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FOOD PRICES, SECURITY AND SUSTAINABILITY UNDER COVID-19 LOCKDOWN IN NIGERIA: A CASE OF RAW GROUNGNUT IN AKURE METROPOLIS, ONDO STATE

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Abstract

This paper evaluated the effect of covid-19 on food security in Nigeria by using groundnut as case study. The study examined the variation in price of raw groundnut before, during and after covid-19 lockdown and assessed the effect of the lockdown on the price, accessibility and availability of raw groundnut in the study area. Survey design, purposive, proportionate stratified and random sampling techniques were used to select the respondents from four major markets (Oja Oba, Isikan, Odopetu and Osolo markets) within Akure Metropolis. Data were collected with structured questionnaire and personal interview and analyzed with descriptive statistic (trend analysis and mean average). The hypothesis was tested with Analysis of Variance (ANOVA). The study revealed that there was a significant difference in the price of raw groundnut before and after the lockdown, the price of groundnut upturn by 11.11% as soon as COVID-19 lockdown was implemented, remained high for about four months after the lockdown and reduced thereafter as a result of low purchasing power, eased movement and reduced transportation cost. The paper recommends concerted government policy options, plans and strategies to assist in cushioning the effect of pandemic on the price of raw groundnut and make raw groundnut readily accessible and affordable during any pandemic in especially in Ondo State and Nigeria in general, so that food insecurity is prevented and food sustainability is attained.

Keywords: Food Security; Food Sustainability; Lockdown; Groundnut

JEL Classification Codes: *L66, E5, Q53.*

1. INTRODUCTION

The Pandemic "Coronavirus (COVID-19)" was alien to Nigerians before March 2020. Nevertheless, several cases of pneumonia were recorded in the Hubei region of Wuhan in China, in December 2019 (Mazur, Dang & Vega, 2020; Tan, Zhao, Ma, Wang, Niu, Xu, … Wu, 2020; Albulescu, 2020; Salisu, Akanni & Raheem, 2020), and this illness was later recognised to be Coronavirus (Tan *et al*., 2020). In March 2020, the virus spread to the entire world, and on March 11th 2020, the World Health Organisation (WHO) declared a state of a pandemic (Laguna, Fiszman, Puerta, Chaya & Tárrega, 2020) in the entire globe. The economic effect of COVID-19 was already noticeable after three months of its outbreak, Sub-Saharan Africa's economic growth was anticipated to flip-flop from +2.4% in the year 2019 to between –2.1 and –

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5.1% in 2020, and thus, declaring the first recession of the region in over two decades (Calderon, Kambou, Djiofack, Kubota, Korman & Canales, 2020).

The pandemic left a lot of people in bewilderment and fear. There was a feeling of uncertainty and lots of concern about what the looming predicament will lead to (Laguna *et al*., 2020). Then came the announcement of a total lockdown, other restrictions and social distancing. The situation led to restriction in traveling, shutting up of informal and formal markets, falling incomes, stillness in a lot of countries' economies (Cardwell & Ghazalian, 2020), changes in people's life style, travelling and purchasing pattern in the world and Nigeria inclusive. The lockdown triggered panic food purchasing and stocking of huge quantity of food by a lot of people in several countries (Pu & Zhong, 2020; Yao, Zuo, Zuo, Lin, Huang and Zang, 2020). Hence, (Yao *et al*., 2020) cautioned that if the swift blowout of the epidemic is not effectively checked, the world's food problem is anticipated to turn out to be more pronounced in the forthcoming months.

Supply chains were being affected by the stress from the lockdown, this slowed down transportation and production activities and in consequence, there was a swift rise in the world's food prices (Yao *et al*., 2020). Some countries started to put into consideration, export restrictions (International Food Policy Research Institute (IFPRI), 2020). While the International Food Policy Research Institute (IFPRI), Food and Agriculture Organization (FAO), the World Food Programme (WFP) and some other international organizations ordered that the world food trade be kept opened (Pu & Zhong, 2020).

The traditional offline sales channels became inefficient or censored, the channel of distribution of goods were broken as a result of logistics restriction, the traditional urban sales channels were shut down, in consequence, there was failure of buyers to make planned purchases. Thus, the quantity of agricultural products' being marketed deeply reduced (Pu & Zhong, 2020). The lockdown coupled with the downturn economy (Torero, 2020), positioned the food system under risk like never before and resulted to an upsurge in the number of people under hunger, malnutrition and poverty (World Food Programme (WFP), 2020). In this regard, the Food Security Information Network (FSIN), (2020) stated that the number of persons facing severe hunger due to the COVID-19 pandemic, could increase by approximately 130 million in 2020 and people would not have adequate capability to make provisional relief to those who have lost income (Cardwell & Ghazalian, 2020). This can result to poverty and hunger which are the second and third Sustainable Development Goals (SDGs) targeted to end by the year 2030 by the United Nations (UN, 2015).

In addition, Udmale, Pal, Szabo, Pramanik & Large (2020) projected that Covid-19 pandemics will sternly affect countries with lower -income than other countries. This is worrisome for African countries especially Nigeria which the United Nations Development Programme's (UNDP) (2019)'s Human Development Report, already disclosed that its poverty rate is 64%, and Human Development Index is 152. In fact, food insecurity has continued to be dominant in West Africa, and during 2009–2018, the figure of undernourished people in West Africa (Nigeria included) nearly doubled from 32 to 56 million, meaning that 15% of the West African population is undernourished, while all over the world, the percentage reduced from 842

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to 822 million (Food and Agricultural Organization (FAO), International Fund for Agricultural Development (IFAD), United Nations Children's Fund UNICEF, World Food Programme (WFP), World Health Organisation (WHO), 2019).

Groundnut is a staple food eaten by Nigerians almost on daily bases. This shows the importance of accessibility and availability of this grain in the attainment of food security and sustainability in Nigeria. Most of the raw groundnut being sold in Akure metropolis, Ondo State States' markets are purchased in Mokwa, Niger State, Nigeria. COVID-19 pandemic restricted the mobility of people and goods including grains greatly, within and across states in Nigeria.

