Food Price Changes and Consumption Adaptation Models in Enugu State, Nigeria Amidst Covid-19 Pandemic Shocks

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Abstract

The Covid-19 pandemic was a global disaster that affected the food security status of the world. This article examined food price changes and consumption adaptation models in Enugu State, Nigeria, to ascertain people's consumption patterns and the usefulness of palliative measures given to them. Primary data was generated through a survey of eighty respondents. The secondary data was compiled from monthly reports of food prices by the National Bureau of Statistics and was analysed using descriptive statistics, the Consumer Price Index and chi-square tests. The price indices of food items like white garri and sweet potatoes showed very high inflation during the pandemic period. The number of households who ate only once a day increased, and those who ate three times a day decreased. The chi-square result on differences in eating habits and meal regimen before and during Covid-19 is significant. Many of the respondents received palliative aid during the pandemic. The article recommends that the government should encourage farmers to increase their production by providing them with loans and subsidies so that they may produce enough food in times of emergency like the pandemic.

Keywords: food prices; Covid-19; households; consumption; palliative aid; Nigeria

Résumé

La pandémie de Covid-19 a été une catastrophe mondiale qui a affecté la situation de sécurité alimentaire dans le monde. Afin de déterminer les modes de consommation des populations et l'utilité des mesures palliatives qui leur

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sont proposées, cet article examine l'évolution des prix de denrées alimentaires et les modèles d'adaptation de la consommation dans l'État d'Enugu, au Nigeria. Les données primaires ont été générées grâce à une enquête menée auprès de quatre-vingts répondants. Les données secondaires ont été compilées à partir de rapports mensuels sur les prix de denrées alimentaires produites par le Bureau national des statistiques. Elles ont été analysées à l'aide de statistiques descriptives, de l'indice des prix à la consommation et de tests de chi carré. Les indices de prix de produits alimentaires comme le garri blanc et les patates douces ont révélé une très forte inflation pendant la période pandémique. Le nombre de ménages qui s'alimentaient une fois par jour a augmenté tandis que celui de ceux qui mangeaient trois fois par jour a baissé. Le résultat des tests de chi carré sur les différences dans les habitudes alimentaires et le régime alimentaire avant et pendant le Covid-19 est significatif. De nombreuses personnes interrogées ont reçu une aide palliative pendant la pandémie. L'article recommande que le gouvernement encourage les agriculteurs à accroître leur production en leur accordant des prêts et des subventions qui leur permettent de produire suffisamment de nourriture pour les cas d'urgence, comme la pandémie.

Mots-clés : prix des denrées alimentaires ; COVID-19 ; ménages ; consommation ; aide palliative ; Nigeria

Introduction

Health, economics and finance tend to drive human sociocultural affairs. People's health outcomes are often a function of dietary intake, physical and social environments and access to medical facilities (Pitt and Rosenzweig 1986; McNamara, Ulimwengu and Leonard 2010). Thus, the agriculture–food–health nexus contribution to human development cannot be overemphasised. The economic effect of the Covid-19 pandemic and lockdown on access to and demand for food led to changes in food prices (Iheme 2022), which skyrocketed around the globe (Vos *et al.* 2022). The spike in food prices in 2021 was largely attributable to the recovery in food demand from the world Covid-19 recession and temporary disruptions in logistics rather than severe food supply disruptions or trade restrictions (Vos *et al.* 2022).

Food prices and consumption models are the major factors that determine how diets affect human health. A balanced diet and good consumption models depend, among other things, on food prices and household income (Mkpado 2012a). Stabilising food prices has always been a major issue in agricultural development and is achieved through enhanced productivity and distribution channels. It is no wonder then

that responsible governments aim at improving the incomes of the people, increasing agricultural productivity and maintaining other policies that will result in good or affordable food prices. These objectives can be reached using sound food security programmes in a framework of good or responsible governance. However, economic meltdown, financial crises and pandemics often shake the food security status of world economies, which could be stabilised by improved agricultural capacity-building (Mkpado 2013a). One of those formidable global shocks that shook the world's economic, political, financial, food security and health status was the recent Covid-19 pandemic.

The Government of Nigeria, like governments across the world, enforced border closures, lockdowns and social distancing to curb the pandemic (OECD 2020). The result was a hike in the cost of transportation with a corresponding increase in the cost of many commodities in the market. The measures affected human relations and physical contact for business purposes. They paved the way for online and digital business transactions and the dissemination of information. Speculative purchases and panic-buying of essential food items prompted a large increase in demand, resulting in shortages and a spike in the prices of commodities at the expense of non-essential food items (Bairagi, Mishra and Mottaleb 2022). Producers and retailers were unprepared for the sudden increase in demand for foodstuffs at the onset of the pandemic and the resultant rise in food prices changed consumer patterns across the world (Stoevska 2020).

Attanasio *et al.* (2013) argue that consumers change their consumption and spending to mitigate the impact on their welfare. With the purchasing power of consumers affected, there was a fall in household consumption. The consumption expenditure pattern of Nigeria in 2019 shows that 56.65 per cent of total household expenditure (about NGN 40.2 trillion) was spent on food and the remaining 43.35 per cent on non-food items (NBS 2019). With food taking up more than half of the household budget, rising costs were likely to mean making some hard choices.

