



EXAMINING THE EFFECTS OF COVID-19 ON HOUSEHOLD FOOD SECURITY STATUS AND COPING STRATEGIES ADOPTED DURING LOCKDOWN PERIOD IN KANO, NIGERIA

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Abstract

Poverty and food security challenges go hand in hand; however, as the COVID-19 pandemic goes global, poverty and food security challenges deteriorated to a new level. Before the epidemic, an estimated 2 billion people were projected to be food insecure in the world. However, with COVID-19 pandemic, the figure is expected to be much more than the projection. The purpose of the study is to examine the effects of COVID-19 on household food security status and the coping strategies adopted during the lockdown period in one of the most populous location in Nigeria, which is Kano. Food Security Index (FSI) shows 54 per cent of the households in Kano, Nigeria, are food insecure with a food security index of 0.66 and per capita daily calorie intake of 1,789.51 kcal. Disaggregating the households according to regions, show that households from Kano south are more food insecure than in Kano north or Kano Metropolitan. Results from the coping strategy index also reveal that the average CSI in the study area is 61 indicating a severe food security challenge due to COVID-19 measures. Disaggregating the CSI further into regions shows that Kano south has the highest average CSI in Kano, Nigeria. Analysis reveals that government and indigenous private business individuals and organisations are not doing enough during the lockdown period, therefore the need for more effort especially among households in Kano south where the number of food-insecure households is the highest. The government also needs to take responsibility and accountability of the palliatives given to the households in Kano, Nigeria.

Keywords: Covid-19, Calorie, Disaggregating, Palliatives, In-Context.

1. Introduction

The challenges faced by the world as a result of food security are shaping into a new and different dimension with Corona Virus Disease 2019 (COVID-19) pandemic. According to Food and Agricultural Organisation (FAO); International Fund for Agricultural Development (IFAD); United Nations Children Emergency Fund (UNICEF); World Food Programme (WFP) and World Health Organisation (WHO) and in line with Sustainable Development Goals (SDGs) indicator 2.1.2, it is estimated that about 2 billion individuals will be facing some form of food insecurity challenges in the world by 2019. This comprises both moderately and highly food insecure people (FAO et al., 2019). An estimated 676 million people, out of the total 2 billion people are in Africa; About 1 billion are found



in Asia, while an estimated 89 million are found in Northern America/Europe (FAO et al., 2019). In Africa, a projected 70 million people are residing in Northern Africa, while about 606 million people are living in Sub Saharan Africa (SSA) by the end of 2018 (FAO et al., 2019). Some of the reasons for such a vast number of hungry people in the world especially with the variation include conflicts and displacement, urbanisation, climate change, extreme poverty and gender inequality (FAO et al., 2019). However, one serious pandemic that is taking the world by storm and seriously affecting the household's food security status, which the world has not put into consideration, is COVID-19.

Previously, known as novel Coronavirus disease (2019) which relates mostly to Acute Respiratory disease or Syndrome caused by β -coronavirus or Coronavirus-2 (SARS-CoV-2), the virus originated from Hubei Province of China in the city of Wuhan in December 2019 when WHO reported a mysterious Pneumonia in the city (Zhu et al., 2020; Li et al., 2020). The virus quickly circulated all over the universe with the speed of light; consequently, becoming a global pandemic by March 11, 2020, recording over three (3) million cases and over 208,000 death among 213 countries and province (WHO, 2020a). According to Organisation for Economic Co-operation and Development [OECD], (2020) uncertainty is extremely high concerning the full scale of the pandemic in African continents due to underreporting of cases and accuracy in term of data collections in the regions. However, various governmental organisations have adopted measures to control the pandemic, which include social distancing, schools' closure, discouraging large gathering of individuals, restriction of travelling.

Over 52 African countries have recorded Covid-19 cases with Egypt having the experience of first case on February 14, 2020 (WHO, 2020b). In Nigeria, the origin of COVID-19 infection can be traced back to 27th February, 2020 when the first index case involving an Italian national was recorded in Lagos. By 27th March the country marked 27 suspected cases from five (5) States including Kano State, even though without any death. As at 16th June, total confirmed cases in the country was 17,148 and reported deaths of 455. Kano recorded total confirmed case of 1,158 with 50 deaths out of tested samples of 8,432 as at 16th June 2020 (National Centre for Disease Control [NCDC], 2020). According to Gilbert et al. (2020), the more the tests, the likelihood of recording higher cases, generally Nigeria has a modest risk and variable capacity to control the COVID-19 outbreak.

COVID-19 has a direct relationship with food security, in that the origin of the virus is directly from the food system traced to wet market of Wuhan city in China, which deals in a wild animal. The pandemic is presently threatening the food security of billions of people in addition to the already existing challenges of food security highlighted earlier, even though it was assumed initially that the pandemic would not affect the global food security (Vos, Martin & Laborde, 2020). In the same vein, De Sousa (2020) observed that currently there is a serious warning concerning the number of hungry people that may be affected by the pandemics, mostly as a result of the destruction of the food supply chains, running or almost doubling the present figure. WFP estimate that by the end of 2020, the number of



people that will face acute food insecurity due to COVID-19 will be twice as many as before the COVID-19.