Lockdown due to COVID-19 pandemic was made known by federal government of Nigeria on the 30th of March 2020. The government announced that there will be 14 days lockdown from Monday the 27th of April 2020, and also declared a curfew from 8pm to 6am. On the 2nd of May, federal government announced the gradual easing up of lockdown. The government further extended the lockdown on Monday the 29th of June 2020 by 4 weeks with effect from 1st of July 2020 to 27th of July 2020. Nevertheless, the government permitted interstate movement outside curfew hours. The 2nd phase of the easing of lockdown was again extended by one week and another 4 weeks (Oyekanmi, 2020).

Food insecurity takes place when problems arise at any level in the food production-consumption chain (Expert Panel, 1990). Thus, every time there is food that is adequate in nutrition and the food is safe, or the capability and method of acquiring the food is socially acceptable but uncertain or limited, then there is food insecurity (Expert Panel, 1990). Hence, food insecurity can also take place, when there is an accessibility and availability of food, nonetheless the food cannot be consumed due to some physical and other limitations that can result from constraint relating to disability, physical functioning or elderly (National Research Council, 2006). The opposite of food insecurity is food security. The system that makes sure that food nutrition and food security takes place for everybody in such a manner that the environmental, social and economic bases to produce food and nutrition for forthcoming generations are not compromised, is referred to as a sustainable food system. High Level Panel of Experts (HLPE), 2014).

Several studies have been carried out on the impact of COVID-19 pandemic on numerous aspects of life and industries in several countries in the globe. Some of these studies include: COVID-19 implications on household income and food security in Kenya and Uganda (Kansiime, Tambo, Mugambi, Bundi, Kara & Owuor, 2020); Caring more about food: the unexpected positive effect of the Covid-19 lockdown on household food management and waste (Principato, Secondi, Cicatiello & Mattia, 2020); impact of COVID-19 lockdown on food priorities - results from a preliminary study using social media and an online survey with Spanish consumers (Laguna *et al*., 2020); A novel coronavirus genome identified in a cluster of pneumonia cases—Wuhan, China (Tan *et al*., 2020) and Rising concerns over agricultural production as COVID-19 spreads: Lessons from China (Pu & Zhong, 2020).

However, researches on the effect of COVID-19 on the prices of food (using raw groundnut as case study), food security and sustainability of the people of Ondo State in

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particular and Nigerians in general, are scarce. This study was carried out to fill this gap by examining the variations in prices of raw groundnut before, during and after covid-19 lockdown in Nigeria and assess the effect of the lockdown on the prices of these grains in the study area, and propose policy options, plans and strategies to assist in cushioning the effect of pandemic on making these grains readily available accessible and affordable during any pandemic in Ondo State particularly and Nigeria in general in order to prevent food insecurity and attain food sustainability.

The theory that supports this study is the classical supply and demand theory. Cited in Whelan and Msefer (1996), the theory assumes that the market is perfectly competitive with free entry and exit. The market comprises rational consumers, and every factor exclusive of price which affect the quantity of sold and purchased goods are held constant. Supply and demand are reliant on price. Therefore, the higher the prices of goods, the lower the demand for the goods, however, the higher the price, the higher supplied quantity and the higher the revenue of the sellers. This theory is associated with this study because, COVID-19 lockdown led to the scarcity and decline in supply of goods into the market, in consequence, there was an upturn in prices and reduction in demand for these goods.

2. LITERATURE REVIEW

2.1 Conceptual Review on effects of COVID-19 on Various aspects of life and business Activities, Food Security and Food Sustainability

2.1.1 Effects of COVID-19 on Shopping

The outbreak of COVID-19 resulted in a decrease in shopping frequency, and the products that were purchased with higher frequency were vegetables (health motivations), pasta, and other types of foods like chocolates, cheese and nuts which were purchased to improve shoppers' mood. Also, the purchase of products with short shelf-life like seafood and fish, also Soft drinks, Snacks, decreased, while the purchase of food that contribute to body weight gain and viewed as unhealthy like sugary bakery foods or mood (desserts) were reduced (Laguna *et al*., 2020).

2.1.2 Effects of COVID-19 on Demand, Inputs for Agricultural, Business Activities, Mobility, Labour, Job Loss, Purchasing Power, Prices, Food Security, Quality of life

Continuation of COVID-19 pandemic and its resultant lockdown and restrictions in mobility will result in making the production of local rice to reduce due to shortage of inputs, labour (since the traditional mills are mainly operated by family members or individuals workers may find it difficult to travel to other regions or to and from the mill), costs and cause high rate of death (Arouna *et al*., 2020). Restriction in the movement of people led to labour scarcity and lessened production efficiency (Pu & Zhong, 2020). A lot of farm service providers stopped working as a result of fear of the virus or traffic restrictions (Wei and Lu, 2020).

Haroon and Rizvi (2020) disclosed that COVID-19's news coverage resulted to shifts in unpredictability with the toughest effect on travel & leisure, automobile, transportation and energy and industries. The main risk associated with the pandemic is that if a single member of

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staff should contaminate it, this may lead to a complete lockdown of the facilities and this can result in provisional unemployment (Arouna *et al*., 2020). The prevention of China from importing soybeans due to the outbreak of the pandemic will necessitate the China to increase the planting of soybean area by 6.9 times in order to satisfy the citizens' demands, and the cereal's self-sufficiency rate will drop to 63.4%. This will hugely affect China's food security because, if soybean imports reduce, inadequate soybeans supply will affect people's quality of life (Yao *et al*., 2020). Unnecessary restrictions of movement during the pandemic would hinder necessary production inputs block the channels of outflow of agricultural products, hamper essential production inputs, destroy production cycles and weaken production capacity (Pu & Zhong, 2020). The lockdown will lead to immense jobs loss which will decrease the consumers' purchasing power and demand, and threaten the food security of families (Cardwell & Ghazalian, 2020; Arouna *et al*., 2020). West Africa is labour intensive, the lockdowns may hinder access to labour and farmers' access to inputs such as fertilizer, seeds, pesticides, and technical know-how, which will affect production negatively (Arouna *et al.*, 2020). The Production plans for exporting countries' fertilizer during the lockdowns will be dislocated or delayed, and the movement of intermediate inputs like fertilizers and pesticides will slow down.