Rising food prices can affect the health of poor households negatively by making it more difficult for them to afford basic food requirements (Mkhawani *et al.* 2016). The livelihoods and choice of diet of farmers, traders, producers and consumers are affected by food prices (FSP 2012). Market prices of commodities are influenced by the devaluation of the local currency through food importation, a drop in the price of crude oil, infrastructural bureaucracy (increasing the cost of production of goods), communal conflicts and clashes between crop farmers and herders leading to less food being produced, shocks such as poor harvests and adverse

weather conditions, supply shocks and pandemics such as Covid-19, which ravaged the entire globe. The food security of the poor can be threatened by the slightest change in food prices because they spend a greater portion of their income on food (Zezza *et al.* 2008; FSP 2012). The rich can easily adapt to these changes because of their higher income.

The world has experienced many crises in the past – the Great Depression of the 1930s, the financial/economic crisis of 2007/2008, and now Covid-19, which caused not just a health crisis but also financial and economic crises as well as social and developmental problems. This study is based on neoclassical theory which states that people react and take actions based on the information they have. The hike in food prices resulting from the Covid-19 pandemic and its associated lockdown made consumers seek coping strategies to feed their households; thus they adapted their food consumption patterns and adjusted their meal intake.

High food prices can affect developing countries directly or indirectly (Holmes, Jones and Wiggins 2008). They do so directly when the international price of food is higher than domestic prices, which occurs when a rise in the currency exchange rate is passed on to domestic prices and makes food less affordable. However, this can encourage local production (Mkpado, Arene and Chidebelu 2012). The indirect effect is felt when international prices are higher, resulting in trade deficits, which may lead to less government revenue with a corresponding reduction in government expenditure and an increase in the unemployment rate.

Food price increases were identified in a number of countries in Africa and Asia from February to May 2020 – a period associated with the rapid spread of Covid-19 (GAIN 2020; FAO Datalab 2020). The increase was highest in very poor African countries like Rwanda (19.5 per cent), followed by Tanzania (12.3 per cent) and Mozambique (10.5 per cent). Kenya (4.21 per cent), Ethiopia (3.44 per cent) and Nigeria (3.10 per cent) were the least affected among selected African countries but the impact on them was comparable to Asian countries like India (3.82 per cent) and Pakistan (2.55 per cent), Indonesia (3.82 per cent), and Bangladesh (0.95 per cent).

The literature on Covid-19 varies in focus, on livelihood or welfare. Covid-19 affected people's livelihood, which adversely affected their welfare. These effects on people's welfare can be measured easily by considering their consumption patterns and associated changes, which reveals the susceptibility of people to economic, social and nutritional challenges. This article, therefore, examined food price changes between March and June 2020 for major food staples like rice, beans, yams, meat, fish and milk, as well as products for baking, such as sugar and flour. It also analysed people's

consumption patterns with respect to food and non-food items. The results indicate what people will give up to obtain necessary food items. Analyses of consumption shocks and associated adaptation models are very important in understanding and managing poverty crises.

Mkpado (2012b) noted that during global financial and food crises, household food consumption is adversely affected. People minimise phone calls and clothing purchases to cushion diets that were mostly unbalanced. This was partly due to the very high cost of food items. So this article set out to find answers to questions such as: Did the Covid-19 pandemic shocks affect people the same way? How severely? Did people sell productive assets to feed their family? What was the percentage increase in the price of food staples? What food substitutions did people make between protein and carbohydrate sources? Consumers might include more neglected and underutilised crop species (NUCS) as the price of major foodstuffs increases, so did the NUCS gain more acceptance due to their lower price as consumption and spending patterns were altered to maintain a balanced diet (Attanasio *et al.* 2013; GAIN 2020)? How do people make purchases at minimum cost? Aron (2018) showed that Africa has the lowest number of people using mobile money. Did the period of lockdown compel people to use e-transaction models more?

In light of the above, the objectives of the study were to examine:

1. Food price changes during the Covid-19 pandemic shocks
2. Consumption patterns and adaptations
3. The usefulness of palliative measures offered by government and non-government organisations.

The article's results provide information on what is needed to sustain populations in times of economic, social and health upheaval, and so contribute to emerging issues related to human sustainability amidst global challenges. The study is also very useful in understanding the constraints in achieving the SDGs – especially SDG goal 1, SDG goal 2 and SDG goal 12, among others. For instance, how do higher food prices increase food insecurity and what are the strategies to create a social safety net in the face of such an emergency? Policymakers, development partners and researchers will find useful information in this study on how to improve human welfare especially in the event of crisis or shocks. The findings could enable recommendations to be made to help ordinary citizens, governments and non-government organisations deal better with such challenges.

Methodology

The study area

The study was conducted in Nsukka Local Government Area (LGA), Enugu State, Nigeria. The state lies between latitudes 5º56′and 7º06′N and longitudes 6º53′ and 7º55′E (Ezike, 1998). Nsukka LGA is in one of the three zones that make up Enugu State. The LGA has a population of 309,633, comprising 149,241 males and 160,392 females (NBS 2006). The LGA is the home of the University of Nigeria, Nsukka, and therefore, is a hub of academic and commercial activities, which include farming and skilled craftsmanship/artisanship.

