statistics as statistical tools. While the mean and standard deviation was used to answer the research questions, the paired sample test was used to test the hypothesis to find out if the variables of the study have significant effects at 0.05 significant levels. The conditions of each of the explanatory variables before the outbreak of the COVID-19 Pandemic was used as a control against the results due to the pandemic, in the paired sample statistics.

The research questions were answered using the following boundary limits for interpreting value of items in order to answer the research questions.

Strongly Agreed (SA) = 5 4.5 5.00  $\Rightarrow$  Very High Extent

Agreed (A) = 4 3.5 4.49  $\Rightarrow$  High Extent

Neutral (N) = 3 2.5 3.49  $\Rightarrow$  Moderate Extent

Disagreed (D) = 2 1.5 2.49  $\Rightarrow$  Low Extent

Strongly Disagreed (SD) = 1 0.5 1.49  $\Rightarrow$  Very Low Extent

$$\text{Mean} = X = \frac{\sum fx}{N} \quad (\text{For Research Questions})$$

$$\text{Five point response scale} = \frac{5 + 4 + 3 + 2 + 1}{5} = \frac{15}{3} = 3:0$$

Considering the five items structured questionnaire used for this study, the boundary limits for interpreting value of items in order to answer the research questions becomes:

- Strongly Agreed (SA) = 25    22.5    25.00     $\Rightarrow$  Very High Extent
- Agreed (A) = 20    17.5    22.45     $\Rightarrow$  High Extent
- Neutral (N) = 15    12.5    17.45     $\Rightarrow$  Moderate Extent
- Disagreed (D) = 10    7.5    12.45     $\Rightarrow$  Low Extent
- Strongly Disagreed (SD) = 5    2.5    7.45     $\Rightarrow$  Very Low Extent

**Decision Rule:** Base on five points Likert Scale which was used to analyze the data, any item that has a mean of 15.0 and above is accepted while any item less than 15.0 is rejected.

**3.5 Variables Description:**

- AGPRO = Agricultural Productivity in Nigeria.
- NGRFX = Nigeria’s foreign exchange earnings through Agricultural produce exportation.
- FRNEN = Nigerian farmers’ earnings
- ECGRW = Economic greatness potentials of the Nigerian Agricultural sector.
- COVID-19 = The effects of COVID-19 pandemic.

**4. RESULTS**

**4.1 Questionnaire Reliability**

Reliability of the data was assessed using the Cronbach’s Alpha Coefficient (a) which is one of the most frequently used measures of internal consistency of instruments. The majority of authors consider that Cronbach’s Alpha should not drop below 0.7 and that an alpha value of 0.7 or more signifies reliable measures (Bryman and Bell, 2011).

Reliability Statistics		
Cronbach's Alpha <sup>a</sup>	Cronbach's Alpha Based on Standardized Items <sup>a</sup>	N of Items
.875	.838	6

Source: SPSS Output 2020.

The value of Cronbach’s Alpha derived from the analysis is 0.875. Therefore, the instrument developed for evaluating the economic potentials of COVID-19 on the Nigerian Agricultural Sector; as well as the impact of COVID-19 pandemic on the Nigerian Agricultural sector, was considered to be reliable.

**4.2 Research Questions**

**Research Question One:** To what extent has Agricultural productivity in Nigeria been affected by COVID-19 pandemic?

Respondents’ mean rating on the extent Agricultural productivity in Nigeria has been affected by COVID-19 pandemic. N = 245.

**Case Processing Summary**

	Cases					
	Included		Excluded		Total	
	N	Percent	N	Percent	N	Percent
AGPRO * GENDER	245	100.0%	0	0.0%	245	100.0%

**Report**

AGPRO

GENDER	Mean	N	Std. Deviation	Minimum	Maximum
MALE	23.13	127	1.654	20	25
FEMALE	22.82	118	1.861	20	25
Total	22.98	245	1.760	20	25

Source: SPSS Output 2020.

**Decision:** The result, as presented in the case processing summary table above, revealed that all the respondents were included in the study (N = 245). From the mean test report table, the minimum mean = 20, whereas the maximum mean = 25. The overall mean is 22.98, with a standard deviation of 1.760. The mean value falls within the boundary limit of SA, which implies very high extent. The study therefore indicated that Agricultural productivity in Nigeria has been affected by COVID-19 pandemic to a very high extent.