Thus, local input dealers may face stumbling blocks in procuring insecticides and fertilizers and this can lead to shortage in the supply of intermediate inputs and higher purchase prices (Arouna *et al*., 2020). The lockdown prevented some grain-producing areas in Southeastern coastal provinces in China from planting crops on time, this resulted in reducing production and production efficiency, inadequate supply of agricultural products, rising prices, and inadequate food supply which could threaten food security (Pu & Zhong, 2020). The pandemic could also lead to an alteration in the cropping system of rice from "double seasons" to a "single season". This can be a threat to total production in the long term (Chen, Groenigen, Yang, Hungate, Yang, Tian, ….. Zhang, W., 2020). When the situation persists, more populace may go back into hunger and poverty, and this would have effect on the Sustainable Development Goals (SDG) goal of eradicating poverty by 2030. (Pu & Zhong, 2020). The pandemic also had an effect on the variations in prices and demand for products resulting from the number of confirmed COVID-19 cases and the total number of deaths (Kamdem, Essomba & Berinyuy, 2020).

In addition, the number of farmlands abandoned may upsurge during the period of the pandemic and this would directly have effect on production capacity (Pu & Zhong, 2020). The emergence of COVID-19 led to crashes in stock market history (Mazur, Dang & Vega, 2020). The mandatory lockdown Social distancing made some producers to miss some production windows, this led to a momentous short-term interference and harvest loss which would reduce the production investment for the next season (Pu & Zhong, 2020). The poor people would be hurt by food shortage and high prices at the recuperating period of the pandemic (Si, Zhang & Fan, 2020). This would have a severe impact on the global food system (Pu & Zhong, 2020).

On the long run, the elongated pandemic will result to low purchasing power of the populace, the farmers may respond to the situation by eating up their rice stocks and seed (Arouna *et al*., 2020). Also, income shocks would be experienced as a result of the pandemic, dietary quality and food security will get worse. Business activities will be majorly affected by

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this shock, there will be a wide interruption in the world's supply chains, and weaker demand for services and goods (Salisu *et al.*, 2020).

2.3 Empirical literature

Laguna *et al*. (2020)'s study on the impact of COVID-19 lockdown on food priorities. Results from a preliminary study using social media and an online survey with Spanish consumers, described the effect of the COVID-19's health predicament on people's behaviour, interests and opinions, towards food. Studies was carried out on the features of the utmost watched Tweeted messages and YouTube videos in relation to food and COVID-19, using online questionnaire to gather data from Spanish population (sample size was 362). Variations in food shopping habits during the lockdown, motivations behind the variations and reliability of received information from the media were viewed. The result showed that the early searches and utmost watched YouTube videos were on comprehending what COVID-19 is and the manner by which the ailment can spread and progress. In addition, when the official statement of the pandemic was released, the trending searches regarding shopping and food increased. The data collected from Twitter revealed that there was a development from concerns of shopping to a feeling of uncertainty for the looming crisis, a decrease in shopping frequency, and the products that were purchased with higher frequency were vegetables (health motivations), pasta, and other types of foods like chocolates, cheese and nuts which were purchased to improve shoppers' mood. Also, the purchase of products with short shelf-life like seafood and fish decreased. Also, the purchase of food that contribute to body weight gain and viewed as unhealthy like sugary bakery foods or mood (desserts) were reduced.

Mazur, Dang & Vega (2020)'s study on COVID-19 and the March 2020 stock market crash. Evidence from S&P1500, evaluated the United States of America's stock market performance crash in March 2020, which was prompted by COVID-19. The result revealed that healthcare, food, software stocks and natural gas gained high positive returns, while equity values in real estate, petroleum, hospitality, and entertainment sectors fell intensely. Also revealed was that firms responded to the COVID-19's revenue shock in a varied manner. Also, there were cuts in remuneration but unexpectedly there were increases in newly approved salaries and cash bonuses.

Moreover, Albulescu (2020)'s study on COVID-19 and the United States financial markets' volatility, evaluated the impact of the official announcements of COVID-19's new cases and ratio of fatality on the volatility of financial markets in the United States (US). Worldwide COVID-19 and US figures were used. The study revealed that the sanitary crisis improved the realized volatility, and recommends that the elongation of COVID-19 is an essential source of financial volatility which is contesting the risk management activity.

Also, Pu & Zhong (2020)'s study on rising concerns over agricultural production as COVID-19 spreads: Lessons from China disclosed that there are increasing apprehensions over the effect of COVID-19 on agricultural production, which may pose momentous danger to the long-term food supply and thus, food security in China. The outcomes of the study also showed that illogical restrictions would block the outflow channels of agricultural products, discourage

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crucial production inputs, destroy production cycles and destabilise the capacity of production. The study consequently recommended that other countries that are experiencing grave outbreak particularly developing countries should protect domestic agricultural production by learning from China's experience.

Furthermore, Yao *et al*. (2020)'s study on soybean potential productivity and food security assessment in China under the influence of the COVID-19 outbreak, used the Suitability Distribution Model and Soybean-Cereal Constraint Model to analyse the relationship between soybean production potential and food security. The study disclosed that the pressure from the ban and barrier on food exports due to the outbreak of COVID-19 pandemic is beginning to have effect on agricultural supply chains. It has also resulted into a swift increase in the world's food prices. Also revealed was, as a lot of grain exporting countries broadcasted a ban on grain exports, the Chinese's food security problems have attracted huge international attention because, the potential soybean planting area in China is 164.3 million ha., and if the outbreak of the pandemic stops China from importing soybeans, the planting area of soybean will required to be increased by 6.9 times to satisfy the China's demands. Thus, the cereal's self-reliance rate will reduce to 63.4%, and this would hugely affect food security. This would mean that any additional unit of soybean production, will lead to a decrease in 3.9 units of cereals, and 1% increase in the self-reliance rate of soybeans will lead to a 0.63% reduction in cereals. This implies that, it will not be sustainable to sacrifice the production of cereal to growing soybeans and to rely hugely on imports.

