



EFFECTS OF COVID-19 ON AGRICULTURE IN SOUTHERN KADUNA STATE OF NIGERIA

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ABSTRACT: *This paper examined the effects of Covid-19 on agriculture in Southern Kaduna, Kaduna State, Nigeria, with a view to providing information for sustainable agricultural production even in the presence of any epidemic of disease. Data for this study was obtained through questionnaire survey, in-depth interview and direct field observation. The result indicates that the negative effects of Covid-19 on agriculture are as follows: increase in the prices of seedlings, fertilizers, herbicides/insecticides, increase in the cost of farm labour, losses in farm produce, prevent buyers from buying farm produce, depreciate the cost of poultry and dairy products, and difficulties accessing veterinary services and animal feed. The result also indicates that Covid-19 has positive effects on agriculture as follows: it led to the production of more crops, led more people into agriculture, led to increase in the prices farm produce, led to the cultivation of more lands, increase in the purchase of farm tools, increase in the supply of food items into the market, forces many people in the city to involve in agriculture, increase in the purchase of farm inputs and lastly, it forced many people who are not farmers into agriculture. It is recommended that soft loan be giving to farmers so as to encourage them to boost food production in the country, distribution of good medical facilities and personnel and free treatment to the affected persons in the rural areas to improve their healthy conditions and finally, sensitization and training of farmers on modern methods of agriculture that will involve social distancing to improve the health conditions of the farmers.*

KEYWORD: Covid-19, Pandemic, Negative Effects, Positive Effects, Agriculture, Southern Kaduna

INTRODUCTION

Agriculture provides livelihoods to more than one billion people worldwide and remains the back bone of many low-income countries, accounting for 60.4 percent of employment and contributing up to two-thirds of gross domestic product in some of those countries (East African Business Council (EABC, 2020). The Nigeria agricultural sector holds the key to the country's drive for economic diversification. Agricultural sector remains the largest employer of labour in the country, providing jobs for more than one third (36.4%) of the Nigerian labour force (Princewaterhouse Coopers {PWC}, 2020). However, agriculture in Nigeria still faces many challenges such as adverse weather conditions associated with climate change,



herder-farmer clashes, terrorism in the northeast, cattle rustling, low level of mechanization and poor research and development activities (PWC, 2020).

Disease outbreak and global pandemics have been the greatest threat for the sustainability of human existence on earth. Mankind has witnessed many pandemics over the course of human history that killed millions of people and ravaged the global economy (Poudel, *et al*, 2020). Covid-19 has impacted global food security and agriculture due to the lockdown and movement restriction across many countries of the world (Poudel, *et al*, 2020; PWC, 2020). Lockdown was imposed to control the spread of the Covid-19 by various governments in the world (Khan, *et al*, 2020; United Nation Educational, Scientific and Cultural Organization {UNESCO}, 2020). Both lives and livelihoods were at risk from the Covid-19 pandemic (FAO, 2020a). These measures have had huge immediate effects on the economies of countries in the African continent, the worst since the 2008 global financial crisis (UNESCO, 2020). The spread of the Covid-19 affects significant elements of food supply due to the disease's impact on people's lives and well-being (Food and Agricultural Organization {FAO}, 2020a; 2020b) also posing serious challenges for the sustainable functioning of agri-food markets (Jambor, *et al*, 2020).

The lockdown included the restriction of non-essential movement of people, goods and services. As a result, agribusinesses were unable to travel between rural and urban areas and therefore unable to participate in the market; receive veterinary products and services for their animals. This led to a loss in income, a reduction in livestock herds and delays to the harvest (Mercy Corps, 2020). A recession caused by COVID-19 has resulted in additional adjustments to a functional food supply system. Changes in consumer incomes impacted food demand across all product lines. Global changes in demand and exchange rates altered agricultural trade flows (Anderson, *et al*, 2020). Disruptions caused by COVID-19 led to financial stress, supply disruptions, closed and/or restricted markets and altered marketing strategies for crop producers. School and restaurant closures have eliminated many existing direct markets for farmers and ranchers (Anderson, *et al*, 2020). In many countries, farmers are not in the condition of transporting products to market because of the lockdown and they have suddenly found themselves in desperate conditions World Farmers Organization {WFO}, 2020). Because of all the challenges they are facing, like other economic actors, farmers are bearing the society costs of this pandemic on their own shoulders. This is not sustainable in many cases, so farmers are having big losses in their income, which also affects the economic conditions of their families and communities (World Farmers Organization {WFO}, 2020).

