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EFFECT OF CORONA-VIRUS PANDEMIC ON FOOD SECURITY AND AGRICULTURAL PRODUCTION IN IKA NORTH EAST LOCAL GOVERNMENT AREA OF DELTA STATE, NIGERIA

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Abstract
The study examined the effect of the corona-virus pandemic on food security and agricultural production in Ika North East Local Government Area, Delta State. Farmers in Ika North East Local Government Area formed the population for the study. Data were collected using a structured questionnaire from 150 respondents. The result showed that 56% of the respondents were males, and 38% of the agriculturalists fell within the age bracket of 50-59. The marital status of the respondents shows that 68% were married and the farmers that acquired secondary education constitute 46%. The majority of the respondents had a household size of 4-6 persons. The result on the level of education of the farmers showed that 58.0% of the respondents had formal education. The result also shows that 60% of the correspondents had farming experience within the range of 1-19 years. The results proved that the respondents were majorly affected by constraints such as restriction/lockdown, lack of funds/credit, inadequate transport facilities, and high prices of inputs. It is therefore recommended that the availability of agricultural incentives such as improved seedlings, agrochemicals, loans, etc, to motivate the increase in agricultural production and extension agents should be employed and sent to rural areas to provide new and practical agricultural information to farmers.

Introduction
Food insecurity has been established to be one of the major challenges facing developing countries. This is because the ratio of the human population to food has constantly been on the decline. This is as evidenced by a Food and Agriculture Organization (FAO) report (FAO et al., 2020) which showed that some two billion people faced food insecurity at the moderate or severe level. So much is being done to address these challenges. However, the effects of the extensive efforts on food insecure persons in the world are almost useless in

recent times owing to the emergence of the Corona virus outbreak. The COVID-19 pandemic which has spread rapidly and extensively around the world since late 2019 is a novel and global health event caused by the Severe Acute Respiratory Syndrome Coronavirus-2 (SARS-CoV-2) that has had profound implications for food security and nutrition (Ilesanmi and Afolabi, 2020; CFS, 2020).

Food security is a complex, multifaceted concept usually influenced by culture, environment, and geographical location (Economic Intelligence Unit, 2018). The Food and Agriculture Organization of the United Nations (FAO) defines food security as "when all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life" at five distinct levels (individual, home, national, region, and global)" (Perez-Escamilla, Gubert, Rogers and HromiFieldler, 2017). Nigeria, according to World Data Lab (6 May, 2020) has an estimated population of 205,323,520 persons and has 102,407,327 people having a very low income (50% of the total population) (World Data Lab, 2020). Nigeria is unarguably the most populous nation in Africa and ranked number 7 globally with an estimated growth rate of 2.43 percent per annum and a high dependency ratio of 88 percent. Nigeria's population is approximately 2.64% of the worlds' total population and it is projected to reach 401million by 2050 (National Population Commision/National Bureau of Statistics, 2018; Otekunrin, and Otekunrin, 2020).

Nigeria recorded the first confirmed case of Coronavirus in February 2020 while on Friday 28th of February 2020, the World Health Organization (WHO) declared the COVID-19 outbreak a global pandemic leading governments all over the world to take precautionary measures to contain it's spread. The onset of the epidemic sparked a series of governmental initiatives, including as public health and education campaigns, financial and monetary measures in the form of social protection for the disadvantaged. (Onyekwena, Amara Mma, 2020). The COVID-19 pandemic affected a large proportion of agriculturalist around the world. Minimal stock of production inputs (seeds, pesticides, fertilizers, machinery) and shortage of labor forces complicated crop production activities (FAO 2020). The epidemic devastated social and economic systems and spread dread around the world. The farming industry was greatly affected; the crop farmers and farmers in general were restricted from going to their farms; consequence of the lockdown. Farm production and, indeed food in general, was affected; thus food security was

compromised.

Farming systems in Nigeria were threatened with series of challenges such as economic and environmental challenges caused by the outbreak of the virus. But of great concern is the effect on crop production output and its quality. This is due to the Covid-19 epidemic having a detrimental impact on soil fertility, harvest time, and essential agriculture inputs including the provision of fertilizers and pesticides. (Seleiman, Selim, Alhammad, Alharbi and Juliatti, 2017). As a result of the Covid-19 pandemic in Nigeria, labor shortage delays some of the agricultural practices such as sowing and harvesting time, fertilizer application, irrigation and weed control which led to drastic reduction in crop output. Similarly, outbreak of Coronavirus (Covid-19) impacts negatively on farm inputs distribution as there was no readily free movement of commercial transport to convey agricultural raw materials from point of sales to where they are needed in the entire nation which was associated with poor food quality and low output.

