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How Food Secure are Households in Kano North in Pre-COVID-19 and during Covid-19 Lockdown

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Abstract
COVID-19 pandemic had negative impact on the activities of households in the entire globe, precisely food security status. The study aims to find how food secure households in Kano north are during COVID-19 lockdown pandemic as against the pre-COVID-19 period. The study uses primary data to draw a sample size of 160 household head respondents, almost the same size of respondents used in pre-COVID-19. The study used descriptive analysis and food security index to determine the level of food security status. Findings from the index reveal that pre-COVID-19 index was 0.7. At the same time, during the lockdown, the situation deteriorates to 0.6, suggesting that the impact of COVID-19 has significantly affected the food security status of the household in Kano north. Also, pre-COVID-19 revealed that per capita calorie requirement was 1,881 kcal against the 1,558 kcal during the COVID-19 pandemic. At the same time, about 52% of the households were food secured at pre-COVID-19 pandemic as against the 32% during the COVID-19 pandemic. The study recommends that government need to introduce measures or investment that are pro-poor to improve the food security status of households. The study, furthermore, recommend that less severe measures of total lockdown need to be put in place to allow farmers to go to farms while following all the measures of social and physical distance and putting face mask.

Keywords: COVID-19, lockdown, pandemic, calorie, index, kcal
JEL Classification: Q18, Q54

1. Introduction

The world is not recovery, still in it from the divesting impacts of COVID-19 that is affecting every aspect of our daily life. One of such is the issue of food security challenges among the households in the world. According to the International Food Policy Research Institute (IFPRI) report, close to 690 million individuals were faced with the problem of food security in 2019, which represent an extra 10 million individuals over the 2018 projected figure. This discovery has cast serious doubt as to whether the goal of achieving or eradicating hunger by 2030 is going to be achievable, especially with current COVID-19 pandemic that the world is witnessing (Nguyen, 2020). According to Food and Agricultural Organization (FAO), an estimated 841.4 million people globally are projected to be hungry by

the end of 2020 if the current situation persists, as such the possibility of meeting up with zero hunger in the world by 2025-2030 will be highly doubtful as illustrated in Table 1 (FAO, International Fund for Agricultural Development [IFAD], United Nations Children's Fund [UNICEF], World Food Programme/World Health Organization [WFP/WHO], 2020).

Furthermore, according to FAO *et al.* (2020) the number of Prevalence of Undernourishment (POU) globally has witnessed an unprecedented growth from 2018-2019. The number of POU in Africa is estimated to be more than 250 million in 2019, an increase of 17.6% from 2014. Chunk numbers of the undernourished individuals are located in Sub Saharan Africa (SSA) with about 32 million additional hungry people from 2015 (FAO et al., 2020). Identifiable causes of such increase are the economic slowdown and downturn witnessed in numerous parts of the region within the period, especially in the last 2-3 years. The PoU projection of 2030 in Africa from Table 1 reveals that about 433 million individuals will be hungry, with the majority or about 412 million coming from SSA (FAO et al., 2020).

More than half of the total numbers of hungry people in the world are in Asia, where an estimated 381 million people were undernourished in 2019. However, due to improvement and available data from the Republic of China, there will be a slight reduction in the number of undernourished individuals in Asia by 2030 to about 329 million or 6.6% of the total population in the region (FAO et al., 2020). Table 1 reveals that both Latin America and the Caribbean and Oceania both witnessed an increase in the number of undernourished people in 2019 from 2018 of 48 million and 2.4 million respectively. While 2030 projection reveal that the number will still increase to about 67 million for Latin America and the Caribbean, while Oceania is projected to be around 3.4 million people (FAO et al., 2020; FAO, 2020).

Table 1: Prevalence of Undernourishment in the World

	2018		2019		2030	
	Per cent	Figure	Per cent	Figure	Per cent	Figure
World	8.9	678	8.9	688	9.8	841
Africa	18.6	237	19.1	250	25.7	433
North Africa	6.3	15	6.5	16	7.4	21
Sub-Saharan Africa	21.4	222	22	235	29.4	412
Eastern Africa	26.7	113	27.2	118	33.6	192
Middle Africa	29	49	29.8	52	38	91
Southern Africa	7.9	5	8.4	6	14.6	11
West Africa	14.3	55	15.2	59	23	119
Asia	8.4	385	8.3	381	6.6	329
Latin America/Caribbean	7.3	47	7.4	48	9.5	67
Oceanic	5.7	2.4	5.8	2.4	7	3.4

Source: FAO et al., 2020

FAO et al. (2020) identified numerous causes that pose threats to food security progress in the world. For instance, in 2017 and 2018, the organization attributed conflicts and climate changes as the leading causes of food security challenges.