However, in order to ensure the security of cereal, it will be difficult to exceed 42% self-reliance rate of soybeans and China will still need to import over 68% of the original import volume of soybean. Meanwhile, in the short term, the outbreak will not affect food security in China, but as the imports of soybean reduces, inadequate soybeans supply will affect the quality of life of the people. The study therefore recommended that China fortifies its international cooperation and raise its soybean's stocks in the short term in order to cushion the effect of COVID-19 outbreak. Also, China needs to formulate a soybean cultivation strategy wisely in order to raise its self-reliance rate which is the key solution to its soybeans problem in the long term, and the key to raising its cultivation of soybean is to make soybean cultivation gainful and build a sustainable soybean planting chain.

3. METHODOLOGY

3.1 Study Area

Akure Metropolis is the study area. The Metropolis comprises Akure South and Akure North Local Government Areas of Ondo State, Nigeria. Ondo State is one of the six states in South-Western Nigeria. The State was carved out from former western state, when the Federal Republic of Nigeria expanded the number of its states from twelve (12) to nineteen (19). The coordinates of Akure city are: 7°15'0"N 5°11'42"E and its population is 484,798 (National Population Census, 2006). Ondo State is made up of humid tropics with swampy areas in the extreme south, dry savannah up lands in the northern parts of the state and tropical rainforest in far north. The State lies between latitude 5° East of Greenwich and 6° to 8° North. Ondo State

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occupies a total area of 15,500 sq. m with a population of 3,460,877 and (National Population Commission, 2006).

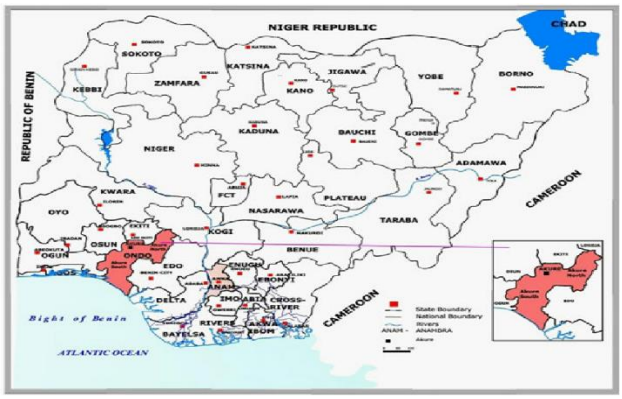

Fig: 1a. Map of Nigeria Showing Ondo State

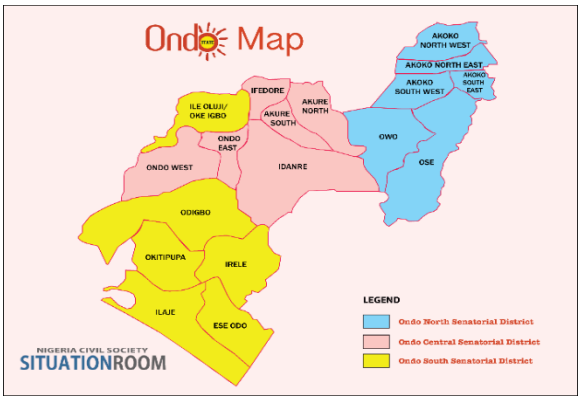

Fig: 1b. Map of Ondo State, showing Akure North and Akure South Local Government Areas which Constitute Akure Metropolis.

Sources: Wikipedia

3.2 Materials and Method

Survey design and multistage sampling (purposive, proportionate stratified and random sampling techniques) technique was used to select the respondents from four major markets (Oja Oba, Isikan, Odopetu and Osolo markets) within Akure Metropolis. Data were collected with structured copies of questionnaire and personal interview and analyzed with descriptive statistic (trend analysis and mean average). Hypothesis was tested with Analysis of Variance (ANOVA). Ondo state was purposively selected because of the proximity of the State occasioned by the restriction in mobility during the COVID-19 pandemic. The population of the study was 101 registered raw groundnut sellers in the four major markets (Oja Oba market (55), Isikan market (21), Osolo market (10) and Odopetu market (12), totally 101 groundnut sellers) in Akure north and Akure south Local Government Areas of Ondo State, Nigeria. Out of the 101 groundnut sellers, 81 were selected by using Yaro Yamane (1967)'s formula ($n = N/1+N(e^2)$. Where: n = Sample Size, N = Population of the Study, and e = error margin @ 5% (0.05). Since the raw groundnut sellers in each market were not equal, the sellers were selected from each market by using proportionate stratified sampling and simple random sampling techniques. The number of selected raw groundnut sellers that comprised the sample size are captured on table 1.

Table 1: Selected markets, number of registered groundnut sellers and number of groundnut sellers selected from each market and used as sample size.

Markets/Sample Size	NO. Groundnut Sellers	NO. Selected as sample size
1) Oja Oba Market	55	44
sikan Market	21	19
3) Osolo Market	10	8
4) Odopetu Market	12	10
Total	**101**	**81**

Source: Field Work, 2020

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Data were collected from respondents with the aid of structured copies of questionnaire and personal interview. Eighty-one (81) copies of structured questionnaire were disseminated to collect information from the selected raw groundnut sellers. Nevertheless, only 72(89.30%) copies were recovered from the sellers. The dissemination and collection of the copies of questionnaire were carried out with the aid of trained research assistants. Data were analyzed with descriptive statistic (mean average and trend analysis). Cronbach Alpha was used to test for the reliability of the research instrument while the instrument was validated by two experts in the field of the study (Agricultural Economics). The questionnaire comprised two sections, A and B. Section A was based on the socio-economic characteristics of the respondents, while section B comprised questions whose responses made information available for the assessment of the effect of COVID-19's lockdown on the price, accessibility and availability of raw groundnut in the study area. Cronbach Alpha coefficient of 0.862 which is greater than 0.7 was attained. This shows that the result is high and suitable for social science.