Data collection and sampling procedure

The study made use of primary and secondary data. Primary data was generated using a well-structured questionnaire given to a random selection of eighty respondents. The questionnaire dealt with consumption patterns, adaptation models and views on palliative measures. Secondary data was generated from monthly reports of food prices by the Nigerian Bureau of Statistics (NBS) E-library.

A multistage sampling technique was used. The first stage was the purposive selection of Nsukka LGA due to its proximity to the researchers, whose travel was restricted by the Covid-19 pandemic. The second stage was the random selection of eight communities in Nsukka LGA. The third stage was the random selection of ten respondents from each community, giving a total of eighty respondents.

Analytical framework

The data was analysed using descriptive statistics and chi-square tests. The Consumer Price Index (CPI) was also a factor. Descriptive statistics were used in examining almost all the objectives. The socioeconomic characteristics and other valuable information with respect to achieving the objectives were first presented using descriptive statistics, before applying chi-square tests. The Consumer Price Index was described to achieve objective 1 and was also presented in the manner of descriptive statistics. The CPI model is presented in equation 1.

$$\text{CPI} = \frac{\text{Price at Current Period (Month)}}{\text{Price at Base Period (Month)}}$$

The resulting figure can be multiplied by 100 to arrive at a percentage. If the value is less than unity (1) it means deflation but if greater than unity (1) it means inflation. Objectives 2 and 3 involved the use of a chi-square test. The test is implicitly presented as:

$$X^2 = \sum_{i=1}^{r} \sum_{j=1}^{c} \frac{(O_{i,j} - E_{i,j})^2}{E_{i,j}} \ldots\ldots 2$$

Where $(r-1)*(c-1)$ = a degree of freedom (df) at a 5 per cent probability level ($p< 0.05$); O = observed frequency; E = expected frequency; r = number of rows starting from i; c = number of columns starting from j; and where the X^2 (chi-square) calculated value greater than the tabulated value at the degree of freedom (df) is considered significant. The chi-square test was chosen for this analysis because the data for the X^2 test is either qualitative or one is qualitative and the other a scaled variable (quantitative). It was used to test consumption patterns before and after Covid-19 (objective 2) and to measure the usefulness of palliative aid irrespective of whether this was received or not (objective 3). It was also used to test the usage of e-transactions – that is, whether an ATM card was owned or not (another component of objective 2).

Results and Discussion

Socioeconomic characteristics of respondents that could affect consumption

Table 1 indicates the socioeconomic characteristics that could affect consumption. The first is age, which is a crucial factor to consider because age indicates decision-making. The article sampled the opinions of responsible individuals/adults whose minimum age was 20, the maximum was 70, and the mean was 51.78, with a standard deviation of 15.68. The result shows that adults are responsible for taking decisions on consumption patterns to adopt when there are changes in food prices – for instance, whether to consume more non-perishable staple foods, like yam, most of which lack micronutrients except if supplemented (GAIN 2020). Lyu et al. (2015) support this finding, demonstrating that these foods will negatively impact nutrition.

Gender is another critical factor in socioeconomic analysis. In the study there were forty-nine males (61.2 per cent) and thirty-one females (38.8 per cent), which indicates that both males and females are involved in household consumption adaptation to cushion the effect of food price changes.

Of the respondents, 50 per cent were married and living with their spouse, whereas 27 per cent were single and 15 per cent were widows or widowers. This finding shows that the burden of consumption expenditure resulting from food price increase, with particular reference to the Covid-19 pandemic, is borne by more married couples than singles. The good representation of males and females in the sampling indicates that both are involved in household consumption adaptation to cushion the effect of food price changes.

Most of the respondents had tertiary education (30 per cent) followed closely by those with primary education (28.8 per cent); only 21.3 per cent had secondary education. The smallest proportion of the respondents (20 per cent) had no formal educational qualification. The greater percentage of respondents possessing formal education could be due to the presence of the national premier university, which has made the town a hub for academic activities. It should be noted that tertiary education does not refer to degree certificates.

Table 1: Socioeconomic characteristics of respondents that could affect consumption

GENDER	AGE/ %						TOTAL
	18–20	21–30	31–40	41–50	51–60	61 and over	18–20
Males	2(4.1)	11(22.4)	6(12.2)	5(10.2)	11(22.4)	14(28.6)	49(100.0)
Females	0(.0)	3(9.7)	9(29.0)	4(12.9)	6(19.4)	9(29.0)	31(100.0)
Total	2(2.5)	14(17.5)	15(18.8)	9(11.3)	17(21.3)	23(28.8)	80(100.0)
Marital status							
	Single	Married	Divorced	Widow/ Widower	Separated	Transgender	Total
Males	17(34.7)	23(46.9)	4(8.2)	4(8.2)	1(2.0)	0(0)	49(100.0)
Females	5(16.1)	17(54.8)	1(3.2)	8(25.8)	0(0)	0(0)	31(100.0)
Total	22(27.5)	40(50.0)	5(6.3)	12(15.0)	1(1.3)	0(0)	80(100.0)
Educational qualification							
			No formal education	Primary education	Secondary education	Tertiary education	Total
Males			6(12.2)	18(36.7)	10(20.4)	15(30.6)	49 (100.0)
Females			10 (32.3)	5(16.1)	7(22.6)	9(29.0)	31 (100.0)
Total			16(20.0)	23(28.8)	17(21.3)	24(30.0)	80 (100.0)