Over 75% of the Southern Kaduna people involved in agriculture and considered farming as their main occupation (Shamah, 2009). They engage in farming to provide food and cash for their family. The southern is a region that produces variety of food and cash crops and also domestic animals but face with many challenges including the outbreak of epidemic of diseases to crops and animals. Many studies have been conducted in study area on agriculture. These include impact of socio-economic factors on the adoption of ginger production technologies (Husman *et al*, 2015), impact of commercial agricultural development project on farmers empowerment (Ibrahim *et al*, 2017). Unfortunately, none of the studies conducted was done on the effects of Covid-19 pandemic on agriculture in the study area, as such; this study examines the positive and negative effects of Covid-19 on agriculture in southern Kaduna, Kaduna State, Nigeria, with a view to providing information for sustainable agricultural production even in the presence of any epidemic of disease



MATERIALS AND METHODS

Study Area

Southern Kaduna is located between latitudes 10° 0' 00" to 10° 39' 00"N and longitudes 6° 40' 00" to 8° 27' 00" east of the Greenwich Meridian (figure 1). It has AW type of climate, as classified by Koppen which is characterized by two distinct seasons: wet and dry. The wet season begins in April and end in October with a peak of rainfall in August, while, the dry season begins from November to March. These seasons are influenced by the tropical maritime and tropical continental air masses. The mean annual rainfall decreases from about 1659.44mm in Kafanchan to about 1245.97mm in Kaduna, and the average minimum and maximum temperature are 15.1⁰C and 35.18⁰C, while relative humidity is about 62% (Ishaya and Abaje, 2008; Abaje, *et al.*, 2018). The vegetation of the study area is a Guinea savanna type (Udo, 1970; Buba, 2015). It is savanna woodland characterized by tall trees of about 20-40m high. Shrubs and tall grasses up to 3m tall also found. The natural plant covers of the study area have been greatly modified by human activities such as bush burning, woodfuel harvesting, farming, timber extraction and overgrazing (Abdul, 2010; Isma'il *et al.*, 2015; Dabo, 2016; Zankan, 2019). Some of the tree species found in the area includes: *Ceiba petandra*, *Parkia biglobosa*, *Khaya senegalensis*, *Mangifera indica*, *Vitex doniana*, *Anogeissus leiocarpus*, *Borrassus aethiopum*, *Piliostigma thonningii*, and *Prosopis africana* and grasses like *Pennisetum purpureum*, *Andropogon gayanus* and *Tridax procubens* are common. The relief influences the drainage pattern. Most of the study area lies within the Mada, Okawa and Gurara River basin (Udo, 1970). The Okawa and Mada systems flow into the River Benue, while the Gurara flows into the River Niger. There are several streams and rivers, among them are rivers Kogum, Matsirga and Kaduna

Type and Sources of Data

The primary data for this study was collected through the questionnaire survey, in-depth interview and direct field observation. The targeted population for the study includes farmers, herders, and traders who were 18 years and above in the study area. The questionnaire consisted of close and open-ended questions. The information obtained from the questionnaire includes demographic characteristics of the respondents, negative effects of Covid-19 on agriculture, positive effects of Covid-19 on agriculture and ways that may improve agricultural production even in the presence of Covid-19 in the study area. The documentary source was obtained from journals, newspapers, unpublished dissertations and theses.

Sampling Technique

A field survey was carried out in the study area to obtain the primary data for the study. The study area has eleven local governments that include Sanga, Jema'a, Jaba, Zangon-Kataf, Kaura, Kauru, Kachia, Lere, Kajuru, Kagarko and Chikun. To collect the data for the study, 60% (seven {7}) local government areas were selected at random. They include Jema'a, Zangon-Kataf, Sanga, Lere, Kachia, Jaba, and Chikun. Self-administered questionnaire to 384 respondents (Krejcie and Morgan, 1970) was done across the study area using systematic sampling procedure for the farmers and availability sampling procedure for the herders and traders. The respondents for the questionnaire administration were people that were 18 years and above in the study area. In-depth interview was done with some stakeholders that were

not included in the questionnaire survey. Direct field observation was also carried out to have a direct contact with the resident of the study area and also obtain first hand information in the affected communities. The in-depth interview and direct field observation were conducted in order to complement the result obtained from the questionnaire survey.

Data Analysis

The data obtained from the field survey were in two categories: qualitative and quantitative data. The quantitative data through questionnaire was analyzed using descriptive statistics such as, tables and percentage, while the qualitative data obtained through in-depth interview was subjected into transcription and represented in narrative format to further strengthen the quantitative data.