4. FINDINGS AND DISCUSSIONS

4.1. Socio-Demographic Characteristics of the Respondents

Table 2: Distribution of Socio-Economic Characteristics of the raw Groundnut Sellers

Personal Characteristics	Frequency	Percentage (%)
Nationality		
Nigeria	81	100
Others	-	-
Gender		
Male	78	96.30
Female	3	3.70
Age Range (Years)		
20-29	2	2.47
30-39	28	34.57
40-49	37	45.68
50-59	7	8.64
60 years and above	7	8.64
Working Experience (years)		
1-10	11	13.58
11-20	22	27.16
21-30	28	34.57
31-40	18	22.22
Above 40	2	2.47
Level of Education		
Primary School Cert	65	80.25
Secondary/O' Level	11	13.58
Vocational/Technical	3	3.70
Polytechnic/University	-	-
Not Educated	2	2.47

Source: Field Work, 2020

Table 2, reveals that, 100% of the respondents were Nigerians, majority (96.30%) of the raw groundnut sellers were men, while the remaining 3.70% were women. Moreover, 2.47% of the raw groundnut sellers were between ages 20 and 29 years, 34.57% were between ages 30 and 39 years,

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45.68% were between ages 40 and 49 years, 8.64% were between ages 50 and 59 years, while 8.64% were 60 years and above. This means that majority of the raw groundnut sellers were grown persons within productive ages of 30 to 49 years.

Furthermore, the study disclosed that 13.58% of the groundnut sellers had 1-10 years of experience, 27.16% had 11-20 years of experience, 43.93% had 21-30 years of experience, 22.22% had 31-40 years of experience, while the remaining 2.47% had 40 years above experience. This means that the groundnut sellers had enough experience to make available, valuable information on subject matter. Also, 80.25% of the beneficiaries were Primary School Certificate holders, 13.58% were Secondary/O'Level certificate holders, 3.70% had Vocational/Technical education certificate, while none of the groundnut sellers had Polytechnic/University education certificate, while the remaining 2.47% were not educated. This result revealed that, a large number of the respondents had at least primary education and this background assisted in filling of the questionnaire.

4.2 Prices (₦) Per kongo of Raw Groundnut in Selected Markets in Akure North and South Local Government Areas and Average Price Per Month Before (November 2019-March 2020) During (April 2020-August 2020) and After (September 2020-October 2020) the COVID-19's Lockdown

Table 3: Distribution of prices (₦) per kongo of raw groundnut in Selected Markets in Akure North and South Local Government Areas and Average Price Per Month Before (November 2019-March 2020) During (April 2020-August 2020) and After (September 2020-October 2020) the COVID-19's Lockdown

Months/ Selected Markets	Oja Oba Market Price of one Kongo ₦)	Isikan Market Price of one Kongo ₦)	Osolo Market Price of one Kongo ₦)	Odopetu Market Price of one Kongo (₦)	Average Price of one Kongo (₦)
Before COVID-19 Lockdown					
November	700	750	750	800	750
December	700	750	750	800	750
January	750	800	800	750	800
February	800	800	800	800	800
March	800	800	800	800	800
After COVID-19 Lockdown					
April	850	900	900	950	900
May	850	900	900	950	900
June	850	900	900	950	900
July	850	900	900	950	900
August	600	700	600	700	650
September	600	700	600	700	650
October	600	700	600	700	650

Source: Field Work, 2020

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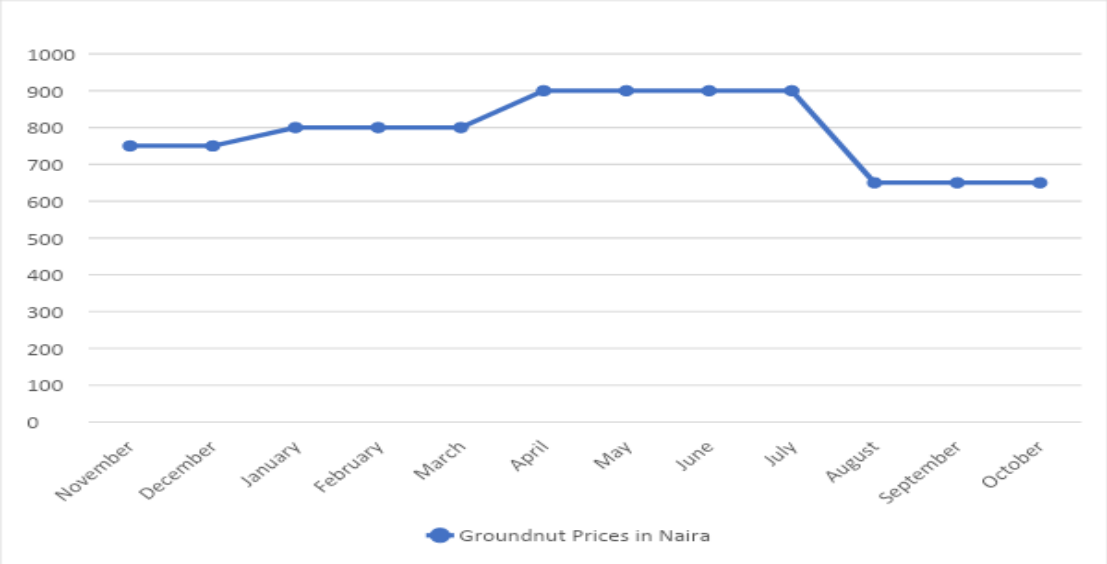

Figure 1: A chart showing the average prices of raw groundnut per kongo, per Month, in Naira, before, during and after COVID-19's Lockdown

Source: Field Work, 2020

Table 3 and figure 1, revealed that, the average price of a kongo of raw groundnut in November 2019 was ₦750, December 2019 - ₦750, January 2020 - ₦800, February 2020 - ₦800, March 2020 - ₦800, April 2020 - ₦900, May 2020 - ₦900, June 2020 - ₦900, July 2020 - ₦900, August 2020 - ₦650, September 2020 - ₦650, and October 2020 - ₦650. These figures show that the prices of a kongo of raw groundnut in the study area increased by 6.7% from December 2019 to January 2020. The price remained stable from January to March 2020, increased in April by 12.5%, when the lockdown commenced remained stable from April to July 2020, reduced by 27.78% in August 2020, and remained stable again from August to October 2020.