	Primary occupation						
	Far-ming	Civil service	Trading	Teaching	Artisan	Not Tea-ching	Total
Males	30 (61.2)	6 (12.2)	6 (12.2)	1 (2.0)	2 (4.1)	4 (8.2)	49(100)
Females	13(41.9)	10 (32.3)	4 (12.9)	2 (6.5)	0 (0)	2 (6.5)	31 (100.0)
Total	43 (53.8)	16 (20.0)	10 (12.5)	3 (3.8)	2 (2.5)	6 (7.5)	80 (100.0)
No of persons	1–3	4–5	6	7	8	9	Total
Males	21(42.9)	1 (2.0)	13 (26.5)	13 (26.5)	1 (2.0)	0 (0)	49(100)
Females	4 (12.9)	0 (0)	18 (58.1)	7 (22.6)	1 (3.2)	1 (3.2)	31(100)
Total	25 (31.3	1 (1.3)	31 (38.8)	20 (25.0)	2 (2.5)	1 (1.3)	80(100)
(100.0)							
	Income level in naira per month						
	≤-20,000	20,001–30,000	30,001–40,000	40,001–50,000	50,001–60,000	60,001–70,000	>70,000 & above
Males	13 (16.3)	8 (10.0)	11 (13.8)	11 (13.8)	2 (2.5)	1 (1.3)	3 (3.5)
Females	5(6.3)	8(10.0)	6(7.5)	7(8.8)	2(2.5)	0(0)	3(3.8)
Total	18(22.6)	16(20.0)	17(21.3)	18(22.5)	4(5.0)	1(1.3)	6(7.6)

Note: Values in parentheses are percentages
Source: Field survey, 2020

Most of the respondents were farmers (53.8 per cent), 20 per cent were civil servants and 12.5 per cent were traders. This result shows that farming is the major occupation of the respondents. As a result, many of the households could feed themselves from their farms to reduce the effect of food price changes. However, the danger was that they might deplete their seed stock for the next planting season.

Household size or family size refers to the number of people in a household who share a common expenditure or budget. The family size has a mean value of 5 with a standard deviation of 3 while the minimum and maximum were 1 and 8 respectively. This implies that the respondents have fairly large families. Large households face a greater challenge in food price changes resulting from the pandemic because it will increase their consumption expenditure. In Nigeria half of the household expenditure goes to food (NBS 2019).

Respondents with a monthly income of less than NGN 20,000 (22.6 per cent) dominated, which implies that most of the respondents were low-income earners who are more prone to food price changes. Mkhawani et al. (2016) stated that rising food prices can negatively affect the health of poor households thereby making it more difficult for them to meet basic food requirements. Low-income earners spend most of their income on food (Zezza *et al.* 2008).

Foodstuff price analysis using price index

The food price index is a composite of the inflationary rate. November 2019 was taken as the base month for the food price computation because it was between the October harvesting period, when plentiful supply reduced prices, and the Christmas season, when demand was the highest, thus raising prices (see Table 2). The pandemic shocks were signalled shortly afterwards. In Southeastern Nigeria, where the study was conducted, major food crops like yams, beans and rice are harvested in October.

Food prices showed a very high inflationary rate, as can be seen from Table 2. Garri (a cassava derivative), rice, yams and potatoes were among the carbohydrates with the highest inflationary rate even though they are locally produced. This raises an important question about the food security status of the nation, as higher food prices could result in a lower quantity and quality of food intake. This result agrees with the reports of Polly-Mbah, Ohaka and Mkpado (2010) and Mkpado and Arene (2012), that these carbohydrate staples are price-sensitive and competitive in food markets (see also Ifejirika, Arene and Mkpado 2013).

The price of beans was more stable and showed a deflationary trend apparently because the consumption of carbohydrates exceeds that of legumes. Also, common beans (white or brown) have many substitutes, which are regarded as underutilised crop species and which are gaining market share due to their lower price. This is illustrated in Table 4. Beef, chicken, eggs, Titus fish and catfish, which are highly valued animal protein sources, also indicated price inflation. The result concurs with Abalaka, Mkpado and Ugwu (2013), who noted that animal proteins are more expensive than crop sources in Imo State, Nigeria (see also Mkpado, 2016).