Zurayk (2020) observed that the pandemic has a negative impact with all the four fundamental dimensions of food security as defined by FAO (2003) which include availability, accessibility, utility and stability, which will further affect the sustainability of food security in the world. With no approved treatment of COVID-19 presently, the virus is severely impacting both national healthcare system as well as socio-economic stability in the world (WHO, 2020b). For instance, according to Evenlyn (2020), healthcare system in terms of quality and economic inequality has resulted in the death of numerous black American, while Galea (2020) observed that poor and marginalised will be severely hit by COVID-19 pandemic in the world and the USA in particular.

The World Bank (2020c) estimated that 60 million individuals living on less than US\$2 per day would be forced into extreme poverty as a result of the COVID-19 pandemic lockdown under the worst-case scenario. While in the best-case scenario, an estimated 49 million people will be forced into extreme poverty due to COVID-19. This is due to shut down in economic activities all over the globe. Already the most deprived people have started feeling the impacts of the pandemic with migrant workers across the world losing jobs, this will subsequently, affect the flow of remittances by at least 20% downward globally or about US\$100 billion will be lost due to remittance in the world in 2020 alone, which will also affect the food security (World Bank, 2020b).

The pandemic will also cause billions of people in Africa to become destitute. People from SSA will suffer the most impact, with about 39 countries out of the 100 countries found in the SSA, and a projected 23 million people living in SSA heading to extreme poverty in the region alone. South Asia might likely suffers from the same fate, with about 16 million people forced into abject poverty. In comparison, India is expected also to have an estimated 12 million people forced into extreme poverty. Nigeria and Democratic Republic of Congo each will have 5 million and 2 million people forced into abject poverty (World Bank, 2020c).

Several African nations have employed various economic and social support programmes. Unfortunately, the reality is less than 20 per cent of the African population are formally employed, with no social security system in place for those in the informal sector. Most of the countries in Africa are very poor in term of national coffers even before the COVID-19 pandemic. Therefore, there is the need of international communities to step in to assist the African continents in fighting the epidemic; subsequently, writing off some of the already existing debts will go a long way in reducing the problems (World Bank, 2020a).

Recent National Bureau of Statistic (NBS) report stated that more than 83 million people in Nigeria are poor, which translated into 40.1 per cent of the total population. This also means that for every ten (10) people at least four (4) people are poor with a yearly real per capita expenditure estimated at below N137,430 (US\$381.75) by the national standard. The report furthermore states that individual monthly income from the above category is



estimated at N11,500 (US\$31,94) with a daily income of less than a dollar N38.00 (NBS, 2020). Accordingly, poverty head count in Kano is estimated to be 55.1 per cent which is clearly above average or the national standard in the country (NBS, 2020). This deplorable state of poverty estimation was without the impact of COVID-19, which when compared with the rate of poverty will be much bigger than the above figure (NBS, 2020). World Bank report further stated that, 43 per cent of the poorest people are residing in Nigeria (World Bank, 2020a).

COVID-19, in general, affected the economic activities and subsequently increased the costs of food items. Annual inflation in the country has risen for straight eight-month peaking up in April as a result of the spread of COVID-19, which resulted in higher food prices throughout the country due to lockdown in economic activities. The inflation rate was 12.34 per cent which represents the highest level in more than two (2) years in the country (NBS, 2020); this is in addition to the current rate of unemployment and low level of livelihood in the country even before the COVID-19 pandemic. The country is all set for a recession which will also affect the status of food security of households.

Empirical evidence of the impact of COVID-19 on food security status in the world is presently very few. The virus has a devastating effect and can easily affect the food security status of households either directly or indirectly. Reports have shown that 60 per cent of the deaths witnessed in the early stage of the pandemic in Kano is linked to COVID-19, especially among the elderly household heads. The pandemic has also resulted in distorting the food supply chain in Kano, which also affects the food security status of households, subsequently, doubling the prices of some staple foodstuffs in the State. On the other hand, the stringent measures put in place by the government to control the spread of the virus further compounded the issue of food security status of households in Kano. The study is the first of its kind in Kano, Nigeria. The paper will also assess the status of food security and coping strategies adopted by the households due to the lockdown as a result of COVID-19 in Kano, especially the impact of palliative and other government support to individual households in Kano.

2. Literature Review

Hossain (2020) investigated the impacts of COVID-19 on Agri-food sector: food security policies on member countries of Asian Productivity Organisation (APO), using publicly accessible information. Findings show that short-term, medium-term and long-term challenges in food security due to COVID-19 have a different degree of impact among the member countries. The longer the pandemic containment measures continue, the more challenges faced in the recovering process will be for ensuring smooth accessibility in terms of food production of staple food and nutrition among the member countries as well as the trade relationship.

Galanakis (2020) investigated the food systems during COVID-19 pandemic crisis. The study's objectives are to provide information on bioactive components of food and herbs



that assist human immune system against COVID-19 infections, identify the global food security challenges as a result of COVID-19 contentment of lockdown and stress the significance of sustainability in the food chain to reduce the frequency of food security and healthcare system crises in the world. Nouh, Elfagi and Omar (2020) also studied the paradox between food insecurity and weight gain by providing a conceptual proposal joining weight gain and food insecurity amid COVID-19 outbreak.