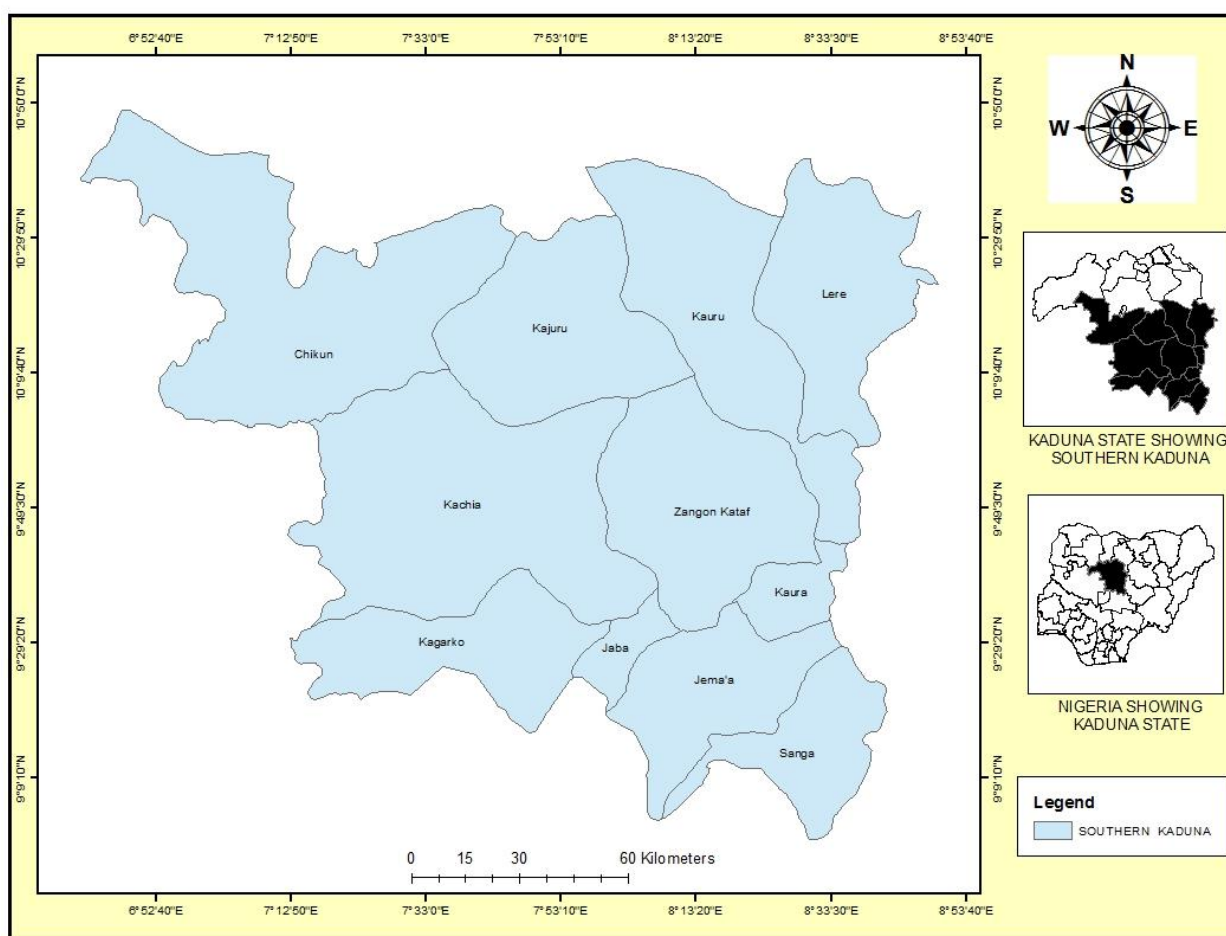


Figure 1: The study area

Source: *Gis Lab Buk*



RESULTS AND DISCUSSION

Demographic Characteristics of the Respondents

In this study, about 24.7% of the study population was people who combine farming and civil service work as their occupation, 38.3% farmers, 2.1% artisan, 6.8% traders, and 28.1% civil servants. Most of those who claimed not to be farmers also engaged in little agricultural activities such as keeping of livestock and cultivation of crops around their homes to provide food for the family. About 74.2% was males while, 25.8% females. 77.6% married, 14.6% single, 7.8% widows, and 3.1% fall below 20 years, 68.2% fall between 30 to 39 years, 24.0% fall between the age of 40 to 59 years, while 4.7% falls between the age of 50 years and above. In terms of education, 23.2% have had primary education, 50.3% secondary education and 23.5% tertiary education while 3.0% have had different kind of education and knowledge such as Qur'anic education and blacksmithing.