Table 2: Foodstuff price analysis using the price index

Types of Food	19 Nov⁺ Base Year Price In Naira	20 Jan	20 Feb	20 Mar	20 Apr	20 May	20 Jun	20 Jul
Agric. eggs, medium size	501.9	0.997	0.953	1.011	1.012	1.025	1.028	1.036
Beans, brown	465.31	0.873	0.85	0.883	0.922	0.925	0.921	0.936
Beef, bone in	1089.08	1.044	1.1	1.08	1.091	1.099	1.084	1.118
Beef, boneless	1484.21	0.991	1.011	0.982	1.021	1.03	1.029	1.025
Bread, sliced 500g	279.55	1.061	0.924	0.906	1.091	1.128	1.082	1.121
Bread, unsliced 500g	255.71	1.059	0.941	0.909	1	1.011	1.003	1.007
Broken rice (*Ofada*)	532.75	1.005	1.006	1.032	1.041	1.053	1.054	1.059
Chicken feet	675.32	1.009	1.037	1.088	1.185	1.186	1.203	1.237
Chicken wings	1200	0.996	1	0.983	1	1.033	1.083	1.111
Evaporated tinned milk, Carnation 170g	172.39	1.035	1.018	1.015	1.016	1.023	1.015	1.029
Evaporated tinned milk (Peak), 170g	195	0.989	0.983	1.007	1.012	1.022	1.015	1.031
Frozen chicken	1944.44	0.975	0.953	0.925	0.937	0.981	1.008	1.018
Garri, white	172.73	1.037	1.094	1.158	1.638	1.643	1.514	1.605
Garri, yellow	196.6	1.086	1.149	1.252	1.664	1.675	1.54	1.626
Rice agric., sold loose	480	0.949	0.935	0.905	0.995	1.026	1.01	1.018
Rice local, sold loose	400.74	1	0.992	0.966	1.031	1.049	1.022	1.032
Rice, medium-grain	473.62	0.908	0.889	0.87	1.003	1.024	1.025	1.04
Yam tuber	196.11	1.002	0.958	0.796	1.047	1.068	1.086	1.231
Sweet potato	107.04	1.425	1.241	1.427	1.494	1.434	1.367	1.408
Titus, frozen	1004.49	0.971	0.911	0.966	1.015	1.053	1.07	1.089
Catfish, dried	1236.43	0.978	0.994	1.006	1.041	1.0451	1.062	1.107
Mackerel, frozen	982.2	0.957	0.932	0.892	0.958	1.041	1.103	1.123
Maize grain, white	227.51	0.88	0.848	0.916	0.967	0.991	0.967	0.997
Maize grain, yellow	235.35	0.893	0.841	0.914	1.01	1.017	0.981	1.002

Food consumption and adjustments to protein intake

The high food prices caused consumers to adjust their food consumption with respect to protein. Table 3 shows that most consumers ate carbohydrates more than any other food group during the period of study (March to June 2020).

Table 3: Food consumption and adjustments to protein intake

What is the major type of processed food you consume?			Which of the following items did you not consume as usual during the pandemic due to their high prices?		
Food items	Frequency	%	Food items	Frequency	%
Fish	27	33.75	Fish	11	13.75
Meat	13	16.25	Meat	10	12.5
Vegetables/ Fruit	20	25.00	Eggs	38	47.50
Dairy/milk	13	16.25	Milk	38	47.50
Carbohydrate	52	65.00	Beans	2	2.50
Legumes	36	45.00	Other	14	17.50
Total	161*		Total	113*	

Note: * =multiple responses recorded

Source: Field Survey, 2020

Furthermore, most respondents did not consume eggs and milk (47.5 per cent) because of their high cost during the pandemic period. Consumers' preferences for cheaper and less perishable foods and the interrupted access to fresh and more perishable foods in many countries, are leading to increased consumption of non-perishable staple foods like yam, most of which lack micronutrients except if supplemented (GAIN 2020).

It could be inferred that Table 3 is an indication that food preferences may have changed, whereas Table 4 is the confirmation. Some 85 per cent of the respondents agreed that they changed their food intake during the period of study (March to June 2020) (Table 4). This demonstrates that the pandemic hit consumption patterns hard, and that consumers had to change their food choices to manage the rising food prices during that time. Of the food items they added to their diet during this time were neglected and underutilised crops, particularly non-regular cowpea (*Mucuna*, or *Cajanus cajan*) (47.5 per cent) and water yam (46.25 per cent).

Table 4 implies that the rise in food prices prompted consumers to shift their food intake from common staples and perishable food items to neglected and underutilised foods that have fallen out of use and which are relatively cheaper. Iheme *et al.* (2020) reported that households in Nigeria consumed less expensive or less preferred foods as a coping strategy during the Covid-19 pandemic lockdown. In addition, 50 per cent of the respondents spent less on some commodities, such as clothing and alcohol, to save money for food for the household. Mkpado (2013b) noted that the

development of harvesting equipment that will not cause bruising to the crops is one way that Africa, and Nigeria in particular, could improve food security and resilience from economic shocks.