In an interview held with some of the respondents, they stated that,

> *although the federal government of Nigeria instructed that food and some necessities should be allowed to be transported freely within and across all State in Nigeria, even after the lockdown, this instruction was not totally adhered to. This resulted to the inability of the traders to either avoid travelling outside their local markets to purchase raw groundnut or pay extra fee to cross the barricades erected by the law enforcement officials, risk their lives, coupled with increased cost of transportation to restock.*

This situation is in agreement with that of (Cardwell & Ghazalian, 2020) who stated that, the pandemic resulted to restriction in traveling, shutting up of informal and formal markets, falling incomes, and stillness in a lot of countries' economies.

The traders also gave an example by saying:

> *the price of transportation from Akure to Mokwa in Niger State was N4,000 to and N4,000 fro, totally N8,000 per trader before the pandemic. It also cost N2,000 and*

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N1,500 to transport a bag of raw groundnut back to Akure, before the lockdown. However, during the lockdown, it cost N7,000 to and N7,000 fro, totally N14,000, to transport each trader from Akure to Mokwa in Niger State. It also cost N2,500 and N2,500 to transport a bag of raw groundnut back to Akure, during the lockdown. The traders also disclosed that the groundnut farmers also had the problem of transporting groundnut to the local markets for sale. They either had to go to and fro the farms through some unusual routes or go through the barricade. All these contributed to the cost of buying and sales of grains during the pandemic. The traders again stated that the announcement of the lockdown led to panic buying (a lot of people were buying food stuff including groundnut), there was scarcity of groundnut and the price of groundnut increased.

These findings are not far from that of (Yao *et al*., 2020) who submitted that the COVID-19 pandemic had a negative effect on supply chain, the supply chain was being affected by the stress from the lockdown, this slowed down transportation and production activities and in consequence, there was a swift rise in the world's food prices. Also, in agreement with these findings are those of (Salisu *et al.,* 2020) which anticipated that there will be a wide interruption in the world's supply chains, and weaker demand for services and goods and (Pu & Zhong, 2020) which disclosed that, the traditional offline sales channels became inefficient or censored, the channel of distribution of goods were broken, as a result of logistics restriction, the traditional urban sales channels were shut down, in consequence, there was failure of buyers to make planned purchases. Thus, the quantity of agricultural products' being marketed deeply reduced. Also, the lockdown triggered panic food purchasing and stocking of huge quantity of food by a lot of people in several countries (Pu & Zhong, 2020; Yao *et al*., 2020). Furthermore, the outcome of this study is in accord with that of (Arouna *et al*., 2020)'s projection that the prolonged lockdown would result in making the production of local rice to reduce due to shortage of inputs, labour (since the traditional mills are mainly operated by family members or individuals workers may find it difficult to travel to other regions or to and from the mill). Also, Pu and Zhong (2020) observed that the restriction could increase costs, cause high rate of death, led to labour scarcity and reduce production efficiency.

In addition, the traders disclosed that:

as the lockdown continued, people did not have enough money (purchasing power went down) to buy more food since they were not working and receiving salaries anymore - people reduced their food intake as a result of the less availability, accessibility, affordability of grains (including groundnut) as well as health reasons occasioned by sitting at home doing nothing during the lockdown. In addition, the traders stated that, it got to a time that they decided not to sell anymore, locked up their shops and kept their remaining stock to feed their families, since they could no longer restock and afford to buy other types of food like yam, garri, beans, etcetera. They were also afraid that if the pandemic and lockdown continued till the year 2021 and they finish their stuck and are unable to buy and sell more, they will run out of food to feed their families. This situation is headed towards food insecurity and sustainability. However, as the lockdown eased up, the barricade on the roads reduced, traders were able to travel to

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restock and the prices of the grains decrease to some reasonable extent and the grains became more available, accessible and affordability.

Again, this disclosure upholds that of (Laguna *et al*., 2020) which confirmed that the outbreak of COVID-19 resulted in a decrease in shopping frequency, and (Cardwell & Ghazalian, 2020; Arouna *et al*., 2020) who anticipated that there will be immense jobs loss which will decrease the consumers' purchasing power and demand, and threaten the food security of families. Also, World Food Programme (WFP) (2020)'s study which asserted that the lockdown placed the food system under risk like never before and resulted to an upsurge in the number of people under hunger, malnutrition and poverty. Moreover, it can be likened with the summation of Arouna *et al*. (2020) which concluded that, on the long run, the elongated pandemic will result to low purchasing power of the populace, the farmers may respond to the situation by eating up their rice stocks and seed. This means that, the elongation of this pandemic can cause a severe impact on the global food system (Pu & Zhong, 2020) and result in the inability to attain the second and third Sustainable Development Goals (SDGs) targeted for 2030.

Nevertheless, when the lockdown eased up in Nigeria, a lot of the barricades on the roads were removed, traders were able to travel to restock and the prices of the grains reduced to some reasonable extent and the grains became more available, accessible and affordability. This outcome is different from the study of Si, Zhang, Fan, (2020) which revealed that, the poor people would be hurt by food shortage and high prices at the recuperating period of the pandemic. The believe in Nigeria is that the country is in its recuperation period and expecting its second wave. There is anxiety that if Nigeria which according to the (UNDP, 2019) and World Bank (2018)'s Human Development Report, already has a Human Development Index of 152 out of 157 countries in the index and has continued to be weak due to under-investment, experiences a second wave of the pandemic, and the lockdown comes back, the people would go deeper into poverty, hunger and malnutrition.

