

## PERCEIVED EFFECTS OF FOOD PRICE INFLATION ON RURAL HOUSEHOLDS' FOOD SECURITY SITUATION IN ENUGU STATE, NIGERIA

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### ABSTRACT

**Objectives:** This study examined the perceived effects of food price inflation on the food security status of rural farming households' in Enugu state, Nigeria.

**Methods:** The 18-item USDA household food security survey module was used in determining the food security status of the respondents. Mean scores were used to analyze the perceived causes and effects of food price inflation, respectively.

**Results:** Majority of the households were food insecure, and the cost of production of major crops and prices of major staple foods had been on the increase for the 3 years (2016, 2015, and 2014) reviewed. The major cause of food price inflation was climate change while its major effects on household food insecurity were reduction in caloric intake, among others. Eating foods that are less preferred were the most frequently used coping strategy in cushioning the effects of food insecurity.

**Conclusion:** The findings reveal how food price inflation affects rural farming households' food security situation and thus assist the government and policy-makers to design and implement appropriate policy interventions.

**Keywords:** Agriculture, Climate change, Coping strategies, Food price inflation, Food security.

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### INTRODUCTION

Food is the most vital item in the hierarchy of needs of any household because of its centrality to human existence and such its security should be a first-order priority of national interest in any given country [1,2]. For a country to be food secure, the majority, if not all of her population, must "at all times have physical, social, and economic access to sufficient, safe, and nutritious food to meet their dietary needs and food preference for an active and healthy life" [3]. On the other hand, household food insecurity exists when people in the household "lack sustainable physical or economic access to enough safe, nutritious, and social acceptable food for a healthy and productive life" [4]. Household food insecurity exists not only due to food shortages but also lack of access to food due to high food prices [5]. Furthermore, high food prices adversely affect access to food by the rural poor since they spend most of their income to buy food they cannot produce [6] leaving them with less disposable income. People's access to food is determined to a great extent by the price of food at any given time. There has been an upsurge in food price around the world recently, which has left many households in a state of food insecurity [7,8].

Food price inflation exists when there is a sustained and continuous rise in the general price level of foods. Food price inflation has serious implications for the food security of any nation [2]. Nigeria is also faced with the challenge of food price inflation as it is highly dependent on food importation. High food prices in global market mean the same in the domestic markets [9]. An analysis of the National Bureau of Statistics trend in domestic food and non-food prices in Nigeria between 2003 and 2011 by Chiripanhura and Nino-Zarazua [10] revealed that the food prices in Nigeria had experienced a steady long-term upward trend, characterized by short-term variability with pronounced peaks and troughs between mid-2000s and early 2008, which corresponded to the rise and fall of international food staples. Furthermore, Egwuma *et al.* [11] highlighted the fact that there has been an upsurge in food prices at double digits in recent years, with a peak value of 20.32% recorded in September, 2017. No wonder [12] categorized Nigeria, among other countries in sub-

Saharan Africa, as being highly vulnerable to a surge in the prices of food globally.

Furthermore, the prices of staple foods have been on increase due to economic recession in Nigeria [11,13]. This has been attributed to the poor state of the economy characterized by the reduction in the supply of commodities, rises in fuel prices and to greater portion the devaluation of naira [11]. Despite the country's abundant human and material resources as well as increases in domestic food output between 2012 and 2015 [14], the food and agriculture organization [15], report revealed that 7.1 million Nigerians are facing acute food insecurity. Nwankpa [16] added that the current economic recession in Nigeria coupled with hyperinflation has resulted to increased hunger and malnutrition. Increases in the rate of malnutrition resulting to poor health status and increased vulnerability to diseases are all as a result of reduced nutritional intake of many Nigerians affected by rising food prices [3].

Rural farming households are vulnerable to price changes due to the fact that they rely on purchasing their food requirement from the market possibly because of their limited farm output or the seasonality of food production [17]. They also depend on the market for some foods that they do not produce. Hence, an increase in food price may reduce the income of rural farming households, thereby reducing their purchasing power and shifting available income on foods [18].