However, in 2019 the threat to food security can be traced to the effort of economic slowdown and economic downturn. But in 2020 COVID-19 and severe outbreak in locust, especially in Eastern Africa pose a severe challenge to hunger, food insecurity and malnutrition among households in the world. Unless the matter is given adequate and immediate attention, the havoc that the pandemic will cause is better imagined (FAO et al., 2020).

Nguyen (2020) estimated that about 83 million-132 million additional people would be push to serious food security challenges or chronic hunger in 2020 due to COVID-19 pandemic. The pandemic can also affect the nutritional status of millions of vulnerable populations and at the same time deteriorate the health as well as the socio-economic conditions of the entire world (FAO et al., 2020).

According to Schmidhuber *et al.* (2020); Torero (2020) and Savastona (2020) identified various ways through which pandemic can affect food security and food systems namely shocks in both the demand and supply of food systems throughout the globe. In the supply side, food shortage might not necessary be caused by COVID-19 pandemic, since the assumption is that the production of various stable foodstuff (wheat, rice, maize and soybean) will be static and above the average production in 2020 (Agricultural Market Information System [AMIS], 2020). However, the pandemic has disrupted food supply chains throughout the globe. For instance, labour mobility in locations dependent on seasonal farming has been limited by the COVID-19 containment measures put in place by the various governments to control the spread of the pandemic in the world. Also access to markets and transportation of foodstuffs locally and across regions/countries has been affected by the lockdown measures. At the same time, logistics for the new farming seasons has also been affected by the COVID-19 pandemic (Schmidhuber, Pound & Qiao, 2020).

Massive containment measures especially the lockdown measure across the world, affected households' capacities to access food, subsequently affecting the demand side as well as the economic downturn. In this regard, both poor and the vulnerable find it difficult for food. Both the low- and middle-income nations of the world are likely the most impacted because they have or lack shock or contingency measures and available funds to stimulate their economies during the pandemic. Therefore, any form of pandemic-induced global economic crisis will subsequently create a set of food insecurity challenges, even when the countries affected require no form of interventions before the pandemic (Schmidhuber *et al*., 2020).

According to International Monetary Fund (IMF) Nigeria will witness a shrivelling growth by 5.4% in 2020, while the global growth rate is projected to be -4.9% in 2020. The report suggested that all regions of the world will witness a negative growth rate for the first time in 2020 (IMF, 2020). COVID-19 and the drop in crude oil prices will plunge the Nigerian economic into serious recession, just as National Bureau of Statistics (NBS) estimated an average recession measuring at about -4.4% in 2020 in the best case scenario, while the worst case estimated the growth to be around -8.9%. Where the country stimulates the economy, the growth is expected to be around -0.59%, in all the scenario the expectation is that poverty

among the people in the country will be triggered by the negative economic growth {NBS, 2020).

According to World Bank projection as the Nigerian economic contracts, the per capita income will as well fall due to the falling crude oil price and the COVID-19 pandemic thereby pushing additional 5 million people into poverty relative to pre-COVID-19 forecast (World Bank, 2020). The 2019 projection estimated that Nigeria has about 85 million people or 40.2% of the total population living below the poverty line, which translates into four people out of every ten people in the country. Million more are living just above the poverty line, and the pandemic tends to move those vulnerable into poverty, which is estimated at 4.9 million. More than 75% of the poors in Nigerian are residing in the Northern part of the country, most of which are predominantly traditional farmers (World Bank, 2020).

The impact of COVID-19 pandemic to Nigerian households is the inability of the households to generate income to meet up with basic needs in consumption. An estimated 1/3 of households in the country are predicted to be in an urban area are solely dependent on income generated from service as against agricultural sector mostly from the rural location. The pandemic has resulted in reducing 1 in 2 households overall food consumption, thereby affecting the food security status of the affected households in the country (NBS, 2020).

COVID-19 pandemic has presently affected both the food systems and the poverty level in the world in general and specifically in Nigeria. According to Zurayk (2020), the pandemic has presently affected all the four fundamental dimensions of food security negatively, namely accessibility, availability, utilization and stability. NBS (2020) stated that more than 83 million people in Nigeria are lower by National standard, while over 40% of the total population had real per capital expenditure less than N137,000 per year, while monthly income is less than N11,500 and daily income per day estimated at N38. Poverty headcount among the rural populace is estimated at more than 52% while that of urban is 18%. Kano has a poverty headcount of 55% above the national average (NBS, 2020).