4.3 ANOVA Result on the Test for Significant Difference between the Prices (₦) Per Kongo of Raw Groundnut in Selected Markets in Akure North and South Local Government Areas Before (November 2019-March 2020) and After (September 2020-October 2020) the COVID-19's Lockdown in Nigeria

Table 4: ANOVA Result on the Test for Significant difference between the Prices (₦) per kongo of Raw Groundnut in Selected Markets in Akure North and South Local Government Areas Before and After the COVID-19's Lockdown in Nigeria

ANOVA

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	8333.333	1	8333.333	.600	.004
Within Groups	41666.667	3	13888.889		
Total	50000.000	4			

Source: Field Work, 2020

Table 4 disclosed the ANOVA that was used to test if there is a significant difference in the prices (₦) per kongo of raw groundnut in selected markets in Akure North and South Local

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Government Areas before and after the COVID-19's lockdown in Nigeria. The p-value is 0.004, which is less than the table value of 0.05. Based on this result, the null hypothesis H_0, which states that there is no significant difference in the prices (₦) per kongo of raw groundnut in selected markets in Akure North and South Local Government Areas before and after the COVID-19's lockdown in Nigeria is rejected, while the alternate hypothesis which states that there is a significant difference in the Prices (₦) per kongo of raw groundnut in selected markets in Akure North and South Local Government Areas before and after the COVID-19's lockdown in Nigeria is retained.

5. CONCLUSION AND RECOMMENDATIONS

This study revealed that the price of a kongo (contains 10 cups) of raw groundnut was fairly affordable at ₦750 to ₦800 (for raw groundnut) before COVID-19 lockdown. The price of a kongo of raw groundnut increased by 6.7% from December 2019 to January 2020, remained stable from January to March 2020 and increased in April by 11.11% at the commencement of the lockdown. The price remained high from April to July 2020 during the lockdown period. The price however, reduced by 38.46% in August 2020 when the purchasing power of consumers went down and mobility started easing up and remained stable from August to October 2020. Also, the p-value of the ANOVA result was 0.004, which is less than the table value of 0.05. Thus, the paper concluded that, there is a significant difference in the prices (₦) per kongo of groundnut in selected markets in Akure North and South Local Government Areas before and after the COVID-19's lockdown in Nigeria.

The paper recommends proactive, profound and efficient changes in government's action plans, policy and strategy (particularly in food supply chain and logistics) that can ease the supply of food and reduce the negative effects of pandemic especially on staple food like raw groundnut. This action is to make this grain readily available, accessible and affordable during any pandemic in Ondo State particularly and Nigeria in general, in order to prevent food insecurity, attain food sustainability even during pandemics, and avoid pushing people deeper into poverty and hunger (SDGs one and two) by such pandemic.

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7. Declaration of competing interests

The author has declared that no competing interests exist.

References

Albulescu, C. T. (2020). COVID-19 and the United States financial markets' volatility. *Finance Research Letters*, 1-11. Available at: www.sciencedirecyt.com. doi: https://doi.org/10.1016/j.frl.2020.101699 (Awaiting publication). Accessed on 06/08/2020.

Arouna, A., Soullier, G., del Villar, P. M., & Demont, M. (2020). Policy options for mitigating impacts of COVID-19 on domestic rice value chains and food security in West Africa.

Corresponding Author: +234-806-282-4074
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Global Food Security, 1-16. Available at: www.sciencedirect.com. DOI: https://doi.org/10.1016/j.gfs.2020.100405. (Awaiting publication). Accessed on 15/07/2020.

Calderon, C., Kambou, G., Djiofack, C. Z., Kubota, M., Korman, V. & Canales, C.C. (2020). Africa's pulse. Washington, D.C.: World Bank. Available at: https://doi.org/10.1596/978-1- 4648-1568-3.

Cardwell, R. & Ghazalian, P. L. (2020). COVID-19 and international food assistance: Policy proposals to keep food flowing. *World Development, 1-16.* DOI: https://doi.org/10.1016/j.worlddev.2020.105059. (Awaiting publication). Accessed on 02/09/2020.

Chen, C., Groenigen, K. J., Yang, H., Hungate, B. A., Yang, B., Tian, Y., Chen, J., Dong, W., Huang, S., Deng, A., Jiang, Y., Zhang, W. (2020). Global warming and shifts in cropping systems together reduce China's rice production. *Global Food Security*, 24, 1-7.
Expert Panel of the American Institute of Nutrition & Life Science Research Office, 1990.

Food and Agricultural Organization (FAO), International Fund for Agricultural Development (IFAD), United Nations Children's Fund UNICEF, World Food Programme (WFP),

World Health Organisation (WHO). (2019). The State of Food Security and Nutrition in the World 2019. Safeguarding against economic slowdowns and downturns. Food and Agriculture Organization of the United Nations (FAO), Rome. http://www.fao.org/3/ca5162en/ca5162en.pdf.

Food Security Information Network ((FSIN). (2020). Global report on food crises. Available online at: https://docs.wfp.org/api/documents/WFP0000114546/download/?_ga=2.22383547.1244848274.1589504321-456469140.1587489339. Accessed on 30/07/ 2020.

Haroon, O. & Rizvi, S. A. R. (2020). COVID-19: media coverage and financial markets behavior—A sectoral inquiry. *Journal of Behavioural Experiment.* Finance27https://doi.org/10.1016/j. jbef.2020.100343. 100343.

High Level Panel of Experts (HLPE) (2014). Food losses and waste in the context of sustainable food systems. Report 8. A report by the High-Level Panel of Experts on food security and nutrition of the committee on world food security, Rome. Available at: http://www.fao.org/3/a-i3901e.pdf. Accessed on 03/06/2020.

International Food Policy Research Institute (IFPRI). (2020). COVID-19 Food Trade Policy Tracker. Available at: https://www.ifpri.org/project/covid-19-food-trade-policy-tracker. Accessed on 30/07/ 2020).