Table 4: Consumption expenditure adjustments and intake of neglected and underutilised crops

Have your food preferences changed during the period?	Frequency/ %	Which of these did you add to your diet?	Frequency/ %	Which of the following items did you spend less on during the pandemic?	Frequency/ %
Yes	68(85.00)	Yellow yam	27(33.75)	Clothing	40(50)
No	7(8.75)	Water yam	37(46.25)	Phone calls	9 (11.25)
I don't know	5(6.25)	Non-regular cowpea (*Mucuna/ Cajanus cajan*)	38 (47.5)	Medicines and drugs	6(7.5)
		Short bananas	14(17.5)	Alcoholic drinks	35(43.75)
Total	80(100)	Total	116*	Total	90*

Note: * = multiple responses recorded

Source: Field Survey, 2020

Differences in eating habits and meal regimen before and during Covid-19

Eating habits and associated changes in the number of meals are critical adaptation models for dealing with hunger. Besides illustrating people's meal regimen, Table 5 shows that the number of respondents who ate once a day only increased by 5 per cent during the Covid-19 period and the number who ate twice a day only increased by 19.5 per cent. Unfortunately, the number of households who ate three times a day or more decreased, and even though those who managed three meals a day tried to maintain that level, the food quality was worrisome. The quality was better when prices were cheaper, as noted in Table 2. This result supports Mkpado (2012b) and Iheme *et al.* (2020), who noted that people reduced the frequency of meals to survive global economic, financial and food crises.

The nature of the data cannot fit into a t-test. The authors therefore considered three categories of meal regimen together at two points in time – that is, before November 2019 and during Covid-19 (March to April 2020).

Table 5: Differences in eating habits and regimen before and during Covid-19

BEFORE COVID-19		DURING COVID-19		REMARKS	
No of times	**Frequency/ %**	**No of times**	**No of times**	**Frequency/ %**	
Once	1(1.3)	Once	0-1-0	3(3.8)	Increased by 5%
-			1-0-0	2(2. 5)	
			0-0-1	1(1.3)	
Twice	18(22.5)	Twice	0-1-1	14(17. 5)	Increased by 19.5%
-	-	-	1-0-1	27(33.8)	
Three times	51(63.8)	Three times	1-1-1	33(41.3)	Decreased by 22.5%
More than three times	10(12.5)	More than three times	1-1-1-1	-	Decreased by 12.5 %
Total	80(100.0)			80(100.0)	
Chi-square		Value	Df	Asymp. Sig. (2-sided)	
Pearson chi-square		29.296	15	.015	
Likelihood ratio		40.193	15	.000	
Linear-by-linear association		.052	1	.819	
N. of valid cases		80			
Nominal by nominal		Value	Approx. Sig.		
Contingency coefficient		.518	.015		
N of valid cases		80			

The chi-square test in Table 5 is significant with a value of 29.296, which indicates a 1 per cent probability level with 15 degrees of freedom. The result is acceptable because its likelihood ratio and contingency coefficient were also significant. The report concludes that people's meal regimen changed, with more people reducing the number of meals per day.

Table 6 shows the respondents' reception, perception and sources of palliative measures as an adaptation to cushion the effect of the pandemic.

The result shows that 63.75 per cent of the respondents received palliative aid during the pandemic, most of which came from individuals and a small fraction from the church and government.

On the distribution of palliative measures, 28.75 per cent of the respondents lamented that the process was tainted with corruption and nepotism and most opined that the provisions were inadequate. This shows the degree to which corruption and nepotism marred the process. Eranga (2020) affirmed this in his report, which showed that residents claimed that

the process of distribution of palliative aid had been politicised. Omaka-Amari *et al.* (2020) therefore recommended that the government should supervise the distribution of relief materials across the states, to ensure that the aid reaches the target population.

Table 6: Reception, perception and sources of palliative measures

Did you receive any palliative measures during the pandemic?	Frequency / %	From whom did you receive palliative aid?	Frequency / %
Yes	51 (63.75)	Government	5(6.25)
No	29 (36.25)	Church	6(7.5)
How would you describe the distribution of the palliative aid?	Frequency / %	Philanthropy	10(12.5)
Fairly/equally	8(10)	Non-governmental organisation	1(1.25)
Corruption/nepotism	23 (28.75)	Friends/relatives	29(36.25)
Very adequate	1(1.25)	Total who received	51(63.75)
Not adequate	65(81.25)	I did not receive	29(36.25
Total	97*	Total respondents	131(100)

Note: *Values in parentheses are percentages
Source: Field Survey, 2020

Table 7 illustrates the common types of palliative aid given and received. Money, food or both, and medical services, among other forms, made up 63.75 per cent of the assistance. Of the food stuffs, *garri* accounted for 51.25 per cent, followed by spaghetti and Indomie noodles (a synthesis of cereals) and rice. Yams accounted for only 8.75 per cent partly because yam was not in season during that period (May to June 2020).

It is instructive that the group of donors of food items were the same as those who gave money, in that friends and relatives as well as church organisations took the lead. A far greater percentage of palliative funds came from friends/relatives/philanthropists (21.25 per cent), averaging NGN 20,916.67. Very little came from the church and government. It has been noted that cushioning the whole economy and all citizens from price shocks is beyond the capacity of developing economies in Africa (GAIN

2020; Mkpado 2013a). However, the Nigerian government has opened up its borders and made rice imports duty-free to reduce the hunger caused by global economic, financial and food crises (Mkpado 2012a).