COVID-19 pandemic even though is a lethal virus that has affected almost all human endeavour, including food security status, yet its empirical impact is still little as more and more researchers are now focusing on its impacts. Presently few studies concentrate on the impacts of COVID-19 and food security status in the world. Therefore, this study aims at accessing the impact of COVID-19 and food security status among households in Kano north.

2. Literature Review

Deaton and Deaton (2020) empirically studied food security and Canadian agricultural systems threat by COVID-19 using the Canadian Community Health Survey (CCHS). The study discovers that even with the improvement in demand and supply chain coupled with the distribution chain. The result shows insignificant appreciation in the price of food, indicating low food supply in the future. In contrast, both intermediate and long term show a significant uncertainty due to the loss of life and sickness due to the world's COVID-19 pandemic.

Amare, Abay, Tiberti, and Chamberlin (2020), using spatial variation analysis, investigated the effect of COVID-19 on food security using panel data evidence from Nigeria. Findings reveal that households with higher cases of COVID-19 or agility lockdowns witnessed significant upward growth in food security challenges. Furthermore, finding reveal that labour market participation significantly reduces and food prices significantly increase due to the COVID-19 pandemic. The result also indicates a variation in the COVID-19 effect on economic activities and households. Households' experience of food security challenges increased with the introduction of lockdown measures by 12; while the tendency of taking part in non-business activities reduced by 13%. The impact of lockdown measures is smaller on wage-related farming activities. The finding also discovers that households depending on non-farm businesses, are poorer and more vulnerable households with school-aged children, and households residing in remote and conflict-affected areas witnessed a deteriorating food security challenge.

Dev and Kabir (2020) investigated COVID-19 and food security in Bangladesh, reflecting on what is done and what can be done. The study reveals that travel restrictions, lockdowns, and social distancing put in place for an extended time in Bangladesh take back food security achievement witnessed in the previous years. Finding furthermore reveals that while people considered food security achievement as a critical task, on the other hand, the COVID-19 pandemic is considered as a less critical challenge in Bangladesh.

Ahn and Norwood (2020) measure food insecurity during the COVID-19 pandemic of spring 2020 in the United States of America (USA). The result reveals that while there is little or no evidence of an increase in food insecurity level among the households, the percentage of households with children categorized as food insecure increased by about three percentage points more than that of the 2016 and 2017 investigation.

3. Methodology

The study area is Kano State under the north senatorial district, which comprises about 14 Local Government Areas (LGAs) it is considered to be the most populous State in Nigeria. The study used primary data and adopted a random probability sample technique through a well-structured questionnaire among the 160 households. The sampling process first selected 4 LGAs from Kano north at random, comprising Dawakin Tofa, Gwarzo, Karaye, and Kunchi. Each of the LGA, four wards were selected randomly, and each ward produced a total of 10 households each. One of the eligibilities for participation is that the respondent must be the head of a regular household. In analysing the data, the study exploited the Food Security Index (FSI) and descriptive analysis.

FSI compares the household's calorie consumption measured against the recommended daily calorie requirement set by the FAO. To satisfy the index, two conditions need to be satisfied, namely the identification and aggregation. Aggregating involves aggregating the household calorie consumption into per capita calorie consumption for the entire members of each household and comparing it with the recommended energy requirement. On the other hand,

identification involves identifying and demarcating household members into infants, children, and adults to assign factor equivalent. Each of these groups of individuals has different consumption patterns. This demarcation will provide the adjusted household adult equivalent (Mukhtar, Kamaruddin & Applanaidu, 2018a). The conversion or adult equivalent for adjusted household use for this analysis is presented in Table 2.

Table 2: Recommended Daily Energy Intakes and Equivalent Scale

Age category (yrs)	Average energy per day	Factor equivalent
Children less than 6 yrs	813	0.3
Children (6 – 18) yrs	1,897	0.7
Adults (> 18) yrs	2,710	1.0

Source: Mukhtar et al., (2018a).