Table 1: Negative Effects of Covid-19 in Southern Kaduna

Variable	Category				
	SA	A	SD	D	Total
Increase in the prices of seedlings	238(62%)	128(33.3%)	18(4.7%)	0(0%)	384 (100%)
Increase in the prices of fertilizer	219(57%)	165(43%)	0(0%)	0(0%)	384 (100%)
Increase in the prices of herbicides/insecticides	256(66.7%)	111(28.9%)	0(0%)	17(4.4%)	384 (100%)
Causes conflict among farmers due to shortage of farmland	71(18.5%)	165(43%)	18(4.7%)	130(33.8%)	384 (100%)
Increase in the cost of farm labour	130(33.8%)	220(57.3%)	18(4.7%)	16(4.2%)	384 (100%)
Losses in irrigation farm produce	147(38.3%)	128(33.3%)	58(15.1%)	51(13.3%)	384 (100%)
Prevents buyers from buying farm produce	73(19%)	220(57.3%)	55(14.3%)	36(9.4%)	384 (100%)
Depreciates the cost of poultry products	92(23.9%)	183(47.7%)	36(9.4%)	73(19%)	384 (100%)
Depreciates the cost of dairy products	112(29.2%)	167(43.5%)	17(4.4%)	88(22.9%)	384 (100%)
Difficulties accessing veterinary service for sick animals	138(36%)	168(44%)	42(11%)	36(9%)	384 (100%)
Difficulties accessing animal feeds	161(42%)	173(45%)	31(8%)	19(5%)	384 (100%)

Concerning the negative effects of Covid-19 on agriculture in southern Kaduna, majority of the respondents (62% and 33.3%) strongly agreed and agreed that Covid-19 led to increase in the prices of seedlings in the market (table 1). Most of the cultivars such as rice, maize, groundnut and soya beans which people intended to plant had increase their prices in the



market due to the lockdown and restriction on movement caused by Covid-19 (PWC, 2020). The restriction on movement increased the cost of transportation and also prevented people from supplying goods including seedlings into the market and this has led to increase in the prices of goods. For example, a Mudu of cowpea which was sold at the rate of #150 between January and February was sold at the rate of #300 during the planting season. This increase in the prices of the seedlings was as a result of the Covid-19 pandemic which forced the federal government of Nigeria to increase the cost of some commodities such as petroleum price, Value Added Tax (VAT), electricity in the country that also affected agriculture. This affected many farmers who wanted to open more fields for agriculture due to inadequate fund to buy more seedlings.

Most of them (57% and 43%) strongly agreed and agreed that Covid-19 has led to increase in the prices of fertilizer (table 1). Covid-19 also affected the prices of fertilizers in the market. For example, fertilizers such as NPK and Indorama (Urea) which were sold at the rate of #8800 and #7500 respectively, during the planting season of 2019 was sold at the rate of #14500 and #10500 in the year 2020 due to Covid-19. The increase in the prices of these items was as a result of the lockdown which increase the cost of transportation and the ability of the government to generate more income (increase in prices of PMS, VAT and electricity) due to the effects of the Covid-19 pandemic on the economy. This increase in the prices of the fertilizers also caused serious effects on agriculture where many farmers did not apply required fertilizers for their farms to improve crop yield.

Most of them (66.7% and 28.9%) strongly agreed and agreed that Covid-19 has led to increase in the prices of herbicides and insecticides (table 1). Farmers use herbicides and insecticides to control weeds and pests in their farms. But during the lockdown caused by the Covid-19 pandemic, most of these items had increase in their prices. The increase in the prices of the items is also associated to the hardship in the country caused by Covid-19 which forced the federal government of Nigeria to increase the prices of some commodities such as electricity, PMS and Value Added Tax (VAT), this also forced many people in the urban areas to go back to their villages and as a result, engaging in farming just for survival. This led them to rush for these chemicals in order to apply in their farms to eliminate grasses and pests. Because of the over demand for these chemicals, their prices continued to increase in the market as such affecting farmers who had little money for farming.

High number of them (18.5% and 43%) strongly agreed and agreed that Covid-19 led to conflict among farmers (table 1). There were a number of people who abandon their farmlands for white-cola jobs in the city many years ago. The hardship caused by Covid-19 forced many of them to resume their former occupation (farming) in their villages in order to provide food for their families. But most of their farmlands were occupied by other people which led to misunderstanding among them over claiming the ownership of land. Most of these cases were settled in the police custody or court. As quoted from a farmer at Jagindi Tasha:

The corona virus caused serious conflict among people in the study area. This is because those who abandon their farmlands and move into the city for government job returned home due to the hardship caused by the corona virus. Many of them tried to go back to farming to provide food for their families but relatives or other people have occupied those farms leading to conflict among them (Bagel, Per. Com. August, 2020).



But 4.7% and 33.8% strongly disagreed and disagreed that Covid-19 has led to conflict among farmers. Most of those who had this view were people who cultivated their farmland without any interruption.