Deaton and Deaton (2020) investigated food security and Canada's agricultural system challenged by COVID-19. Using the Household Food Security Survey Module (HFSSM) the Canadian Community Health Survey (CCHS), the study observed that there is a noticeable increase in demand and supply chain disturbances without broad, speedy appreciation in food prices indicating lack of adequate supply of food in the near future. The finding further reveals minimal certainty over the medium and long term due to numerous factors which are instability, especially the rate of the spike in the sickness of death globally and the country.

3. Methodology

The research was conducted in Kano, Nigeria, which has a total surface area estimated approximately at 20,400 km² and considered as one of the most populous cities in the country with population estimated at 9,401,288 people according to the recent population census (National Population Commission [NPC], 2006). With an estimated annual growth rate in a population of 2.8 per cent, the population figure is expected to be around 12,626,500 as in 2015 (NPC, 2016; NBS, 2016). The State lies in the northern part of the country, sited in the northwest region, with an estimated annual rainfall ranging 600-1,200 mm from the Northern Guinea Savannah and an expected rainfall of 300-600 mm from the Sudan Savannah. On the average, rainfall estimated around 840 mm running for approximately for three (3)–Four (4) months duration depending on the location. The average annual temperature ranges from 30⁰C – 45⁰C with the maximum temperature running normally from February to May every year (NBS, 2012).

The unit of the study is the household head which can either be a male-headed or a female-headed household. The sampling procedure employed was multistage stratified non-probabilistic sampling method involving four stages. In the first stage, Kano is stratified into Kano urban and Kano rural. Secondly, further stratification was conducted to stratify Kano rural into Kano north and Kano south. At the same time, Kano urban was classified as Kano metropolitan. This is to enable the research to have a more comprehensive coverage among the households in the State.

The State has a total number of 44 Local Government Areas (LGAs). Kano metropolitan has eight (8) LGAs, Kano north has 17 LGAs, while Kano south has 19 LGAs. In the third stage, two (2) LGAs (Gwale and Kano municipal) were selected from Kano metropolitan. At the same time, four (4) LGAs each from Kano north (DawakinTofa, Gwarzo, Karaye&Kunchi) and south (Kura, Sumaila, Gaya &Wudil) were selected, making a total of 10 LGAs for the study.



According to the recent Census in the State, there are about 1,603,300 regular households in Kano (NPC, 2006). A total of 426 regular households were selected for the survey. Fifty (50) respondents each from Kano metropolitan and 325 respondents from Kano rural (164 regular households from Kano north and 161 regular households from Kano south) were selected. The fourth stage involved selection of households from wards in each LGA selected from the regular households with a maximum of 5 wards.

A questionnaire was distributed to the respondent household heads, which comprises both farming and non-farming household heads. The questionnaire was designed to achieve the objectives of the study, which include the socio-economic characteristics of the household heads adopted from Action Against Food (ACF) – Food and Security and Livelihood Assessments, with a slight modification to suit the communities in the study area. Questionnaire on the Coping Strategy Index (CSI) was adopted from Feinstein International Centre, Tufts University and TANGO (2008) also with a slight modification to accommodate some of the strategies adopted by the household heads in Kano especially, during the COVID-19 lockdown.

The data collection took about two months to collect from the time of the first State lockdown in April-Mid June 2020. Five (5) research assistants were employed to assist in the administering of the questionnaire.

Food Security Index (FSI) and In-Context Coping Strategy Index (Original CSI) were used while analysing the food security status of the households. The FSI was selected because it is simple and easy to convert the calorie consumption of households and compared it with the recommended calorie requirement, especially in a low-income country like Nigeria. The index also uses the food consumption pattern of each household in the study area. At the same time, In-the-Context CSI has the flexibility to accommodate additional coping strategies and measure their impact or relevance during COVID-19 lockdown.

Food Security Index

Food Security Index (FSI) measures individuals and household calorie intake. FAO recommended an average daily individual calorie intake based on country and province of the world. The organisation further suggested an average calorie consumption per day of 2,710 kilocalorie (kcal) for an individual in Nigeria. A household with a daily average (per capita) calorie consumption of 2,710 kcal or more is food secure. In comparison, average calorie consumption below 2,710 kcal the household is then considered food insecure (FAO, 2017).

The index involves two procedures, the identification and aggregation. Setting up and recognising the minimum nutritional level that is required to sustain a nutritious level is known as identification. This level is the line of food security level, which defines a household as food secure when equal or above one (1) or food insecure if the level is below one. The aggregation procedure, on the other hand, is the total recommended average daily calorie obtained for a household after considering the adult equivalent (FAO 2016).



Daily per capita calorie requirement or daily average calorie requirement is calculated by demarcating the household's members into different age group since each diverse group have different calorie requirement, which then is converted into Adult Equivalent Scale [AES] (Stefan & Pramila, 1998). Table 1 shows the average adult adjusted scale as recommended by the joint report of FAO, WHO and United Nations University [UNU] Expert Consultation (FAO, 2004) also adopted by Stefan and Pramila (1998) and Mukhtar, Kamaruddin and Applanaidu (2018a).