FAO (2016) recommended an average daily calorie requirement for a healthy Nigerian to be around 2,710 kcal per day. The figure of 2,710 kcal is enough for a normal human being to enable him to work and source income or generates income to feed his country's household. The country also has different foodstuff that has different calories. A table of such commonly eaten food in the country is used for easy analysis, as suggested by Oguntona and Akinyele (1995). Therefore, the FSI is given as follows.

$$\beta = \frac{\chi_\tau}{\alpha} \quad \ldots 1$$

β represent food security index or household food status, which can either be food secure if the outcome is equal to 1 or more. While outcome less than one is defined as food insecure household, χ *is* the per capita calorie or sometimes refers to the energy consumption of t household and the per capita recommended energy requirement set by FAO in a household, 2,710 kcal.

Surplus/shortfall ratio (p) above or below from the threshold, which is defined by FSI as one (1) express in term of percentage (surplus index) or below the threshold (shortfall index), given as follows.

$$(\mu) = \frac{1}{\Omega} = \prod_{i=1}^{m} \rfloor \quad \ldots 2$$

$$\rfloor = \frac{\varepsilon-\mu}{\mu} \quad \ldots 3$$

Further substituting into Equation (2) will give Equation (4) below

$$(\mu) = \frac{1}{\theta} = \prod_{i=1}^{m} \frac{\varepsilon-\mu}{\mu} \quad \ldots 4$$

μ indicate the total number of households classified as food secure or food insecure, represent per capita calorie surplus or deficiency.

Various studies used FSI in determining the food security status of a household including the work of Mukhtar et al. (2018b); Mukhtar (2019a) Mukhtar (2019b) and Mukhtar (2020c).

4. Results

Descriptive analysis from Table 3 reveals that out of 160 household heads, 93% of the household heads are male, while only 7% are female-headed households. The implication of a higher male-headed household is that the study area will be food secure as male household heads are more responsible in meeting up with the responsibility of providing food to the rest of the household members.

Table 3: Socio-demographic Characteristics of Household Heads

Details	Percentage	Average	Amount
Gender Status			
Male	93		
Female	7		
Age		40	
Classification of Age			
20-30	21		
31-40	26		
41-50	33		
50-above	20		
Non-school Children	49		
School Children	51		
Children Under 18 Years	56		
Adult Above 18 Years	44		
Marital Status			
Married	91		
Divorced	2		
Widowed	8		
Household Size Classification		10	
1-5 Individuals	24		
6-10 Individuals	35		
11-15 Individual	26		
16-20 Individuals	9		
21-above Individuals	6		

Source: Field Survey, 2020.

The average age among the household head is estimated at 40 years old; empirically, this is also another good sign that most household heads are within their productive age. More effort will be put into farming activities to improve food security status. Furthermore, classification in terms of age reveals that about 21% and 26% are with the age bracket of 20-30 years and 31-40 years, respectively. At the same time, about 33% and 20% of the household heads are within the age bracket of 41-50 years and 51-above. Marital status among the respondent's household heads from Table 3 reveals that the majority of about 90% are married, while 2% and 8% are divorced and widowed, respectively. There is a high number of married household heads in the study area. This is also another indication that

the area tends towards being food secure since one of the obligations of a married household head is to put food on the household's table daily. Household size, on the other hand, can affect the food security status of a household. The expectation is that a high number of household can significantly affect the food security status, especially the household embers are unproductive than a household with fewer household size and productive members. Table 3 reveals that the study area's average household size is estimated to be ten individuals per household. Household size classification from Table 3 reveals that about 24% and 35% are within the family size bracket of 1-5 individuals and 6-10 individuals, respectively. At the same time, about 26%, 9%, and 6% are within the family size classification of 10-15 individuals, 16-20 individuals, and 21-above individuals. Furthermore, Table 3 reveals that 56% of the family size are school children, while 44% are above 18. About 51% of the family size are non-school children and classified as an unproductive element of the family size.

Household classification from Table 4 reveals that 59% are farming households, while about 41% of the household heads are non-farming households in the study area.

Table 4: Socio-economic Characteristics of Household Heads

Details	Percentage	Average (#)
Household Classification		
Farming	59	
Non-Farming	41	
Educational Qualification		
Non-formal	20	
Primary School Certificate	42	
Secondary School Certificate	32	
Higher Education Certificate	6	
Occupation		
Private	25	
Public	35	
Farming	40	
Income and Expenditure		
Average Monthly Expenditure		112,830
Average Daily Expenditure		3,760
Average Monthly Income		113,500
Average Daily Income		3,783

Source: Field Survey, 2020.