Furthermore, while most of the existing literature [2,19,20] focuses on the effect of food price inflation on household food security status during the food crises of 2007-2008, little is known about the effects of the recent food price inflation on food security status of rural households in Nigeria. It is, therefore, important to assess the effects of food price inflation on the food security situation of rural farming households. Hence, this study sought to determine the household food security status of the respondents; ascertain the causes of food price inflation from the perspective of the respondents; ascertain the perceived effects of food price inflation on the household food security status; identify

the livelihood choices made by the households as a result of food price inflation; and ascertain the coping strategies used by the households.

## METHODOLOGY

### Study area

The study was carried out in Enugu state, Nigeria. It lies between latitude of 6.5 (6°30'N) and longitude of 7.5 (7°30'E), within the tropical forest and savannah belts. Its temperature is characteristics of a tropical climate with mean daily temperature of about 26.7°C. It occupies an area of about 802,295 km<sup>2</sup> [21], with a population of about 3,257,278 [22]. The state comprises 17 political local government areas (LGAs), which are divided into six agricultural zones, namely, Enugu zone, Agbani zone, Udi zone, Agwu zone, Nsukka zone, and Enugu Ezike zone. This area has a rich agricultural land, thus most of the inhabitants are either full time or part-time farmers. They produce food crops such as rice, yam, cassava, maize, banana, cocoyam, and a variety of fruits and vegetables. They also produce cash crops such as oil palm and cashew. Livestock such as goat, sheep, pig, and poultry are equally domesticated.

### Sampling procedure

The population of the study consisted of all rural households who were engaged in either crop/livestock farming or both as a primary and secondary occupation. Multistage sampling procedure was employed in selecting respondents for the study. In the first stage, two senatorial zones (Enugu East and Enugu North) were selected through simple random sampling technique out of the three zones in the state. In the second stage, one LGA (Udi and Nsukka) was selected from each of the selected zones through simple random sampling technique giving a total of two LGAs. Furthermore, in the third stage, two town communities (Edem Ani and Okpuje from Nsukka LGA and Ngwo Uno and Umu Oka from Udi LGA) were selected through simple random sampling technique from the selected LGAs giving a total of four town communities after which two village communities were selected randomly from each of the selected town communities giving a total number of eight village communities. Finally, in the fourth stage, a list of farming households was collected from the community leaders in each village community, out of which 10 farming households were selected from each village through simple random sampling technique. The head of the household responded to the questions raised. Thus, a total of 80 farming households/respondents constituted the sample for the study.

### Data collection

Data for this study were collected between April and May 2017. Mixed research design comprising qualitative and quantitative research methods was used in eliciting information from the respondents. Qualitative data were collected from the respondents through focus group discussions (FGDs) and field observations. The FGDs comprised a group of 10 men and women who had rich experience about the food security phenomenon discussed. Participants for the FGDs were purposively selected by the local leaders in four communities where the meetings were conducted. Information generated during the FGDs included perceived food security situation of households in the communities, prices of staple foods over the past 3 years, as well as coping strategies employed by the households in cushioning the effects of food price induced food insecurity. Outcomes of the FGDs informed the development of the questions for household surveys. Quantitative data for the study were collected through the use of semi-structured questionnaire in the form of household surveys in which the respondents were asked to indicate their socioeconomic and demographic characteristics, food security situation, livelihood activities, and coping strategies. In each household, the main providers of food (household heads and their wives, in the case of a male-headed household or the females in the case of a female headed household) provided answers to the questions asked during the household survey. Content validity of the instruments for data collection was validated by experts from the Departments of Agricultural Economics and Extension, University of Nigeria Nsukka.