**Research Question Two:** How has Nigeria’s foreign exchange earnings through Agricultural Produce exportation been affected by COVID-19 pandemic?

Respondents’ mean rating on the extent Nigeria’s foreign exchange earnings through Agricultural Produce exportation has been affected by COVID-19 pandemic. N = 245.

**Case Processing Summary**

	Cases					
	Included		Excluded		Total	
	N	Percent	N	Percent	N	Percent
NGRFX * GENDER	245	100.0%	0	0.0%	245	100.0%

**Report**

NGRFX

GENDER	Mean	N	Std. Deviation	Minimum	Maximum
MALE	22.43	127	1.828	20	25
FEMALE	22.48	118	1.889	19	25
Total	22.46	245	1.854	19	25

**Source:** SPSS Output 2020.

**Decision:** The result as presented in the case processing summary table above, revealed that all the respondents were included in the study (N = 245). From the mean test report table, the minimum mean = 19, whereas the maximum mean = 25. The overall mean of all the items was 22.46 with SA = 1.854. The mean value fall within the boundary limit of A, which implies High extent. The study therefore indicated that Nigeria’s foreign exchange earnings through Agricultural Produce exportation has been affected by COVID-19 Pandemic to a high extent.

**Research Question Three:** To what extent has the earnings of Nigerian farmers been affected by COVID-19 Pandemic?

Respondents’ mean rating on the extent the earnings of Nigerian farmers have been affected by COVID-19 Pandemic. N = 245.

**Case Processing Summary**

	Cases					
	Included		Excluded		Total	
	N	Percent	N	Percent	N	Percent
FRMEN * GENDER	245	100.0%	0	0.0%	245	100.0%

**Report**

FRMEN

GENDER	Mean	N	Std. Deviation	Minimum	Maximum
MALE	22.28	127	1.772	18	25
FEMALE	22.07	118	1.584	18	25
Total	22.18	245	1.684	18	25

**Source:** SPSS Output 2020.

**Decision:** The result, as presented in the case processing summary showed that all the respondents were included in the study (N =245). From the mean test report table, the minimum mean = 18, whereas the maximum mean = 25. The overall mean (total) of all the items was 22.18, with SD = 1.684. The mean value falls within the boundary limit of A, which implies High Extent. The study therefore indicated that the earning of the Nigerian farmer have been affected by COVID-19 Pandemic to a high extent.

**Research Question Four:** How has the economic greatness potentials of the Nigerian Agricultural sector been influenced by COVID-19 Pandemic?

Respondents’ mean rating on the extent economic greatness potentials of the Nigerian Agricultural sector has been influenced by COVID-19 Pandemic. N = 245.

**Case Processing Summary**

	Cases					
	Included		Excluded		Total	
	N	Percent	N	Percent	N	Percent
ECGRW * GENDER	245	100.0%	0	0.0%	245	100.0%

**Report**

ECGRW

GENDER	Mean	N	Std. Deviation	Minimum	Maximum
MALE	22.27	127	1.659	19	25
FEMALE	22.17	118	1.731	19	25
Total	22.22	245	1.691	19	25

Source: SPSS Output 2020.

**Decision:** From the case processing summary table above, the result showed that all the respondents were included in the study (N = 245). The mean test report table gave the minimum mean value to be 19, whereas the maximum mean = 25. The total/overall mean value is 22.22 with the SD = 1.691. The mean value falls within the boundary limit of A, which implies High Extent. The study therefore indicated that the Economic potential of the Nigerian Agricultural sector has been influenced by COVID-19 Pandemic to a high extent.

**Research Question Five:** To what extent have government policies in response to COVID-19 affected Agricultural sector's contribution to economic recovery and growth?

Respondents' mean rating on the extent government policies in response to COVID-19 have affected Agricultural sector's contribution to economic recovery and growth. N = 245.