Table 4 reveals that the educational qualification among the household heads is non-formal and primary education. About 20% of the household heads have non-formal education, and that majority or about 42% have first leaving school certificate, which is primary education. About 32% have a secondary school certificate, while only 6% have a higher education certificate, mostly at Diploma level and Bsc. The implication here is that most household heads have a low level of education which can have negative impact on their ability to generate more income, capacity job opportunities, and technological innovations in the farming

sector. This can easily result in a reduction of household heads' ability to be food secure. In terms of occupational jobs, Table 4 reveals that about 25% are into private business while about 35% and 40% are into public sector and core farming activities, respectively. Average monthly expenditure for the households in the study area is estimated to be around N112,831, with over 90% of the amount going for food expenditure and only 10% for non-food expenditure. This presents a negative signal since most of the expenditures will be consumed, and investment is seriously dropping below expected, with lack of savings by the study area's household heads. A further breakdown from Table 4 reveals that the household's average daily expenditure is estimated at N3,760. Table 4 further reveals that the household heads' average income is N113,500, while the daily average income is estimated to be around N3,783 among the household heads.

Table 5 reveals the pre-COVID-19 food security index from Kano north. The table shows that an estimated 52% of the households were food secure, but 48% were food insecure. The food security index in Kano north before COVID-19 was 0.7 indicating a severe food insecurity status overall in the study area; Total Calorie consumption among households was 2,056,219kcal, while the total calorie requirement was 3,147,460kcal. Per capita calorie consumption and requirement were 1,881.5kcal and 2,711kcal, respectively, in Kano north. Total adult equivalent in the study area was 1,161 from total households of 165. This outcome revealed a food security index of 0.7, which is below the threshold of 1. The outcome revealed that even though the study area has a high percentage of its households classified as food secured, which was estimated at 52%. The number of households classified as food insecure had a colossal calorie requirement due mainly to household sizes no need.

In contrast, Table 6 shows a food security index of the same location from the same local government, just as in Table 5. However, analyses were carried immediately after the lockdown suspension to ascertain whether households are food secure or not due to the COVID-19 pandemic. Table 6 reveals that about 62% of the households were food insecure due to COVID-19 as against the 48% pre-COVID-19 pandemic. Therefore, an additional 14% of households were pushed into food insecurity status during the pandemic. This is in line with FAO's findings (2020), which stated that over 7 million individuals were pushed into severe food insecurity status due to the COVID-19 pandemic. The table furthermore reveals that total households' calorie consumption in the study area is 1,832,200 kcal clearly less than 2,056,200 kcal, which means there is also a reduction of calorie consumption among the households in the study area, and one of the reasons for such is the reduction in income generation capacity of the household heads especially when the lockdown measures was put in place by the government. Also, it was observed that some household heads also lost their job especially those employed by the private sector in the study area, while all the household heads recorded a reduction in income during the lockdown period. Total households' calorie requirement slightly increased from the pre-COVID-19 figure of 3,147,460 kcal mostly because there is an increase in the adult equivalent during COVID-19 pandemic as against the pre-COVID-19. It also means that some of the children that were considered

underage have grown from the previous study and are now adults who take full-calorie requirement of 2,710 kcal as suggested by FAO.

Table 5: Food Security Index among Households in Kano North Pre-COVID-19

Percentage of Food secure Households	52
Percentage of Food Insecure Households	48
Total Calorie Consumption	2,056,219.00
Total Calorie Requirement	3,147,460.00
Per capita Calorie Consumption	1,881.50
Per capital Calorie Requirement	2,711.00
Total Adult Equivalent	1,161.00
Food Security Index	0.70
Short fall Index	0.33

Source: Mukhtar et al., (2018a)

Table 6 further reveals that the food security index during COVID-19 is estimated at 0.60, deterioration from the pre-COVID-19 index of 0.7. This suggests a much-worsening food security status among the households in the study area. Per capita energy consumed or calorie consumption is 1,558 kcal, clearly, below the per capita energy or calorie requirement of 2,710kcal and a low figure compared to pre-COVID-19 per capita energy consumed 1,881.50kcal. The total adult equivalent in the study area during the lockdown is 1,176 against the pre-COVID-19 of 1,161. The family size will most likely increase in the next few months, which will also spell trouble in terms of food security status as most household heads reveal the possibility of an unplanned pregnancy.