### Data analysis

To determine the food security status of the rural farming households, the 18-item USDA household food security survey module was used. The 18 items include 18 questions about their food security situation over the past 30 days preceding the study. The questions were ranged in severity from worrying about running out of food to children not eating for a whole day. Their responses to each question were coded as either affirmation or negative in which case the response choice was either yes or no. Household was classified as food secure if the respondents answered affirmatively to <3 of the 18 questions, whereas three or more positive responses place the household in food insecure range. For households with children (and 18 relevant scale items), those with 3-7 positive answers were classified marginally food security, those 8-12 as low food security, and those with > or = 13 as very low food security. It is important to note that the main person (in most cases women) who prepares food in the house responded to the questions about the household food security status. To ascertain the respondents perceived causes of food price inflation, they were asked to indicate their responses on a 5-point Likert type scale with response options; strongly disagree = 0, disagree = 1, undecided = 2, agree = 3, and strongly agree = 4. The cutoff mean was 2. To get the mean values used for the decision rule, 0.05 was added to 2 and also subtracted by 2 to give 1.95. Thus, variables with responses  $\geq 2.05$  were regarded as major causes, while responses with mean values  $\leq 1.95$  were regarded as minor causes. The perceived effects of food price inflation on household food insecurity were achieved by measuring their responses on a 5-point Likert-type scale with options; to a very great extent = 4, to a great extent = 3, to a moderate extent = 2, to a slight extent = 1, and not at all = 0. The cutoff mean was 2. Variables with responses  $\geq 2$  were regarded as major effects, while variables with responses <2 were regarded as minor effects.

To identify the livelihood choices made by the respondents as a result of food price inflation over the past 3 years preceding the study, the respondents were asked to indicate the livelihood activities they engage in. Their choices were later ranked according to the frequency of their response to a particular livelihood activity. To determine the coping strategies used by the households, a 5-point Likert-type scale with response option never = 0, rarely = 1, often = 2, sometime = 3, and always = 4 was used. The cutoff mean was 2. Strategies with responses  $\geq 2$  were regarded as frequently used coping strategies, while those with mean scores <2 were regarded as less frequently used coping strategies. Quantitative data for the study were analyzed using percentage, frequency, and mean scores, while qualitative data were analyzed using thematic analysis.

## RESULTS AND DISCUSSION

### Food security situation of rural farming households

#### Perception of household food security situation over the past 3 years

Table 1 shows that 42.5% of the respondents believed that their food security situation had been worst during the past 3 years, while 37.5% of them believed that it had been much worst. The remaining 20.0% believed that it had been a little worst. This implies that a greater proportion of the respondents may not have had the ability to meet their food consumption requirements over the past 3 years possibly as a result of the galloping prices of staple food. This could have serious implications on their household food security situation.

**Table 1: Percentage distribution of respondents by household food security situation**

Food security situation	Frequency	Percentage
Perception of household food security for the past 3 years.		
A little worst	16	20.0
Worst	34	42.5
Much worst	30	37.5

### Food security level of the respondents

Based on the computation of the food security scores of the respondents from the 18-item household food security survey module, 68.8% of the respondents were classified as having a very low food security level, while 23.8% of them were classified in low food security level. Furthermore, 5.0% and 2.5% of the respondents were classified on high food security and marginal food security levels, respectively, as indicated in Fig. 1.

### Food security status of the respondents

The result further indicates that the majority (92.5%) of the respondents were food insecure, while 7.5% were food secure, as indicated in Fig. 2. This implies that the majority of the households were not able to have adequate access to food which would enable them to meet their daily dietary requirements. This is in agreement with the findings of Akinyele [23] who reports that a large proportion of Nigerians are food insecure most of whom are found in the rural areas. This is also in line with the