Table 7: Types of food and other forms of palliative aid

What did you receive?	Frequency	%	What type(s) of food did you receive more during the Covid-19 period?	Frequency	%
Money only	7	8.75	Yam	7	8.75
Foodstuff only	21	26.25	Rice	26	32.5
Money and food	17	21.25	Beans	5	6.25
Clothes	0	0	Garri	41	51.25
Medical services and medication	2	2.50	Indomie/ spaghetti	28	35.00
Others	4	5.00	Total	107	
Total that received	51	63.75			
Those that did not receive	29	36.25			
Source: Field Survey, 2020					

In line with Table 6, Table 9 indicates that the government did not really provide much to its citizens. Rather, friends/relatives/philanthropists were at the forefront, ensuring that the masses, especially the rural poor, were helped to put food on their table. Giving alms is often encouraged, but its usefulness is crucial in changing recipients' welfare. Opinions vary on the usefulness of palliative assistance received during Covid-19 in many parts of Nigeria. Video clips showed peoples' contempt for a small loaf of bread given to a family, claiming that it was not good for even a quarter of a meal on a menu (*Newsbreak* 2020). Among those who received any form of palliative aid, 40 per cent said it was very useful whereas most (60 per cent) said it was only moderately useful. On the other hand, 88.6 per cent of those who did not receive aid said it was not useful to them. It could be noted that for something to be useful, you don't need to receive it directly.

The opinions of the respondents were subjected to the chi-square test. The result is significant, with a value of 69.029, indicating a 1 per cent probability level. The result is acceptable because the likelihood ratio and contingency coefficient were significant. Thus, the usefulness of palliative aid is dependent on receiving the assistance, as most of those who received it said it was useful, and most of those who did not receive it said it was not useful. Palliative aid needs to be expanded to reach many more people.

Table 8: Sources of palliative funds

Sources of financial aid	N. of recipients/%	Average amount (NGN)	Total amount (NGN)
Government	3(3.75)	350	9,750
Churches/non-government	4(5)	1,000	4,000
Friends/relatives / philanthropists	17(21.25)	16,666.67	283,333.4
Total	24(30)	20,916.67	297,083.4

Note: Values in parentheses are percentages

Source: Field Survey, 2020

Table 9: Chi-square tests of the usefulness of palliative measures

Palliative Aid Reception	View of Respondents on Palliative Aid / %				
Did you receive palliative aid?	Not useful	Moderately useful	Very useful	I don't know	Total
Yes	0(0)	27(60.0)	18(40.0)	0(0)	45(100.0)
No	31(88.6)	3(8.6)	0(0)	1(2.9)	35 (100.0)
Total	31(38.8)	30(37.5)	18(22.5)	1(1.3)	80(100.0)
Chi-square tests	Value	Df	Asymp. Sig. (2-sided)		
Pearson chi-square	69.029(a)	3	.000		
Likelihood ratio	90.145	3	.000		
Linear-by-linear association	45.595	1	.000		
N. of valid cases	80				
Nominal by nominal		Value	Approx. Sig.		
Contingency coefficient		.681	.000		
N. of valid cases		80			

Note: Values in parentheses are percentages

Source: Field Survey, 2020

Financial support for the livelihood of poor households continues to be a problem in development finance. Table 10 illustrates the amounts borrowed and from where. Few borrowed from banks; most borrowed from friends

and relatives or from self-help groups. This distribution was subjected to a chi-square test, and the result in Table 10 is significant. The chi-square test has a value of 13.5, which indicates a 5 per cent probability level, with 6 degrees of freedom. The result is acceptable because of its significant likelihood ratio and contingency coefficient. The indication is that poor households are far less predisposed to borrowing from banks. This is apparently due to bureaucratic processes. However, they are much more likely to borrow from friends and relatives as well as self-help groups. It is no wonder that a number of studies are recommending the use of co-operative groups in credit administration among poor farmers (Mkpado and Arene 2006; Ohaka *et al.* 2017).

Table 10: Amount borrowed and source of borrowing during Covid-19

Amount Borrowed	Source of Borrowing			Total
NGN	Banks / %	Friends and relatives / %	Self-help groups /Isusu / %	Number / %
10,000.00	0(0)	3(33.3)	1(11.1)	4(44.4)
35,000.00	1(11.1)	0(0)	0(0)	1(11.1)
65,000.00	0(0)	0(0)	1(11.1)	1(11.1)
100,000.00	0(0)	3(33.3)	0(0)	3(33.3)
Total	1(11.1)	6(66.7)	2(22.2)	9(100.0)
Chi-square tests		Value	Df	Asymp. Sig. (2-sided)
Pearson chi-square	13.500(a)	6	.036	
Likelihood ratio	10.778	6	.095	
Linear-by-linear association	.015	1	.902	
N. of valid cases	9			
Symmetric measures	Value	Approx. Sig.		
Nominal by nominal				
Contingency coefficient	.775	.036		
N. of valid cases	9			

Note: Values in parentheses are percentages

Source: Field Survey, 2020

It is human nature to plan to manage risks. The perception of the type and nature of the risk often derives from the shock experienced. For many developing economies, like Nigeria, it is a pity that incessant economic shocks, social and food insecurity mean that its people have to plan for these eventualities. Table 11 illustrates some of the challenges people faced during the period of study. Economic and financial needs were the most critical, and food needs were second. Social and emotional as well as medical needs were also reported. All these challenges existed already but were apparently worsened by the lockdown to curtail the spread of the virus, which restricted movement and business activities and thus exposed people to more difficulty.