Table 6: Food Security Index among Households in Kano North During COVID-19

Percentage of Food secure Households	32
Percentage of Food Insecure Households	62
Total Calorie Consumption	1,832,219
Total Calorie Requirement	3,247,460
Per capita Calorie Consumption	1,558
Per capital Calorie Requirement	2,761
Total Adult Equivalent	1,176
Food Security Index	0.60
Short fall Index	0.40

Source: Fields Survey, 2020

Further disaggregation of food security status into income classification, educational qualification, and family size as revealed in Table 7 suggests that in terms of household income classification, about 20% of the food secured households are within the income classification of N10,000-N100,000. In comparison, the majority or about 70% of these under the income level are classified as food insecure. This shows the significant impact lost of money has on food security especially during the lockdown period. Similar findings also show how income and conflict can easily trigger food insecurity among households in Kano (Mukhtar 2019d; Mukhtar 2020a; Mukhtar 2020b). For households under the income classification of N101,000 - 200,000, about 41% are classified as food

secure, while only 29% are food insecure. In the same vein, about 39% of the food secure households are food secures, and only one percent are food insecure. This is an indication that the higher the household income, the higher its food security status. In terms of educational qualification, Table 6 reveals that the majority or about 65% of the households classified as food insecure have low educational qualifications ranging from informal to primary school certificate.

In comparison, about 35% and 47% of the households have middle and high educational qualifications. The implication here is that with higher educational qualifications, food security status is expected to increase. Furthermore, Table 7 reveals that about 48% of the food secure households have a family size of 1-10 individuals; about 22% of the food secure households have a family size of 11-20 individuals. In comparison, about 30% have a family size of 21-above as food secure.

Table 7: Disaggregation in Households' Income, Education and Family Size into FSI

Descriptions	Food Secure	Food Insecure
Income Level		
N10,000-N100,000	20	70
N101,000-N200,000	41	29
N201,000-above	39	1
Educational Qualification		
Low Education	18	65
Middle Education	35	25
Higher Education	47	10
Family Size		
1-10 Individuals	48	25
11-20 Individuals	22	38
20-above Individuals	30	37

Source: Fields Survey, 2020.

5. Conclusions and Recommendation

The study compares the food security status among households in Kano north pre-COVID-19 and during lockdown measures during the onset of COVID-19. Descriptive analysis reveals that there are 160 household heads respondent that participated in the survey, almost the same number with the previous survey conducted in 2018 before the COVID-19 pandemic. About 93% and 91% of the respondents are male and married respectively; about 62% have a low educational background ranging from non-formal education and primary school certificate. In comparison, about 59% of the households are farming households in the location. The average age among the household heads is estimated around 40 years which indicate an active and productive household head and average family size is estimated to be around ten individuals per household, with at least six children under the age of 18 years and four adults. In terms of monthly expenditure, average monthly expenditure among the households is estimated at N112,830, while monthly income generation among the households is estimated at N113,500. The

pandemic has resulted in forcing the households to rely on the little saving, thereby affecting the investment in the study area.

Statistical evidence reveals that households' food security status has deteriorated immediately after the onset of the pandemic with many more households reducing or cutting back with their food intake as a means of coping with a pandemic that comes along with so many economic consequences. Other economic variables also combine with the pandemic to influence the food security status. The result from the FSI reveals an index less than the threshold of 1, indicating that even before the pandemic; the study area is facing severe food security challenges. The result indicates that in 2018 the FSI is 0.7 while the new FSI is 0.60 suggesting a deteriorating food security status. The pre-COVID-19 result shows that about 52% of the households were food secured, while result from the analysis from the COVID-19 shows that only 32% of the households are food secure. The result, therefore, indicates a severe problem with food security status in the study area. Total calorie consumption pre-COVID-19 was 2,056,219 kcal revealing a severe reduction during the COVID-19 of 1,832,200 kcal. There is little or no significant difference in calorie requirement between pre-COVID-19 and during COVID-19 since it is fixed. The analysis shows a significant difference between per capita calorie consumption in the two-period with pre-COVID-19 higher than that of COVID-19.

Clearly, the result shows that food security is a severe challenge in the study area, the government is therefore strongly advised to invest in a project that is pro-poor project like agriculture will go a long way since majority of the households are engaged in agricultural activities. The study also observed that the impact of the government palliative had not touched the grass-root with many poor households left without any significant assistance to alleviate the suffering during the lockdown measures. Lockdown measures need to be softened to the farmers instead of stopping them from going to the farm. The government should encourage putting of face masks and maintaining a social and physical distance during and after farming activities.

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