Alharbi and Juliatti, (2017) reported that during the lockdown period prompted by the COVID- 19 pandemic, movements of people were restricted even in the interior and remote villages. The lockout had an impact on almost all of the food supply's connections. Production was crippled because the farmers could not go to their farms and those that were able to go could not cultivate large areas as before because of the shortage of labor. Those who planted large expanses of food crops failed in the nurturing (fertilizing and weeding) of the crops to maturation thereby leading to low output. Another major risk the pandemic lockdown brought upon farmers is an increased cost of production and production inputs (seeds, pesticides, fertilizer) leading to the abysmal output of crops, and a loss of efficiency due to the high cost of transportation as a result of travel restrictions.

Takeshima and Adesugba (2020) reported that disruptions in input supply chains, labor movement, and transport restrictions can have significant negative effects on the agriculture sector. Crops are planted in the majority of Nigeria around April or May, with some crops being planted as late as June in Northern Nigeria with follow-up activities of weeding and harvesting. With the epidemic, the disruptions of these activities, especially planting and supply chains due to lockdown measures, affected agricultural activities which lowered agricultural output during the year 2020. According to Funmilayo (Pennings, Ozili, 2020) the lockdown measure and restriction of movement during the devastating pandemic brought about a shortage of labor for agricultural production. Daily

physical agricultural work is performed in Nigeria due to the lack of mechanized farming equipment. An annual spike in agricultural activity necessitates a high need for labor, but due to the lockdown and travel restrictions, farmers and laborers had less access to farmland. As a result, fewer people were available to work in agriculture, which decreased agricultural productivity across the nation (Funmilayo et al., 2020). It is against this background that this study seeks to provide the answer to the given questions: What are the socio-economic characteristics of farmers in Delta State? How will the consequences of covid-19 on agricultural activities in Delta State be rated? What is the effect of COVID19 on agriculture production? and What are the nexus between COVID19 and food security in the study area?

The Study Area And Methodology

The Study Area and Population

The local government area of Ika North East in Delta State, Nigeria, served as the study's location. **3.2 Sampling Technique**

A multi-stage sampling procedure was used in selecting the respondents. The first stage was a purposive sampling of eight towns and villages from Ika North East LGA. The second stage was a random sampling technique of three clans from the LGA. The third stage was the proportionate use of random sampling techniques in selecting farmers. 10 farmers were selected from each of the 3 towns which amounted to 150 respondents for the study.

3.3 Data Collection

Both primary and secondary data were used for the study. Primary data were collected through the use of questionnaires. The questionnaire consists of information on the socio-economic characteristics of respondents, the influence of COVID-19 on agricultural productivity, the impact of COVID-19 on agricultural activities, and the connection between COVID-19 and food security in the research area while secondary data was sourced from relevant materials published and unpublished.

3.4 Method of Data Analysis

The analytical tools that were used in the study include descriptive and inferential statistics. Descriptive statistics such as frequency count, mean and percentages were used to Examine the socio-economic characteristics of farmers and to describe the agricultural

activities of peasant farmers in the study area. Simple linear regression model was used to determine the effect of COVID19 on agricultural production. The multiple regression model is explicitly presented thus:

Y= f (X1, X2, X3, X4, X5, X6, X7, X8, X9….U)

Where

Y= Output

X1= Education (No of years)

X2= Age (Years)

X3= Sex (Male=1, Female=0)

X4= Marital Status (Married= 1, Otherwise= 0)

X5= Family Experience (Years)

X6= Household Size (No.)