Table 1: Average Daily Calorie Recommendation/ Factor Conversion

Age (Yrs) Category	Average Daily Calorie	Factor Equivalent
Children less < 6 Yrs	813	0.30
Children 7-18 Yrs	1,897	0.70
Adults Above 18 Yrs	2,710	1.00

Source: Mukhtar et al. (2018a)

The total calorie requirement of each household is derived by taking the aggregate total number of adult equivalent and then multiplied by the country's recommended daily calorie per capita. For instance, a household with four (4) children under the age of six (6) years, the adult equivalent will then be [6 children *Adult Equivalent 0.3 = 2 adults]. Hence calorie requirement for the 6 children under the age of 6 years will then be [2 adults*2,710 kcal = 5,420 kcal] (Mukhtar et al., 2018b; Mukhtar, 2020a; Mukhtar, 2020b). The procedure is then repeated for each age group in the household to obtain the total summation of the total calorie requirement for all three categories for the entire household. The per capita calorie requirement for the household is obtained by dividing the total adult equivalent in the household.

Households' daily calorie intake or consumption depends on the household's own food production, foodstuff purchased for household consumption, food from other sources different from own production and foodstuff purchased for consumption purpose. Household food consumed was obtained for a week and converted into a daily average in the form of the kilogram. The total quantity of food consumed in kilogram (energy per kilogram) was determined using Oguntona and Akinyele (1995) in Appendix 1, which when multiplied by the energy content will give the total kcal of each food consumed daily. Therefore, FSI is given as follows:

$$\chi = \frac{Y_i}{R} \dots\dots\dots 1$$

where χ is the household food security status which can be one (1) or above as household being food secure or below one (1) as a food-insecure household. Y_i represents the daily per capita calorie intake/consumed of i^{th} household, while R is the daily per capita calorie recommendation in a household in Nigeria set up by FAO.

The difference between the outcome of the index indicates either the shortfall or surplus index. The shortfall evaluates the magnitude to which household is food insecure, therefore



the higher the shortfall, the more severe the food insecurity in the household, while the surplus indicates the extent of the comfortability in terms of food security, the bigger the surplus, the more household are food secure. The index in terms of shortfall or surplus is given as follows:

$$A = \frac{1}{m} \sum_{i=1}^m H_i \dots\dots\dots 2$$

$$H_i = \frac{Y_i}{R} \dots\dots\dots 3$$

where m defines the quantity of households classified as food secure or food insecure, H_i is the per capita calorie intake deficiency or surplus. Household head count ratio identified the percentage of the households' food security status (food secure or food insecure) and is given as follows:

$$\pi = \frac{m}{n} \dots\dots\dots 4$$

where n is the total number of the sampled households in the study area.

Coping Strategy Index

According to the Food and Nutrition Technical Assistance [FANTA], (2003), Coping Strategy Index (CSI) measures the different consumption patterns espoused by the household for the duration of a food shortage or inadequate access to food over time. The index comprises numerous questions on how best household fare the food shortage capture in a simple score. The index is built based on the outcomes to a single question "what happens when there is enough food consumption, but the resources to purchased are the constraint?" The index is suited to serve as a tool during emergencies situation, especially when other tools fail or unpractical. Therefore, CSI measures the number of events happening (frequency) and the structural adjustment made by the household in terms of food consumption. The index achieved the following purposes: provide the extent of food security challenges quick and fast, assess the impact of food assistance programmes, provide an early signal of an impending food crisis and point the causes of malnutrition and the location in dire need of food assistance (FANTA, 2003). In summary, CSI determines whether food security challenges in a household is increasing or decreasing (Maxwell, 1996).

Two adaptable strategies were identifiable in a household whenever faced with issues of food security (FANTA, 2003; Mukhtar, 2019c; Mukhtar, 2020b). Firstly, the short-term consumption adjustment and the long-term adjustment in income generation capacity, production patterns and one-time solution in household's resources like disposal of assets to purchase foodstuff or using of business capital (FANTA, 2003). Under the short-term strategy, household immediately change consumption pattern the moment there is the slightest indication of shortage in terms of food consumption and might not wait for the situation to escalate, this accordingly indicates a problem with food security in a household (Maxwell et al., 1999). Long-term strategies show a deteriorating food security challenges



in a household, hence the tendency of adopting strategies that considered to be severe and irreversible, which subsequently resulted in critical and severe food security challenges (Devereux, 1993; Mukhtar, 2019a; Mukhtar, 2020b).

According to FAO (2008), households adopt four (4) kinds of consumption adjustment patterns whenever faced with food security challenges. However, the severity may likely differ from one household to the other. These strategies include the following: Firstly, dietary plans trade-offs, shifting from most preferred food to less and sometimes cheap foodstuff; changes in food stock through short-term strategies considered unsustainable for instance, borrowing or purchasing food on credit or sometimes adopting severe strategies like begging or eating wild foods, immature crop or stock of seeds; reducing the number of household members to another place to allow for available food in the household and rationing of food available to the household.