Most of them (33.8% and 57.3%) strongly agreed and agreed that Covid-19 led to increase in the cost of farm labour (table 1). The increased in the number of people into agriculture as a result of the hardship caused by Covid-19 pandemic also increased the cost of farm labour in the study area. This occurred as a result of the limited number of labourers/tractors within the localities to meet the demand for farmers which increased the cost of labour. The restriction of movement prevented labourers who used to come from Plateau State during the rainy season to work from coming to the study area. In some communities that had access to tractors (machines), hiring was on first come first serve bases which affected many farmers who wanted to open large areas for agriculture, secondly, the cost fueling the tractors was very high affecting both the tractors owners and the farmers. This forced many of them to rely on human labour for farming. This work is in line with EABC (2020) which noted that the restriction on travel and movement, as well as the health impacts of the Covid-19, would likely lead to a shortage of labour, raw materials and infrastructure which may significantly disrupt the harvesting and processing of raw food, impacting the supply chain across Africa.

Most of them (38.3% and 33.3%) strongly agreed and agreed that Covid-19 led to losses in farm produce (irrigation farm produce) (table 1). The restriction of movement during the Covid-19 pandemic in Nigeria prevented many people in the city who buy the irrigation farm produce from travelling to the rural areas for the products. Most of the farm produce are perishable goods like tomatoes, pepper and spinach, poultry and dairy products got spoilt due to the absence of the buyers. As quoted from a farmer at Nindem-Kogo:

We lost a lot of our farm produce in due to Covid-19. Most of the crops we produce are perishable goods such as spinach, tomatoes, okra and pepper. Those who used to come from the city like Abuja were prevented from coming which caused our farm produce to spoil. In fact, we run our business at lost (Manga, Per. Com. July, 2020).

Those who did their irrigation farming in the urban centres like Kafanchan and Kagoro were not allowed to weed and watered their farms or harvest their crops. This also led to losses in farm produce in the study area. The result is in line with EABC (2020); Jambor *et al*, (2020) and (PWC, 2020) which noted that high value, and especially perishable commodities, such as fresh fruit and vegetables, meat, fish, milk and flowers, were particularly affected through wastage.

Most of them (19% and 57.3%) strongly agreed and agreed that Covid-19 prevented buyers from buying farm produce (table 1). The restriction of movement prevented farmers, retailers and wholesalers to sale their products. This affected many farmers who wanted to sale their farm produce during that period in preparation for farming season or solving their problems. The rural areas where crops are producing recorded low prices of food items due to the absence of buyers, but the prices almost double in the urban centres that have no direct access to the farm produce due to short supply. As quoted from a trader at Zankan-Nindem:



Most of those who used to come from the city for the farm produce were restricted from movement due to the spread of the Covid-19. This led to the fall in prices of agricultural produce in the rural areas, but a rise in the urban centres due to short supply (Abdulhamid, Per. Com. August, 2020).

This work is in line with (FAO, 2020a, PWC, 2020) which noted the spread of the Covid-19 had effect on the vulnerable groups such small-scale farmers and women by preventing them from accessing markets to sale their products or buy seedlings and other essential inputs, or struggle due to higher food prices/limited purchasing power.

Majority of them (23.9% and 47.7%) strongly agreed and agreed that Covid-19 depreciates the cost of poultry products (table 1). The lockdown and the decline in the purchasing power of most of the citizens affected the sale of poultry products such as eggs and broilers in Southern Kaduna. Restriction of movement and closure of schools, hotels and restaurants and other places that needed poultry products drastically affected most of the farms and their owners in Nigeria (Anderson, *et al*, 2020; Poudel, *et al*, 2020). This is because people were not allowed to buy those products from the hands of the farmers which led to losses. Apart from that, those who sold their own did it at cheaper rate to avoid spoilage. As quoted from a farmer in Kaduna:

We are stuck with so many products in the farm. This has forced us to bring down prices to ridiculous levels. Eggs are perishable, so you can't hold on to them for long (Okunade, Premium Times, 7, May, 2020).

Closure of shops, restaurants, and schools has notably reduced the market space for agricultural products with great impact on the sector (World Farmers Organization {WFO}, 2020). This has led farmers to struggle with less demand for their produce.