Kamdem, J. S., Essomba, R. B., & Berinyuy, J. N. (2020). Chaos, Soltons & Fractals. Available at: Sciencedirec.com. https://doi.org/10.1016/j.chaos.2020.110215 (In press). Accessed on 03/10/2020. (In press).

Kansiime, M. K., Tambo, J. A., Mugambi, I., Bundi, M. Kara, A. & Owuor, C. (2020). COVID -19 implications on household income and food security in Kenya and Uganda: Findings from a rapid assessment. World Development, *Available at* www.sciencedirect.Com. https://doi.org/10.1016/j.worlddev.2020.105199 (In press). Accessed on 02/10/2020.

Laguna, L. Fiszman, S., Puerta, P., Chaya, C. & Tárrega, A. (2020). The impact of COVID-19 lockdown on food priorities. Results from a preliminary study using social media and an online survey with Spanish consumers. *Food Quality and Preference*, 1-22. Available at:

Corresponding Author: +234-806-282-4074
E-mail: omotonia2013@gmail.com, otokhankhuele @futa.edu.ng.

www.sciencedirect.Com. DOI: https://doi.org/10.1016/j.foodqual.2020.104028 (Awaiting publication). Accessed on 02/09/2020.

Mazur, M., Dang, M. & Vega, M. (2020). COVID-19 and the March 2020 stock market crash. Evidence from S&P1500. *Finance Research Letters, 1-21*. Available at: www.sciencedirect.Com. DOI: https://doi.org/10.1016/j.frl.2020.101690. (Awaiting publication). Accessed on 03/09/2020.

National Population Census (NPC) (2006). National Bureau of Statistics Official Gazette (FGP 71/52007/2,500(OL24) Abuja. URL http://www.nigerianstat.gov.ng

National Population Commission (2006). Census of the Federal Republic of Nigeria.

National Research Council (2006). *Food insecurity and hunger in the United States: An assessment of the measure*. Washington, DC.: National Research Council.

Oyekanmi, S. (2020). Covid 19 update in Nigeria. Nigeria: Centre for Dieses Control.

Principato, L., Secondi, L., Cicatiello, C. & Mattia, G. (2020). Caring more about food: the unexpected positive effect of the Covid-19 lockdown on household food management and waste. Available at. www. Sciencedirect.com. https://doi.org/10.1016/j.seps.2020.100953. (In Press).

Pu, M.& Zhong, Y. (2020). Rising concerns over agricultural production as COVID-19 spreads: Lessons from China. *Global Food Security, 1-30. Available at: www.sciencedirect.com.* DOI: https://doi.org/10.1016/j.gfs.2020.100409 (Awaiting publication). Accessed on 03/08/2020.

Salisu, A. A., Akanni, L. & Raheem, I. (2020). The COVID-19 global fear index and the predictability of commodity price returns. *Journal of Behavioral and Experimental Finance, 1-19.* Available at: www.sciencedirect.Com. DOI: https://doi.org/10.1016/j.jbef.2020.100383. (Awaiting publication). Accessed on 05/09/2020.

Si, W., Zhang, Y., Fan, S. (2020). How to ensure food and nutrition security under the COVID -19 epidemic: A global perspective. *Issues in Agricultural Economy*, 483, 11-16.

Tan, W., Zhao, X., Ma, X., Wang, W., Niu, P., Xu, W., … Wu, G. (2020). A novel coronavirus genome identified in a cluster of pneumonia cases—Wuhan, China, China CDC Weekly, 2(4), 61–62.

Torero, M. (2020). Prepare food systems for a long-haul fight against COVID-19. 2020. Available at: https://www.ifpri.org/blog/prepare-food-systems-long-haul-fight-against-covid-19. Accessed on 03/08/2020.

Udmale, P., Pal, I., Szabo, S., Pramanik, M., Large, A. (2020). Global food security in the context of COVID-19: A scenariobased exploratory analysis. *Progress in Disaster Science*, 1-18. Available at: www.sciencedirect.Com. DOI: https://doi.org/10.1016/j.pdisas.2020.100120. (Awaiting publication). Accessed on 02/09/2020.

United Nations (UN). (2015). Transforming our world. The 2030 agenda for sustainable development: A/RES/70/1. New York: United Nations. URL: https://sustainabledevelopment.un.org/post2015/transformingourworld/publication. Accessed on 30/7/2020.

United Nations Development Programme (UNDP). (2019). Human Development Report 2019. Beyond income, beyond averages, beyond today: Inequalities in Human Development in the 21st Century

Corresponding Author: +234-806-282-4074
E-mail: omotonia2013@gmail.com, otokhankhuele @futa.edu.ng.

Wei, H. & Lu, Q. (2020). Impact of COVID-19 on Agriculture, rural areas, rural people and countermeasures. *Economic Review Journal*, 425, 36-45.

Wikipedia - Map of Nigeria Showing Ondo State and Map of Ondo State, showing Akure North and Akure South Local Government Areas

Whelan, J. & Msefer, K. (1996). Economic supply and demand. Prepared for the MIT system dynamics in Education project under the supervision of Professor Jay W. Forrester. pp. 1-34.

World Bank (2018). Human Capital Index Report

World Food Programme (WFP), (2020). World food programme to assist largest number of hungry people ever, as coronavirus devastates poor nations. Available at: https://www.wfp.org/new`s/world-food-programme-assist-largest-number-hungry-people-ever-coronavirus-devastates-poor. Accessed on 30/07/2020.

Yao, H., Zuo, X., Zuo, D., Lin, H., Huang, X. & Zang, C. (2020). Study on soybean potential productivity and food security assessment in China under the influence of the COVID-19 outbreak. *Geography and Sustainability, 1-22.* Available at DOI: https://doi.org/10.1016/j.geosus.2020.06.002. (Awaiting publication). Accessed on 01/09/2020.

Yamane, Y. (1967). *Statistics: An Introductory Analysis*. 2nd Ed. New York: Harper and Row.

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