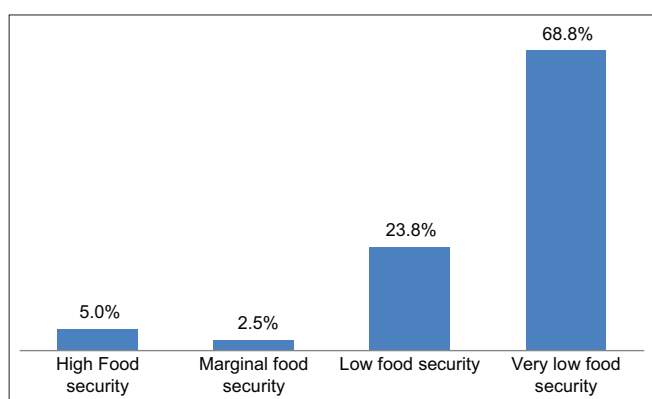


Fig. 1: Food security level of the respondents

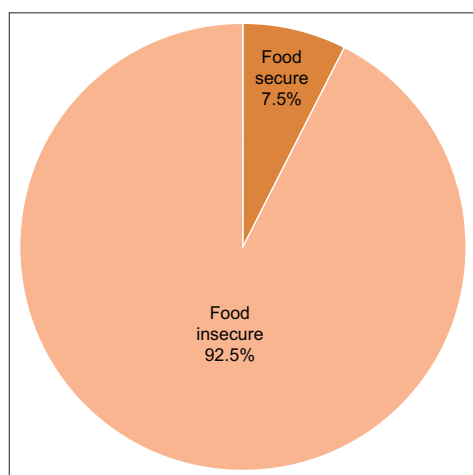


Fig. 2: Food security status of respondents

findings of Adeniyi and Ojo [24] who report that there is a high incidence of food insecurity in rural Nigeria. The food insecurity situation of the respondents may be in connection with the current food price inflation, among other factors, which could affect their access to adequate food.

### Perceived causes of food price inflation

#### Average output and cost of production of major staple food items

Entries in Table 2 show the major crops produced and cost of production in the stated years in the study area from the perspective of the respondents. Among the major crops produced, maize had an average output of 221.46 kg and average cost of production of N12,773.53 in 2014, 181.00 kg and N15,513.04 in 2015, and 158.63 and N22,134.21 in 2016. Cassava had an average output of 869.38 kg, 786.67 kg, and 738.33 kg, with average cost of production of N12,357.14, N16,600.00, and N20,800.00 in 2014, 2015, and 2016, respectively; cocoyam with an average output of 482.92 kg and average cost of production of N10,000 in 2014, 450.56 kg and N13,942.11 in 2015, and 403.33 kg and N17180.92 in 2016.

The percentage increase in the cost of production of maize between the years 2014 and 2015 was 21%, while between 2015 and 2016 was 42%, cassava was 34% between 2014 and 2015, while 2015 and 2016 was 37%. For cocoyam, it was 39% between 2014 and 2015 and 23% between 2015 and 2016. Percentage decrease in output for maize between 2014 and 2015 was 18% while that between the years 2015 and 2016 was 12%. The percentage decrease in output for cassava between the years 2014 and 2015 was 12% while that between the years 2015 and 2016 was 6%. The percentage decrease in output for cocoyam for the year 2014 and 2015 was 7% while that between 2015 and 2016 was 11%. For yam, the percentage decrease in output between the years 2014 and 2015 was 5% while that between 2015 and 2016 was 1%. Pepper had percentage decrease in output of 6% between the years 2014 and 2015, while that between 2015 and 2016 was 10%.

The result shows that while the cost of production of the staple crops was on increase, outputs were declining. The decline in output may be as a result of inadequate access to high-quality seeds, inadequate fertilizer use, high cost of production, and poor production systems, among other factors. Decreased output of crop produce could have affected the availability of food through production, thereby contributing immensely to reduced food access and subsequent food insecurity of the respondents.

#### Major staple food items bought and cost of purchase

Table 3 shows the major food items and cost of purchase in the stated years by the respondents. Among the major food items purchased, maize was bought with average quantity of 16.90 kg and average cost of N1555.00 in 2014, 16.68 kg with cost of N1850.00 in 2015, and 14.18 kg with cost of N2200 in 2016; rice with average quantity of 19.98 kg and average cost of N3379.76 in 2014, 19.19 kg with average cost of N3441.67 in 2015, and 16.49 kg with cost of N4273.47 in 2016; beans with average quantity of 18.29 kg and cost of N3052.63 in 2014, 16.17 kg and N3085.19 in 2015, and 15.94 kg and N3885.10 in 2016.

The percentage increase in price of maize between the years 2014 and 2016 was 2% while between 2015 and 2016 was 18%, rice was 2%

Table 2: Average output and production cost of some staple crops cultivated in the years 2014, 2015, and 2016

Crop	Average output (kg) in year 2014	Average cost (N) in year 2014	Average output (kg) in year 2015	Average cost (N) in year 2015	Average output (kg) in year 2016	Average cost (N) in year 2016	Average % decrease in output	Average % increase in cost of production
Maize	221.36	12,773.53	181.36	15,513.04	158.63	22,134.21	15	32
Cassava	869.38	12,357.14	786.67	16,600.00	738.33	22,800.00	8	36
Cocoyam	482.92	10,000.00	450.83	13,942.11	403.33	17,180.95	9	31
Yam	445.56	12,420.57	425.56	16,380.00	421.13	21,662.50	3	32
Pepper	588.44	39,333.33	554.37	49,882.35	498.44	54,555.56	8	18