Most of them (29.2% and 43.5%) strongly agreed and agreed that Covid-19 depreciates the cost of dairy products (table 1). The lockdown caused restriction of movement of people from one place to another. This caused serious effects on dairy products such as milk, oil and meat. The lockdown prevented people/industries that needed the dairy products from having access to the products. This did not affect the producers alone, but also the consumers and industries that needed them for consumption and as raw material for their industries. This work is in line with Khan *et al*, (2020), Mercy Corps (2020) which associated the effects of the locked down to decrease in the demand for the dairy products and damage to the dairy industries in the world which have disturbed the socioeconomic condition of the dairy owner and weakened their economy. Apart from this, the demand for cattle became very low due to the lockdown. Buyers were no longer available to buy the little cattle brought to the market for sale, restaurant, hotels and schools that needed meat were short down which forced the suppliers sometimes to return their cattle home. This made many of them to lose a lot of money paid for transportation of the cattle to the market. But 4.4% and 22.9% strongly disagreed and disagreed that Covid-19 depreciates the cost of dairy and dairy product. Most of those who had this view were people who produce the products at low quantity which were sold to people within their locality.

Concerning the effects of the Covid-19 pandemic on veterinary service, (36% and 44%) strongly agreed and agreed that Covid-19 caused difficulties accessing veterinary service for sick animals. Most of the veterinary service and products are found in the urban centres.



Those who needed the products and services in the rural areas faced difficulties accessing them due to the lockdown caused by the Covid-19. Those that had access to the services, face increase in the prices of the products due to the restriction of movement. As a result, many farmers lost their livestock such as pigs, goats, sheep and cattle. As quoted from two respondents at Kafari and Janda:

Lockdown caused by the corona virus did not allow us to have access to veterinary services to treat our sick animals or buy feed (Dusa) for our livestock, as a result, we lost a lot of our animals (pigs and goats) in our localities (Bature, Per. Com. August, 2020).

We lost a lot our livestock because we live our life in the bush and get those who treat our animals in the urban areas. Security men did not allow us to visit the urban centres for the medical attention of our sick animals. It affected us a lot because our livelihood depends on these animals (Abdullahi, Per. Com. August, 2020).

This work is in line with Mercy Corps (2020) which attributed the cause of death to livestock (sheep and cattle) to the inability to reach veterinary services or access critical treatment and vaccines.

Most of them (42% and 45%) strongly agreed and agreed that Covid-19 caused difficulties accessing animal feed (table 1). Livestock owners experienced difficulties accessing animal feed during the lockdown because the suppliers are found in the urban centres. The lockdown restricted them from movement which forced them to source the feed within their localities. This affected their livestock because there was no feed enough to satisfy the animals. Most of the life's owners decided to sale their own especially those who had pigs but market was not available to sale the animals. This is because those who buy pigs in Kafanchan pig market are from south east and south-south regions of Nigeria. With the lockdown they were not having access to the market, making owners to lose their pigs to death. The cattle breeders did not have access to buy sulfur for their livestock but engaged them in free grazing in the bush. This also affected the animal health because the potash helps in digesting grasses and leaves the feed on. Places where animal feed were available had high prices. This study corroborates Mercy Corps (2020) which noted that since most animal feed suppliers are located in urban areas, breeders faced difficulties finding them. Where animal feed was accessible, most breeders said the prices were too high causing them to rely on grazing instead, yielding lower quality meat.

Table 2: Positive Effects of Covid-19 on Agriculture in Southern Kaduna

Variable	Category				
	SA	A	SD	D	Total
It led to the production of more crops	184(47.9%)	74(19.3%)	35(9.1%)	91(23.7%)	384 (100%)
It led more people into agriculture	152(39.6%)	166(43.2%)	36(9.4%)	30(7.8%)	384 (100%)
It led to increase in the prices farm produce	256(66.7%)	128(33.3%)	0(0%)	0(0%)	384 (100%)



It led to the cultivation of more farmlands	201 (52.3%)	131(34.1%)	34(8.9%)	18(4.7%)	348 (100%)
It led to increase in the purchase of farm tools	97(25.3%)	238(62%)	16(4.2%)	33(8.5%)	348 (100%)
Increase in the supply of food items into the market	146(38%)	111(28.9%)	54(14.1%)	73(19%)	348 (100%)
It forced many people in the city into farming	184(47.9%)	91(23.7%)	38(9.9%)	71(18.5%)	348 (100%)
It led to increase in the purchase of farm inputs	93(24.2%)	204(53.1%)	53(13.8%)	34(8.9%)	348 (100%)
It forced people who are not farmers into agriculture	203(52.6%)	128(33.3%)	19(4.9%)	34(8.9%)	348 (100%)

Concerning the positive effects of Covid-19 on agriculture, 47.9% and 19.3% strongly agreed and agreed that Covid-19 has led to the cultivation of more crops (table 2). The restriction of movement during the lockdown led farmers to cultivate more piece of land which increases crop production in Nigeria. It was observed that even with the rise in the prices of farm inputs such as fertilizer and herbicides, farmers still took advantage of the lockdown in the rural areas to cultivate more land for agricultural production. The production of more crops may reduce hardship in the country if food is available for people especially the urban centres who have less access to the food items unless they buy. Increase in crop production may give farmers the opportunity to earn more income for the family. As quoted from a farmer at Zonkwa:

More crops were producing due to the Covid-19 pandemic. This would reduce the hardship face by people in the country as a result of the Covid-19 pandemic. This also gave an opportunity for the farmers to earn more money for their families (Kabuk, Per. Com. August, 2020).