CSI is measured using two (2) approaches, namely In-Context or Original CSI and Comparative/Reducing CSI (Universal Approach). The underpinning assumptions are based on the fact that the general question and the corresponding responses must strictly be on the right list of coping behaviours prevailing in the study area; the frequency of the behaviours used in the recent time and the severity of each strategy specified (FANTA, 2003). Since there is COVID-19 and various measures are put in place to reduce infections, especially the lockdown in the State, numerous coping strategies are put forward by various households in Kano; this prompt the adoption of In-Context CSI. The advantage of this approach is the flexibility of identifying the existing strategies available. Specifically, the study wants to assess the impact of palliative measure put in place by the government to reduce the suffering of poor households in the study area.

The approach weighted a given frequency consumption pattern habits based on the severity of the pattern, which is then summed up to all the consumption behaviours in the list as obtained from the study area, which is the first pillar. The aim is to provide the status of food security in both the present condition and the future, subsequently the higher the score of the index, the higher the level of coping strategies is expected and the higher the challenges faced by the households in term of food security (FANTA, 2003). The second pillar is to identify and rank the severity of the coping strategies in line with households' responses, with ranges from 1-less severe coping strategy – 4- highest coping strategies (Maxwell & Caldwell, 2008).

4. Results

Descriptive analysis from Table 2 shows the socio-economic profiling of the household heads from the study area. There is a total of 425 household heads; about 85 per cent are headed by a male, while 15 per cent are headed by female household heads. The average age among the household heads is estimated at 41 years. The average age among household heads indicates that the household heads are in their productive age, which is a good signal for achieving food security status. In terms of marital status, 89 per cent are married, 3 per cent are divorced, and 8 per cent are widowed. The average household size in the study



area is estimated at ten (10) individuals per household, comprising six (6) children under the age of 18 years, while an average of four children in school and four (4) adults individuals. Households' response further stresses that COVID-19 has impacted negatively toward children education since school are close to control the pandemic. However, an astonishing outcome of the survey is that majority, or 65 per cent of the respondents believed that COVID-19 is purely a hoax and only a means through which government can mobilise assistance locally and internationally.

In terms of household classification, an estimated 60 per cent are farming household, while 40 per cent are non-farming household. Average farming experience among the farming households is estimated at 31 years, while average cultivable land is estimated at four-hectare (4ha). Land ownership structure reveals that majority or about 64 per cent are inherited/family, 25 per cent privately owned, while 2 per cent and 9 per cent are community and rented land respectively. In term of labour contribution in farming, about 67 per cent are hired labour, while 33 per cent are family labour. However, evidence has shown that most of the farmers are affected by the lockdown, which will subsequently distress the status of food security in Kano, Nigeria in future.

Educational background from Table 2 reveals that about 13 per cent have a non-formal education; 18 per cent have a primary school certificate, an estimated 20 per cent have SSCE/GCE. In contrast, 30 per cent and 16 per cent have NCE/OND and Bsc/HND, respectively. Only 5 per cent have M.Sc./Ph.D certificate. In term of occupation, majority or about 50 per cent of the household heads are into Public sector employment, about 11 per cent are into the private sector, while 39 per cent are into the farming sector. Although there is no evidence of loss of job from the public sector employment, about 43 per cent of the household heads under the private sector employment indicated a loss of employment and subsequently a slight reduction in both income and food security status by the affected households. However, majority of the public sector employees reported a reduction in income earned effectively from April 2020 because the government has reduced salary of all the employees of 20 per cent – 30 per cent depending on the grade level. This finding is in line with recent results by NBS (2020) which stated that about 42 per cent job lost due to COVID-19 in Nigeria and that the impact is severe in commercial, service and agriculture. Also, according to United Nations Economic Commission for African [UNECA], (2020) even though Africa will be accounted for an insignificant percentage of people affected by the pandemic in terms of death, however, it is estimated that the continent may as a result of COVID-19 lose more than 60 million jobs if total lockdown is implemented in the continents.

Average monthly expenditure among households is estimated at N115,000 (US\$319), while average households' income is estimated at N132,000 (US\$367) monthly. Findings from the NBS (2020) reveal that 79 per cent of the Nigerians have reported a significant reduction in both household income and expenditure since mid-March 2020. While purchasing staple foodstuffs by households is becoming harder by the day. Both average income and expenditure are also in line with findings by World Bank (2020) that a large



number of individuals are surviving on less than US\$1.90 (N684). Since each household has an average of ten (10) individuals and that average monthly expenditure is estimated at N115,000 (US\$319) it will translate into a daily household expenditure of N3,800 (US\$11) and daily individual expenditure of N380 (US\$1.06). Although previous researches have reported a slightly different income and expenditure by households in the study area, however, this finding indicates that COVID-19 is impacting on the income and expenditure of households in the study area. Also, the State government has reduced the salary of the public sector employees ranging from 10 per cent – 30 per cent depending on the grade, effective from May 2020.

Farming households' production among farming household heads reveals that about 90 per cent of the production annually goes to market for sale, which translates into an average of N1,081,000 (US\$3,003). The farming households consume about 6 per cent of the total annual production, which translates into an average of N72,000 (US\$200). In contrast, 2 per cent of the yearly production is set aside for donations and seedling for the next farming season. Farming household production finding is based on the previous year output. However, most farming households are not optimistic about this year's farming production. This is, as a result of measures put in place to control COVID-19 spread among the community and individuals. Already, the farming season has since started, but farmers are still under the lockdown, while markets for raw materials also remained closed due to COVID-19 pandemic.