**Case Processing Summary**

	Cases					
	Included		Excluded		Total	
	N	Percent	N	Percent	N	Percent
GOPOL * GENDER	245	100.0%	0	0.0%	245	100.0%

**Report**

GOPOL

GENDER	Mean	N	Std. Deviation	Minimum	Maximum
MALE	21.50	127	2.377	17	25
FEMALE	21.95	118	2.324	17	25
Total	21.72	245	2.357	17	25

Source: SPSS Output 2020.

**Decision:** From the case processing summary table above, the result showed that all the respondents were included in the study (N = 245). The mean test report table gave the minimum mean to be 17, whereas the maximum mean = 25. The total mean value is 21.72, with the SD = 2.257. The mean value falls within the boundary limit of A, which implies high extent. The study therefore indicated that government policies in response to COVID-19 Pandemic have affected Agricultural sector contribution to Nigeria's economic recovery and growth to a high extent.

### 4.3 Hypotheses Testing Using Paired Sample Test

**Hypothesis One:** Agricultural productivity in Nigeria (AGPRO) is not significantly affected by COVID-19 pandemic.

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	COVID19	22.55	245	1.773	.113
	AGPRO	22.98	245	1.760	.112

		Paired Differences				t	df	Sig. (2-tailed)	
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower				Upper
Pair 1	COVID19 - AGPRO	-.433	2.646	.169	-.766	-.100	-2.560	244	.011

Source: SPSS Output 2020.

**Interpretation of Result:** Since the  $P$ -value (0.011) is less than the significance level (0.05), we cannot accept the null hypothesis.

At 5% level of significance, from the sample data, there is sufficient evidence to conclude that Agricultural Productivity in Nigeria, on average, is lower as a result of COVID-19 pandemic. COVID-19 pandemic appears to be effective in reducing productivity.

Also, the  $t$ -value of -2.560 indicates a negative significant effect of COVID-19 on Agricultural productivity in Nigeria.

**Hypothesis Two:** Nigeria's foreign exchange earnings through Agricultural Produce exportation (NGRFX) are not significantly affected by COVID-19 pandemic

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	COVID19	22.55	245	1.773	.113
	NGRFX	22.46	245	1.854	.118

		Paired Differences				t	df	Sig. (2-tailed)	
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower				Upper
Pair 1	COVID19 - NGRFX	.094	2.614	.167	-.235	.423	.562	244	.574

Source: SPSS Output 2020.

**Interpretation of Result:** Since the  $P$ -value (0.574) is greater than the significance level (0.05), we cannot reject the null hypothesis.

At a 5% level of significance, from the sample data, there is sufficient evidence to conclude that Nigeria's foreign exchange earnings through Agricultural produce exportation, on average, are not affected as a result of COVID-19 pandemic.

COVID-19 pandemic, on the average, appears not to be effective in reducing Nigeria’s foreign exchange earnings through the exportation of Agricultural produce.

Also, the t-value of 0.562 indicated the existence of a positive insignificant effect.

**Hypothesis Three:** The earnings of Nigerian farmers (FRMEN) is not significantly affected by COVID-19 Pandemic.

**Paired Samples Statistics**

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	COVID19	22.55	245	1.773	.113
	FRMEN	22.18	245	1.684	.108

**Paired Samples Test**

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	COVID19 - FRMEN	.371	2.391	.153	.071	.672	2.431	244	.016

Source: SPSS Output 2020.

**Interpretation of Result:** Since the *P*-value (0.016) is less than the significance level (0.05), we cannot accept the null hypothesis.

At a 5% level of significance, from the sample data, there is sufficient evidence to conclude that the earnings of Nigerian farmers, on average, are affected as a result of COVID-19 pandemic. COVID-19 pandemic, on average, appears to be effective in affecting the Nigerian farmers’ earnings.

Also, the t-value of 2.431 indicates the existence of a positive significant effect.

**Hypothesis Four:** Economic greatness potentials of the Nigerian Agricultural sector (ECGRW) has not been significantly influenced by COVID-19 Pandemic.

**Paired Samples Statistics**

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	COVID19	22.55	245	1.773	.113
	ECGRW	22.22	245	1.691	.108

**Paired Samples Test**

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	COVID19 - ECGRW	.331	2.525	.161	.013	.648	2.049	244	.042

Source: SPSS Output 2020.