But some of them (9.1% and 23.7%) strongly disagreed and disagreed that Covid-19 led to the production of more crops. Most of those who had this assertion were people who did not used the advantage of the lockdown to do their agricultural activities since the rural dwellers were a bit free to move around.

Majority of them (39.6% and 43.2%) strongly agreed and agreed that Covid-19 has led more people into agriculture. The hardship caused by the Covid-19 forced people such as workers and business men who never want to combine their occupation with farming to produce food for their families. Most of the workers and business men were at home during the lockdown with no option than involving in agriculture. This gives them the opportunity to boost food production in the country. However, workers who lost their jobs in other sectors due to the Covid-19 might end up working for agriculture as another alternative for a living which is an added advantage to agricultural sector.

Most of them (66.7% and 33.3%) strongly agreed and agreed that Covid-19 led to increase in the prices of farm produce (table 2). Covid-19 led to increase in the prices of farm produce more especially after the lockdown in the rural areas (Jambor, *et al*, 2020). Farmers who stored their farm produce smiled immediately after the lockdown where prices of different food items began to rise in the market. Though prices of food items were higher in the urban



centres during the lockdown but the reverse was the case in the rural areas where buyers were not available to buy. As quoted from a farmer at Gbakun:

Farm produce had increase in their prices especially after the lockdown in the rural areas which gave those who stored their farm produce the advantage to earn a lot of money (Dauda, Per. Com. August, 2020).

High number of them (52.3% and 34.1%) strongly agreed and agreed that Covid-19 has led to the cultivation of more land (table 2). The restriction of movement during the lockdown gave an opportunity for many people including farmers to invest in agriculture which led to the cultivation of more pieces of land to boost crop production in Nigeria. It was observed that even with the rise in prices of farm inputs such as fertilizer and herbicides, farmers still took advantage of the lockdown to cultivate more land for agricultural production. Some people returned home from the urban centres and engaged in farming using the little resources they had at that time which also increased the sizes of farms and food production in those areas. Increase in sizes of farms may give people the opportunity to produce more food and earn more income for the family. As quoted from a farmer at Doka Lere:

Corona virus has led many people to cultivate more piece of land for crop production. This would increase food production in Nigeria and makes farmers to earn more income for their families (Usman, Per. Com. July, 2020).

Majority of them (25.3% and 62%) strongly agreed and agreed that Covid-19 has led to increase in the purchase of farm tools (table 2). The increase in the number of people (workers, business men and those who lost their jobs) who were into agriculture has also led to the production and purchasing of farm tools such as hoe and cutlasses in the study area. This gave an opportunity to the blacksmithing to produce more implements for farmers and earn more money from them. As quoted from a blacksmithing at Zankan-Nindem:

I really gain a lot this time because many people patronize my work by buying the farm implements, I produced. I produce a lot because they bought them from me for their farm work (Saidu, Per. Com. August, 2020).

Most of them (38% and 28.9%) strongly agreed and agreed that Covid-19 has led to increase in the supply of food items into the market (table 2). The general increased in the prices of goods in Nigeria due to the Covid-19 pandemic have motivated farmers to supply more goods into the market. The outbreak of the Covid-19 pandemic affected the sources of income for the government of Nigeria which led to increase in the prices of some commodities in the country such as electricity, PMS and Value Added Tax (VAT). This also led to increase in the prices of farm produce, and as a result, encouraged farmers to supply more and more of their farm produce into the market for sale. Most of those who stored their farm produce had the opportunity to sale them at higher prices. As quoted from a farmer at Chori:

The increase in the prices of goods in the country as a result of the Covid-19 has encourage farmers to supply more of their farm produce into the market for sale, (Yakubu, Per. Com. July, 2020).

Most of them (47.9% and 23.7%) strongly agreed and agreed that Covid-19 has forced many people in the city to involve in agriculture (table 2). Most people in the city prefer to go for white-collar job and other form of businesses than agriculture. But with the increase in



hardship caused by Covid-19, many of them have decided to take agriculture as the next occupation in order to reduce their over reliance on their income for the family needs. The restriction of movement during the lockdown hit those who were in the city very hard. This made many of them to combine their occupation with agriculture for a living.