X7= Farm Size (Ha)

X8= Distance to farm (Km)

X9= Cost of production (Naira)

In other to ascertain the relationship between COVID19 and food security a logistic regression analysis was conducted. The explicit form of the model can be stated as:

Fi= β0+β1Ϭ1+ β2Ϭ2 +β3Ϭ3+ β4Ϭ4+ β5Ϭ5 + β6Ϭ6+ β7Ϭ7+ ei

where Fi = level of covid-19

Ϭ1 = cost of food (#)

Ϭ2 = quantity of food consumed

Ϭ3 = quality of food consumed

Ϭ4 = type of food consumed

Ϭ5 = number of meal per day

Ϭ6 = availability of food

Ϭ7 = Income of farmers

Results And Discussion

4.1: Socio-economic Characteristics of Respondents

The socio-economic characteristics of correspondents considered in this study were sex, age of respondents, marital status, level of education, household size, farming experience

Table 4.1: Socio-economic Characteristics of Farmers(n = 150)

Variables	Category	Frequency	Percentage
Sex	Male	84	56.0
	Female	66	44.0
Age of respondents	Less than 30years	6	4.0
	30-39	39	26.0
	40-49	39	26.0
	50-59	57	38.0
	60years or more	9	6.0
Marital Status	Single	21	14.0
	Married	102	68.0
	Divorced	27	18.0
Level of education	No formal education	33	22.0
	Primary education	30	20.0
	Secondary education	69	46.0
	Tertiary education	12	8.0
	Others	6	4.0
Household Size	1-3	27	18
	4-6	93	62
	7-9	30	20
Farming experience	Less than 10years	42	28
	10-19	48	32
	20-29	33	22
	30-39	18	12
	40-49	3	2
	More than 50years	6	4
Farm size	0.1-0.2ha	3	2
	0.3-0.4ha	12	12
	0.5-0.6ha	64	42.7
	0.7-0.8ha	30	20
	0.9ha or more	41	27.3

Table 4.1 showed that 56.0% of the farmers were male. This implies that more males were into farming than females, the reason being that males engage in farming as a hobby or main occupation than females who usually engage in trading and household chores; 56% of the correspondents were within the age range of 30-49. This implies that the majority of the correspondents were young people that are strong and active and could carry out agricultural production in the neighborhood. However, 44% of the correspondents were within the age range of 50-60 and above. The result showed the majority of the farmers are within their economic active years. Hence, they have a determining effect on the food security status of the study area. On the marital status of the farmers, the result showed that 14.0% of the farmers were single and 68% were married, this could be attributed to the fact

that singles (mostly youth) preferred white-collar jobs rather than engaging in farming. While 18% were divorced.

On the educational level of the farmers, the result showed that 58% of the farmers had formal education while 22% had no formal education. However, 20% of the correspondents had their first school leaving certificates. From the result above, it could be concluded that most of the correspondents were educated and as such, they are imbued with the ability to access and appreciate the use of improved technology and best practices in their enterprise. The household sizes of the farmers in the study area as presented above showed that 80% of the correspondents were within the household size of 1-6 while 20% of the correspondents were within the range of 7-9. Therefore, it may be concluded that most of farmers have a household size that is relatively average or medium and they can supply the required labour for their farming.

More so, Table 4.1 also showed that 60% had farming experience within the ambit of 1-19 years while 34% of the correspondents had farming experience in years of 20- 39 years. However, the lowest percentage (6%) of the correspondent farming experience was recorded in those 40 and above. This implies that many of the farmers have an experience that enables them to tackle problems in farming and adopt improved farming technologies. Farm size, from Table 4.1, indicated that 14% of the correspondents had a farm size range of 0.1-0.4ha, while 62.7% of the correspondents had a farm size range of 0.5-0.8ha and 27.3% of the correspondents had a farm size range of 0.9ha and above.

4.2. Agricultural Activities of Respondents

Table 4.2 shows that 58.0% of farmers are into crop farming, 43.3% are into livestock farming, 88.0% are mixed farmers, 21.3% are into artisanal and 52.0% are into trading. It could be seen that most of the farmers are mixed farmers

Table 4.2: Showing the agricultural activities of the farmers

Variables	Frequency	Percentage
Crop Farming	87	58.0
Livestock farming	65	43.3
Mixed farming	132	88.0
Artisanal	32	21.3
Trading	78	52.0
Total	150	100

Source: Field Survey Data, 2022

4.3. Constraints Faced by Respondents

Variables	Frequency	Percentage	Ranking
Inadequate transport facilities	132	88.0	3rd
Lack of funds (credit)	143	95.3	2nd
Labour unavailabili ty	87	58.0	7th
High prices of inputs	123	82.0	4th
Spoilage of products	74	49.3	8th
Pest & diseases attack	97	64.7	5th
Restriction/lockdown	149	99.3	1st
Inadequate storage facility	89	59.3	6th
Total	150	100	

The result obtained from Table 4.3 showed the percentage of farmers who encountered challenges in their production during the Coronavirus pandemic. The challenges are further discussed below:

Restriction/Lockdown: Lockdowns and restrictions on people's freedom of movement together contributed to decreased economic power, labor scarcity for agricultural output, and significant losses in the industry.