**Interpretation of Result:** Since the *P*-value (0.042) is less than the significance level (0.05), we cannot accept the null hypothesis.

At a 5% level of significance, from the sample data, there is sufficient evidence to conclude that the Economic greatness potentials of the Nigerian Agricultural sector, on average, is affected/influenced as a result of COVID-19 pandemic. COVID-19 pandemic, on average, appears to be effective in influencing the Economic greatness potentials of the Nigerian Agricultural sector.

Also, the *t*-value of 2.049 indicates the existence of a positive significant influence.

The pandemic led to intensive agricultural research, encourage farmers to diversify and produce a wider range of food. It strengthen collaboration among the public-health, food and agricultural sectors. Agricultural research is believed to play a vital role in transforming the Nigerian food systems and making them more sustainable and resilient. Also, there has been a witnessed increase in the number of Nigerians that returned to farming since the pandemic both on subsistence and commercial farming, which is believed to result in increased sector’s yield.

**Hypothesis Five:** Nigerian government policies (GOPOL) in response to COVID-19 has no significant effect on agricultural sector’s contribution to economic recovery and growth.

**Paired Samples Statistics**

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	COVID19	22.55	245	1.773	.113
	GOPOL	21.72	245	2.357	.151

**Paired Samples Test**

		Paired Differences					<i>t</i>	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	COVID19 - GOPOL	.833	3.070	.196	.446	1.219	4.245	244	.000

**Source:** SPSS Output 2020.

**Interpretation of Result:** Since the *P*-value (0.000) is less than the significance level (0.05), we cannot accept the null hypothesis.

At a 5% level of significance, from the sample data, there is sufficient evidence to conclude that the Nigerian Government Policies in response to COVID-19 pandemic, on average, has significant effect on agricultural sector’s contribution to Nigeria’s economic recovery and growth. The policies of the Nigerian government, on average, appears to be effective in enhancing agricultural sector’s contribution to economic recovery and growth.

Also, the *t*-value 4.245 indicates the existence of a positive significant effect of the policies.

At the flag-off of the intervention policies of the Nigerian government on COVID-19 effect on agricultural sectors' yield in 29<sup>th</sup> May 2020, farmers in 13 states of Nigeria received improved seeds of sorghum, pearl millet, cowpea and rice as part of an initiative to cushion the pandemic's impact on food system. A host of agricultural research institutes and programmes, led by ICRISAT, and the Nigerian government recently launched the seed support initiatives.

Observably, the Nigerian government came up with plans ahead, with research institutions to produce breeder and foundation seeds for production of high yielding seeds for 2020 wet and dry season, as well as 2021 rainy season. Agricultural grants to Nigerian farmers, among others, was also part of the policies of the Nigerian government to enhance sector's contribution.

**5.1 Conclusion:** From the findings of the study, we conclude that the economic greatness potentials of the Nigerian Agricultural sector have been positively influenced by COVID-19 pandemic, as evidenced in the nation's investment and obtained results in research and development; and the witnessed increase in Nigerian farmers during the pandemic, both at the subsistence and commercial levels, with promised year yield. Also, the pandemic is found to exert negative significant effect on Nigeria's Agricultural productivity; a positive significant effect on the earnings of Nigerian farmers; and no significant effect on Nigeria's foreign exchange earnings through agricultural produce exportation. The findings also revealed the effectiveness of Nigerian government policies in response to COVID-19, on Agricultural sector's contribution to economic recovery and growth.

**5.2 Recommendation:** On the basis of the findings of the study, we made the following recommendations:

1. Government policies and intervention programmes to enhance agricultural productivity in Nigeria should be pursued by the Nigerian government and sustained; with adequate feedback mechanism being set-up to ensure that these programmes are not jeopardized or subverted; as evidenced in past programmes of the government, where such programmes are marred by corruption and opaque accountability.
2. Effective supply chain, as it relates to agricultural produce exportation should be invigorated, as well as the establishment of adequate supply and distributive channels at the local levels for the marketability of farm produce.
3. The Nigerian government, its agencies and institutions; together with the Nigerian farmers, should sustain the economic greatness potentials which the pandemic brought to limelight in the sector; and in furtherance, explore research and development as a panacea to mitigating agricultural productivity challenges in Nigeria.

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