High number of them (24.2% and 53.1%) strongly agreed and agreed that Covid-19 has led to increase in the purchase of farm inputs (table 2). Farm inputs such as fertilizers are applied in the farm to improve crop yield. The prices of farm inputs such as fertilizers, herbicides and insecticides increased rapidly in Nigeria due to the Covid-19 pandemic. Yet, farmers still bought them in large quantity for their crop production due to increase in sizes of farmlands. Those who used to produce just for consumption decided to cultivate more piece of land in order to produce more crops for commercial means. This is because they were motivated by the rise in the prices of the goods in the market. This makes them to demand for more fertilizers and other farm inputs to facilitate growth and improve their crop yield.

Most of them (52.6% and 33.3%) strongly agreed and agreed that Covid-19 has led many people who were not to farmers to be involved in agriculture. A lot of people don't want to involve in agriculture especially when they are opportune to attain certain level of education, wealth or job. This makes them to rely solely on their source of income for their family needs. But with the outbreak of the Covid-19 pandemic, many of them were forced to get involved in agriculture in order to provide food for the family. The restriction of movement did not allow most of them to buy what they wanted at the moment they needed them. This makes some of them to go into agriculture in order to solve some of these problems. This is because when food is at home, it reduces the suffering of the family.

CONCLUSION

Disease outbreak and global pandemics have been the greatest threat for the sustainability of human existence on earth. Human being has witnessed many pandemics over the course of his life on earth. Agriculture which is the backbone of many economies has suffered due to these pandemics as they affect the healthy conditions of the farmers and their livelihood. Nigeria is a country where high number of its citizens is employed in the agricultural sector has been affected with the Covid-19 pandemic positively such as increase in the prices of agricultural produce, increase in the number of people into agriculture and food production and, negative effects such as the increase in the prices of farm inputs, losses in agricultural produce due to lockdown and depreciation in the cost of poultry and dairy products. It is recommended that soft loan be giving to farmers so as to encourage them to boost food production in the country, distribution of good medical facilities and personnel and free treatment to the affected persons in the rural areas to improve their healthy conditions and finally, sensitization and training of farmers on modern methods of agriculture that will involve social distancing to improve the health conditions of the farmers.



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APPENDIX

QUESTIONNAIRE ON THE STUDY OF THE EFFECTS OF COVID-19 ON AGRICULTURE IN SOUTHERN KADUNA STATE OF NIGERIA

Kindly respond to the questions below as that will help us to generate data for the research. All responses shall be treated confidentially and information obtained shall be use for the purpose of this work only.

Thanks

INTRODUCTION: Please fill in or tick the right option in the space provided below.

Section A: Personal information

1. Sex (a) Male () (b) Female ()
2. Age (a) Less than 20 years () (b) 20-39 years () (c) 40 -59years () (d) 60 years above ()
3. Marital status (a) Married () (b) Single () (c) Widow () (d) Divorce ()
4. Level of education (a) Primary () (b) Secondary education () (c) Higher education () (d) Others specify.....
5. Occupation (a) Farmer () (b) Artisan () (c) Trader () (d) Civil servant () (e) Others specify.....

Note: AS-Strongly Agreed, A-Agreed, A-Strongly disagreed, D-Disagreed

Section (B): Negative Effects of Covid-19 on Agriculture

S/N	Questions	SA	A	SD	D
6	Covid-19 has led to increase in the prices of seedlings				
7	Covid-19 causes increase in the prices of fertilizer				
8	Covid-19 causes increase in the prices of herbicides/insecticides				
9	Covid-19 has led to conflict among farmers due to shortage of farmlands				
10	Covid-19 has led to increase in the cost of farm labour				
11	Lock down during Covid-19 led to losses in irrigation farm produce				
12	Lock down during Covid-19 prevents buyers to buy farm produce				
13	Lock down during Covid-19 depreciates the cost of poultry products				
14	Lock down during Covid-19 depreciates the cost of dairy products				
15	Difficulties accessing veterinary service for sick animals				
16	Difficulties accessing animal feeds				



	Section (C): Positive Effects of Covid-19 on Agriculture				
17	Covid-19 has led farmers to produce more goods				
18	More people are in to agriculture due to Covid-19				
19	Farm produce are sold at higher prices due to Covid-19				
20	More farmlands are cultivated due Covid-19				
21	Covid-19 has led to increase in the purchase of farm tools				
22	More food items are supply to the market due to Covid-19				
23	Many people in the cities are into farming due to Covid-19				
24	Covid-19 has forced many people to buy more farm inputs				
25	People who are not farmers are into agriculture due to Covid-19				

26. Write other effects of Covid-19 on agriculture to the society

27. Suggest ways that may improve agricultural production even in the presence of Covid-19

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