Table 2 Socio-economic Profiling for Farming and Non-farming Households

General Households			Farming Households		
Variable	%	Average	Variable	%	Average
Gender			Farming Experience (Yrs)		31
Male	85		Cultivable Land (ha)		4
Female	15		Land Ownership		
Marital Status			Private	25	
Married	89		Family	64	
Divorced	3		Community	2	
Widowed	8		Rented	9	
Age		41	Labour Contribution		
Household Size		10	Hired	67	
Under 18-Years		6	Farming	33	
Adults		4	Household Production		
Household Classification			<i>Consumption</i>	6	
Farming Household	60		Naira		72,240
Non-Farming	40		Dollar		200
Occupation			<i>Sales</i>	90	
Public Sector	51		Naira		1,083,600
Private Sector	10		Dollar		3,010
Farming	39		<i>Donation</i>	2	
Educational Background			Naira		24,080



Non-formal Education	13	Dollar	67
Primary School Certificate	18	Seed	2
SSCE/GCE Certificate	20	Naira	24,080
OND/NCE	30	Dollar	67
Bsc/HND	16		
M.Sc./PhD	5		
Monthly Expenditure			
Naira	115,000		
Dollar	319		
Food Expenditure	29		
Non-food Expenditure	71		
Monthly Income			
Naira	132000		
Dollar	367		

Note: Naira exchange at CBN official rate of N360/US\$1

Source: Research Survey, 2020

Analysis from the FSI is presented in Table 3. Indication from Table 3 reveals that food security index is 0.66 in the study area, clearly indicating that the Kano State is food insecure, especially during the lockdown period as a result of COVID-19 pandemic. The table also reveals that total Daily Calorie Consumption (DCC) among the households is estimated at 5,053,580.60 kcal. In comparison, total Calorie Requirement (CR) among the Adult Equivalent or households is estimated at 7,673,702 kcal. With total AE of 2,824 individuals in the study area, Per Capita Daily Calorie Consumption (PDCC) is estimated at 1,789.51 kcal clearly, below the recommended calorie requirement set by FAO of 2,710 kcal. The Per Capita Calorie Requirement (PCCR) among the AE in the study area is estimated at 2,717.32 kcal. Therefore, shortfall created from the index is estimated at 0.34, which indicates the gap that needs to be filled among the households to make the Kano food secure. On the aggregate, only 46 per cent of the households are food secure, while 54 per cent are food insecure.

Table 3: Household Food Security Index/Status in Kano, Nigeria

Description	Percentage	Kcal
Food Secure Households	46	
Food Insecure Household	54	
Total DCC		5,053,580.60
Total CR		7,673,702.00
PDCC		1,789.51
PDCR		2,717.32
Food Security Index (χ)		0.66
Surplus/Shortfall Index (α)		0.34
Adult Equivalent (AE)		2,824.00

Note: where DCC stands for daily calorie consumption; CR – calorie requirement; PDCC – per capita daily calorie consumption; PDCR – per capita calorie requirement.

Source: Field Survey, 2020



The index revealed how hard COVID-19 is impacting negatively on household’s food security status, which can subsequently result in a weak immune system to fight back the pandemic in Kano. Also, recent studies, especially those before the pandemic have shown a better food security index among households in Kano (Mukhtar et al., 2018a).

Table 4 further reveals that total DCC among the food secure households in the study area is 2,877,190.90 kcal, while total CR is 2,355,606 kcal among the households. PDCC, on the other hand, is 3,318.56 kcal and PCR is 2,716.96 kcal. The result indicates that households have surpassed the daily calorie requirement set by the FAO. Surplus index from Table 4 further reveals that the households considered to be food secure exceeded the threshold of 1 by about 22 per cent. Total AE in the study area that is regarded as food secure is 867 AE. On the other hand, Table 5 shows the food security index of households considered to be food insecure with total DCC of 2,176,389.90 kcal and total CR of 2,355,606 kcal. The PDCC is estimated to be 1,112.11 kcal, while the PCR is 2,717.47 among the total AE of 1,957 individuals. Food security index from Table 5 is 0.41, with food shortfall estimated to be around 0.59.

Table 4: Food Security Index for Food Secure Households in Kano, Nigeria

Description	Kcal
Total DCC	2,877,190.90
Total CR	2,355,606.00
PDCC	3,318.56
PDCR	2,716.96
Food Security Index (γ)	1.22
Surplus/Shortfall Index (α)	0.22
Adult Equivalent (AE)	867

Source: Field Survey, 2020.