Lack of funds (credit): The low yield of agricultural production is compounded by access to finance at the right time which made it difficult to guarantee food sufficiency and security.

Inadequate transport facilities: The poor transport system caused large quantities of painstakingly farmed produce to be laid to waste. The farmer is left disappointed when the harvest is plentiful because his produce cannot be reached beyond the boundaries of his town and can't reach the consumer at a reasonable price and within a reasonable time.

High prices of inputs: Rise in input prices made it impossible for some farmers to buy them and chose to do without or with less of them. This caused low yield and in turn, reduced food availability and farmers' income.

Pest & diseases attack: Pest and disease attacks experienced by the farmer caused untold damage to crops and livestock which led to the loss of revenue due to damage.

Inadequate storage facility: The farmers lack adequate storage facilities to preserve or convert excess farm produce into another form. This necessitated the wastage of a reasonable proportion of agricultural harvest and forced them to dispose of them when prices were low by getting little returns.

Labour unavailability: Labour is an essential part of any agricultural production system and the shortage resulted in a decrease in the output of agricultural production and lost economic earnings for farmers.

Spoilage of products: Food quality and shelf life are significantly impacted by food degradation brought on by spoilage bacteria during storage and distribution. It directly impacts the farmer through foregone income.

4.4. Summary of regression result of the socio-economic characteristic

The different socio-economic characteristics and other factors that could affect agricultural production and food insecurity were determined through employment of multiple regression analysis. The R^2 value of 0.975 implies that about 98% of the alterations in agricultural productivity were caused by the changes that were entered into the model. It also implies that about 2% of the changes in production were caused by other factors which were not listed in the model. The details of the variables, coefficients, standard errors, t-values, and level of significance are presented in Table 4.4

Table 4.4: Determinants of Food Security and Agricultural Production

Model	Coefficient	Std. Error	t-Value	Significance
Constant	114.061	85.956	5.132	.005
Age	-7.287	3.517	-12.189	.000
Household size	104.552	6.353	2.085	.080
Educational level	31.387	4.214	.301	.764
Cost of production	.908	.039	23.219	.000
Farm size	257.490	7.586	3.452	.001
Distance	-2.882	9.512	-.073	.942
Farming experience	-28.626	6.408	3.474	.007
Covid -19 pandemic	-789.512	8.409	-2.086	.039
Sex	169.626	43.564	.494	.622
R	.987a			
R Square	.975			
Adjusted R square	.973			
F stat	472.96			

Age of Respondent: Table 4.4 shows the existence of a negative significant nexus betwixt the age of agricultural practioners and agricultural production at a 1% probability level. This implies that the older the farmer, the lower the production in the study area.

Household Size: The household size had a positive significant relationship with food security and agricultural production at a 10% probability level. The positive value

indicates that the higher the household size, the higher the production.

Cost of Production: At a 1% probability level, the cost of production for responses is statistically significant. It has been signed favourably. This conclusion shows that a 1% rise in production costs leads to an increase in agricultural output.

Farm Size: At a 1% probability level, the results in table 4.4 demonstrated that it had a positive connection with food security and output. A positive number suggests that increasing farm size will boost agricultural productivity. The findings in consonance with Edoja *et al.,* (2021) findings which indicated that large farm size will boost food security in the south-south region of Nigeria

Farm experience: The farm experience of the respondents is negatively significant at a 1% probability level. This implies that farmers with more experience had low output.

Covid 19 pandemic: Covid-19 outbreak more than being was also negatively correlated with food production at a 5% probability level. The negative value indicates that a rise in Covid-19 outbreaks and lockdowns led to a decrease in food production.

Conclusion And Recommendation

5.2. Conclusion and recommendations

The study investigated the effect of the coronavirus pandemic on food security and agricultural production in Ika North East Local Government Area, Delta State. From the response of the respondents which was revealed in the study findings, it is affirmed that the pandemic greatly affected the food production in the study area. The study further affirms that the major challenges that affected food security and agricultural production in the study area range from restriction/lockdown, lack of funds/credit, inadequate transport facilities, and high prices of inputs. Therefore, farmers should be given access to loans, incentives, and extension services to bolster food production and security.

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