The response to the question, 'How do you want to receive help(s) in case of any shock?' is reported in Table 11. The use of insurance, friends and relatives, and government aid received a higher score than non-government/church aid. This shows that people still hope and expect government to assist them as their friends/relatives will do. This is a good challenge to unresponsive governments. The use of insurance is another opportunity that people are considering. It could be possible to use insurance policies to solve many of the problems that governments are not yet getting right. This is food for thought.

Table 11: Some challenges and anticipated sources of help in case of future shocks

What was/were your major challenge(s) during the pandemic?	Frequency/ %	How do you want to receive help in case of any shock?	Frequency/ %
Economic/finance	46 (57.5)	Insurance	38 (47.5)
Social/emotional	28 (35.0)	Government aid	38 (47.5)
Food needs	39 (48.75)	Non-government/ church aid	19 (23. 75)
Medical services	27 (33.75)	Friends/relatives	38 (47.5)
Total	**142***	**Total**	**135***

Note: *Multiple responses recorded
Source: Field Survey, 2020

Electronic transactions involve the use of mobile money. This financial innovation is proving to be a way of minimising the cost of purchases and the risk of carrying money around. An automated teller machine (ATM) card issued to account holders by their financial institution is one of the keys to using this innovation. However, having an ATM card does not

automatically compel one to engage in online transactions and/or point of service (POS) transactions. Furthermore, Internet fraudsters' pose many threats to consumers' financial transaction security.

Table 12: ATM/POS possession and usage (March to June 2020)

Do you have an ATM/POS card?	Frequency/%	Do you use an ATM/POS card?	Frequency/%	What items do people pay for with an ATM/POS card?	Frequency/%
Yes	69(86.3)	Yes	57(71.3)	Clothing	19(23.75)
No	11(13.8)	No	23(28.8)	Food items	19(23.75)
Total	80(100.0)	Total	80(100.0)	Electricity/water services	30(37.5)
Chi-square test	Value	Df	Asymp. Sig. (2-sided)	Medical services/drugs	17(21.25)
Pearson Chi-square	31.607	1	.000	Others	2 (2.5)
Likelihood ratio	32.223	1	.000	Total	87*
Linear-by-linear association	31.212	1	.000		
N. of valid cases	80				

Note: Values in parentheses are percentages;*= multiple responses recorded
Source: Field Survey, 2020

Table 12 shows that 86.3 per cent of respondents have an ATM card but only 71.3 per cent use it to make purchases. We examined the relationship between the possession of an ATM card and the types of purchases made with it. The chi-square test of this cross-tabulation was significant, with a value of 31.607, which is significant at a 1 per cent probability level. The likelihood ratio, contingency and coefficient are also significant, and thus indicate that possession of an ATM card is fundamental to using it for purchases.

The table also shows that during the study period, payment for services like electricity and water accounted for 37.5 per cent of the types of payments made. This was followed by purchases of food and clothing as well as medical services. It can be inferred that people like to use the ATM card to pay for services where security is higher. This may account for why Aron (2018) noted that the use of mobile money services is still very poor in Africa.

Conclusion

The Covid-19 pandemic, with its resultant lockdown and border closures led to the escalation of food prices to the extent that many households could no longer afford to put three square meals a day on the table for their families. This gave rise to untold hardship. Thus, there was an opportunity to examine food price changes and consumption adaptation models in Enugu state, Nigeria, during the pandemic and the usefulness of palliative aid given to the vulnerable by governments and non-governmental organisations. Primary data for the study was generated through a survey of eighty respondents, and secondary data was generated from monthly reports of food prices by the National Bureau of Statistics (NBS). The data was analysed using descriptive statistics, consumer price index and chi-square tests.

The results showed that most respondents were married, had tertiary education and a mean age of 52. Most were farmers, with a mean family size of five and an average monthly income of less than NGN 20,000. Food prices showed a very high inflationary rate during the pandemic period with many foodstuffs having a price index of more than 1.023. As a result, consumers made some adjustments in their food consumption with respect to protein. Most respondents agreed that they changed their food preferences during the study period, including consuming neglected and underutilised crops such as non-regular cowpeas and water yam. Half the respondents spent less on commodities like clothing and alcohol.

The number of people who ate once a day increased, as did the number who ate twice a day, and those who ate three times a day decreased. Most of the respondents received palliative assistance during the pandemic. Economic and financial needs were the most critical. Although most respondents possessed an ATM card, not all used it to make purchases.

Recommendations

From the results and conclusion of the study, the following important policy implications and recommendations emerged.

1. Government should encourage farmers to increase their production by providing them with loans and subsidies during a pandemic so as to provide enough food in those times.
2. The production and consumption of neglected and underutilised crops should be encouraged.
3. Government should have food reservoirs in case of national emergencies such as the Covid-19 pandemic.
4. Government should be responsive to the needs of its citizens in times like this and act timeously to curtail the suffering of its people.

5. Openness and transparency should be the watch word of people and organisations involved in delivering aid to the needy.

Acknowledgements

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