Food security index based on regional classifications as revealed in Table 4.4 shows that 48 per cent, 69 per cent and 31 per cent of the households in Kano north, Kano metropolitan and Kano south are food secure respectively. In contrast, 52 per cent, 31 per cent and 69 per cent of the households in Kano north, Kano Metropolitan and Kano south are food insecure respectively. This clearly shows that the negative impact of COVID-19 is much higher in Kano south and Kano north than Kano Metropolitan. Food security index from Table 7 further reveals that Kano north has an index of 0.65, Kano Metropolitan has 1.13 while Kano south has 0.49; this result further shows that Kano Metropolitan is relatively food secure during the lockdown period with a surplus index of 0.13 or 13 per cent, while both Kano north and Kano south are food insecure with a shortfall of 0.35 and 0.51 respectively. Total household DCC for Kano north, Metropolitan and south is estimated at 2,056,219 kcal, 1,371,542 kcal and 1,620,819 kcal respectively. In contrast, total CR among the households in Kano north, Metropolitan and Kano south is estimated to be 3,147,460 kcal, 1,218,958 kcal and 3,307,284 kcal respectively. With AE of 1,161, 446 and 1,217 for Kano north, Kano Metropolitan and Kano south respectively, this will translate into PDCC of 1,771.08 kcal, 3,086.42 kcal and 1,332 kcal as well as PCR of 2,710.99 kcal,



2,733.09 kcal and 2,718 kcal for Kano north, Kano Metropolitan and Kano south respectively.

Table 5: Food Security Index/Status for Food Insecure Households in Kano, Nigeria

Description	Kcal
Total DCC	2,176,389.90
Total CR	5,318,096.00
PDCC	1,112.11
PDCR	2,717.49
Food Security Index (γ)	0.41
Surplus/Shortfall Index (α)	0.59
Adult Equivalent (AE)	1957

Source: Field Survey, 2020

Further disaggregating the household based on income classification, household size and educational qualification, as shown in Table 6, majority or about 41 per cent of the households considered to be food secure are within the income range of N101,000-N200,000 (US\$278-US\$556). In comparison, the majority or about 83 per cent of the households considered to be food insecure have income level within the range of N10,000-N100,000 (US\$28-US\$278). In terms of educational background, on the other hand, majority or about 43 per cent of the households considered as food insecure have low educational qualification ranging from non-formal education, primary certificate and SSCE/NCE. In contrast, the majority, 53 per cent of households have a higher educational background. In terms of household size, the majority of the food secure households or about 71 per cent have a household size between 1-20 individuals.

Table 6: Percentage Classification of Food Security Index based on Household Income, Size and Educational Background in Kano, Nigeria

Description	Food Secure	Food Insecure
<i>Income</i>		
N10,000-N100,000 (US\$28-US\$278)	35	83
N101,000-N200,000 (US\$281-US\$556)	41	17
N201,000-N300,000 (US\$558-US\$833)	11	0
N301,000-above (US\$836-above)	13	0
<i>Educational Background</i>		
Low Educational Qualification	17	43
Middle Educational Qualification	30	34
High Educational Qualification	53	23
<i>Household Size</i>		
1-10 Individuals	71	54
11-20 Individuals	28	41
21-above	1	5

Source: Field Survey, 2020



In comparison, about 28 per cent of the food secure households have a household size of 21-above individuals. On the other hand, the food-insecure household is even among the households with 54 per cent of the food-insecure households with 1-20 individuals and 46 per cent with 21-above individuals. About 54 per cent and 41 per cent of the food-insecure households have 1-10 individuals and 11-20 individuals, respectively.

Further disaggregating the food security index into regions in Kano, as indicated in Table 7, result shows that 48 per cent, 69 per cent and 31 per cent of households in Kano north, Kano Metropolitan and Kano south are food secure with food security index of 0.65, 1.13 and 0.49 respectively. The findings reveal that only Kano Metropolitan is food secure. Also, results show that 52 per cent and 69 per cent of households in Kano north and Kano south are food insecure while only 31 per cent of the households in Kano Metropolitan are food insecure. The result revealed that Kano south is facing severe food security challenges in Kano. However, it should be noted that both Kano north and Kano south have large adult equivalent than Kano with only 446 AE.

Table 7: Food Security Index based on Regional Households in Kano, Nigeria

Description	Kano north		Kano Metropolitan		Kano south	
	%	Kcal	%	Kcal	%	Kcal
Food Secure Households	48		69		31	
Food Insecure Household	52		31		69	
Total DCC		2,056,219		1,376,542		1,620,819
Total CR		3,147,460		1,218,958		3,307,284
PDCC		1,771		3,086		1,332
PDCR		2,711		2,733		2,718
Food Security Index (γ)		0.65		1.13		0.49
Surplus/Shortfall Index (α)		0.35		0.13		0.51
Adult Equivalent (AE)		1,161.00		446.00		1,217

Source: Field Survey, 2020.

Findings from In-context CSI reveal that severity ranking among the seven (7) identifiable strategies during COVID-19 lockdown period, which include low severity and high severity. Under low severity, we have borrowing money to purchase food or purchasing food on credit, depending on government palliatives or family and friends for food, eating less preferred foodstuff and infants eating first. Items under high severity include selling assets/livestock or business capital to eat, reduction in consumption of food and skipping meals. Average frequency or the average number of days households used to depend on a strategy was also identified. Indication revealed that the highest average days is four (4) days and the least days is three (3) as shown in Table 8. Table 8 further reveals the average weighted scores for each of the adaptable strategies in the study area. Selling



assets/livestock or using existing business capital to feed, reduction in consumption of food in the household and skipping meals have the highest weighted scores of 16, 12 and 16, respectively. While others have less weighted scores and therefore are considered as less severe coping strategies. Average coping strategy weighted score in the study area is 61, which indicates that food security is a serious challenge in the area, especially regarding the COVID-19 total lockdown.

However, it should be noted that there is no one strategy adopted by households, but rather various strategies to cope with COVID-19 lockdown. Furthermore, responses from the heads of the households indicated that government palliatives of any form had not reached the poorest. In some cases wealthy individuals in the communities have impacted positively through government, but the relief materials are yet to reach the households after data collection, but this can be linked to the issue of corruptions that mere the whole exercise.

Further disaggregating the CSI into the regional area as revealed in Table 9 indicates that average CSI in Kano north, Kano Metropolitan and Kano south is estimated to be 61, 56 and 63. This showed that Kano south is in dire need of assistance in terms of food because it has the highest tendency of having a large number of food-insecure households. The findings are also in line with results from FSI, which reveals that the food security index in Table8: Average Household Frequency, Severity Ranking and Average Scores in Kano, Nigeria

Description	Average Days	Severity Ranking	Average Score
Borrowing/Purchasing Food on Loan/Credit	3	1	3
Selling Assets/livestock/Using Business Capital	4	4	16
Reduction in Food Consumption	4	3	12
Depending on Government Palliatives/Assistance	4	2	8
Eating Less Preferred Food	3	1	3
Skipping Meals	4	4	16
Children Eating First	3	1	3
Average Scores (Average CSI)			61

Source: Field Survey, 2020

Kano north is 0.41, with about 69 per cent of the AE of 1,217 individual food insecure. Furthermore, Table 9 shows that high severe coping strategies in both Kano north and south are selling assets/livestock or using business capital to purchase food, reduction in consumption of foodstuff and skipping meals. While in Kano Metropolitan, high coping strategies include selling assets/livestock or using business capital to purchase food and skipping meals.



Table9: Average Regional Household Frequency, Severity Ranking and Average Scores in Kano, Nigeria

Description	R	KN		KM		KS	
		AD	S	AD	S	AD	S
Borrowing/Purchasing Food on Loan/Credit	1	3	3	3	3	4	4
Selling Assets/livestock/Using Business Capital	4	4	16	4	16	4	16
Reduction in Food Consumption	3	4	12	3	9	4	12
Depending on Government Palliatives/Assistance	2	4	8	3	6	4	8
Eating Less Preferred Food	1	3	3	3	3	3	3
Skipping Meals	4	4	16	4	16	4	16
Children Eating First	1	3	3	3	3	4	4
Average Scores (Average CSI)			61		56		62

Note: KN= Kano North; KM= Kano Metropolitan; Kano South; R=Ranking; AD= Average Days; and S= Severity

Source: Survey, 2020

5. Conclusions and Recommendations

The study examined the impact of COVID-19 against household food security and coping strategies adopted during the lockdown period in Kano State, especially the government palliatives. Findings from the study reveal that majority or about 54 per cent of households in Kano are food insecure. This is relatively different from the previous results of food security status in Kano, an indication that COVID-19 has a severe impact on the food security status of households in Kano. In-context CSI also shows an increase average index in Kano as against the previous studies. The results from FSI and CSI all indicate that Kano south has the highest food insecure households and in dire need of assistance in terms of government palliative.

Findings from the socio-economic description of the households reveal that 85 per cent and 89 per cent are male and married households, respectively. The average age among the households is 41 years, while the average household size is estimated to be ten (10) individuals per household. Finding also shows that the impact of COVID-19 has started manifesting on the private sector employment; it also affects both the monthly expenditure and income of the households in the study area. About 60 per cent of the households are farming households. However, evidence has shown some form of diversification among the households, agricultural outputs for the current farming activities will also be impacted by the COVID-19 especially if the existing measure of lockdown continues. There are also the challenges of few workers in the farm, lack of market for raw materials to be used in the farmers.

This study, therefore, recommends the following for the policymakers in Kano. Firstly, it's imperative to accept the new fact concerning the new norm in terms of living with COVID-19. The government needs to come up with smart measures in fighting the virus. Total lockdown in Kano will only deteriorate the level of food security status among household heads; especially those involved in private businesses who need to go out before putting



food on the table and farming households that need to go to farms for planting and other agricultural activities.

Lockdown, especially to the farmers in Kano, will seriously affect the outcome of the present agricultural activities for the year, which will subsequently affect the food security status of households and the State in general. Kano is identified as the food basket of the Nation. The government should either come up with some specific days that will allow the farmers to go to farms and enable other services that have a direct link with farming activities to operate under strict compliance with social distances and use of face mask. In so doing that, agricultural activities will not be affected, which will also allow household heads to have available food for households. There is also the need for the government to encourage the production of food crops against cash crops among farming households.

The effort put in place by the government and wealthy private individuals in the State is considered minimal. While the government always insist on lack of funds due to low revenues and grants from the Federal Government, much is expected on the part of the State government. The contributions obtained from the private business individuals in the State are also meagre considering the number of vulnerable individuals in the State, especially in Kano south. Therefore, there is the need for more wealthy individuals to step up and contribute more during this pandemic.

Government needs to put in place measures that can keep track of the palliative and contributions sourced for the most vulnerable in Kano for accountability, especially as evidence has shown that the materials and food items in most cases ended up in the hand of the politicians and their party members. Therefore, the government needs to completely take the issue of corruption in the system with all the seriousness it deserves.

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