**Table 3: Average quantity bought and cost of some staple food items purchased by the respondents for the years 2014, 2015, and 2016**

Crop	Average quantity (kg) bought in year 2014	Average cost (N) of purchase in year 2014	Average quantity (kg) bought in year 2015	Average cost (N) of purchase in year 2015	Average quantity (kg) bought in year 2016	Average cost (N) of purchase in year 2016	Average % decrease in quantity bought	Average % increase in cost of purchase
Maize	16.90	1555.00	16.68	1850.00	14.18	2200.00	8	10
Rice	19.98	3379.76	19.19	3441.67	16.49	4273.47	9	13
Beans	18.29	3052.63	16.17	3085.19	15.94	3885.10	7	13
Cassava	280.00	16,473.68	270.34	20,600.00	255.35	30,900.00	5	38
Cocoyam	260.00	32,200.00	240.00	44,666.67	215.00	48,000.00	9	23
Yam	289.33	21,400.00	266.00	28,600.00	250.00	32,600.00	7	24
Bambara nut	25.00	2505.56	23	2685.71	19	3084.38	13	11

between 2014 and 2015, and 2015 and 2016 was 24%. For beans, it was 1% between 2014 and 2015 and 25% between 2015 and 2016. The percentage decrease in quantity of maize bought between the years 2014 and 2015 was 1%, and between 2015 and 2016 was 15%. Rice purchased between the years 2014 and 2015 was 4%, while that between 2015 and 2016 was 14%. The percentage decrease in quantity of beans purchased between the years 2014 and 2015 was 13%, while that between years 2015 and 2016 was 1%.

The result shows that the price of staple food items in the study area had been on the increase even with a decrease in the quantity of food purchased. This could reduce access to food by the respondents due to a decrease in their purchasing power. Poor people spend a greater part of their income on food and as such changes in food prices could reduce the quantity and quality of food purchased by the respondents. It has been established that high food prices, among other factors, have led to an increase in the number of malnourished people in Nigeria over the years [25].

#### Perceived causes of food price inflation

The major causes of food price inflation as perceived by the respondents (Table 4) include climate change (M=3.63); high cost of production of farm produce (M=3.60); oil price shift (M=3.57); and high transport cost (M=3.50). Climate change challenge has increased the risk of reduced crop productivity associated with heat and drought stress. Studies around the world indicate that crops are sensitive to changes in long-term temperature and precipitation [26]. Furthermore, climate change, along with its attendant effect on farmland productivity and water availability, poses substantial challenges to producing food at affordable prices. High cost of production of farm produce had been another pronounced cause of food price inflation. This could be because of the fact that respondents depend solely on internal source of credit in their production activities. Oil price shift had been another cause of food price inflation. This could be as a result of the fact that the current food system is highly dependent on vehicles conveying inputs to the farm, and transporting farm outputs to the markets for sale to the consumers. This is in agreement with the assertion of Zilberman *et al.* [27] that the high prices of crude oil may result to continuous food prices increase.

#### Perceived effects of food price inflation on household food security situation

Data in Table 5 show the perceived effects of food price inflation on household food security situation. The major effects of food price inflation on households' food security status include reduction in total caloric intake (M=3.47), poor access to food (M=3.40), and decline in the food stock of the households (M=3.26). Reduction in total caloric intake had been one of the perceived effects of food price inflation noted by the respondents. This may be because they eat any available food just to fill the gut without considering the nutritional value of the food. Usually, staples eaten alone or with very small amounts of other foods may result to the intake of poor quality and nutritionally inadequate food [28]. As food price increases, it leads to poor access to food as the households' income decline. Further increase in food price in the study area would lead to decline in the food stock of the household.

**Table 4: Mean score of perceived causes of food price inflation**

Causes of food price inflation	Mean	Standard deviation
High transport cost of moving food items to point of sale	3.50*	0.981
High food tariffs/taxes	3.12*	1.048
Population growth with shortage in food supply	3.25*	1.073
High cost of production of farm produce	3.60*	0.894
Poor agricultural policies relating to food production	1.91	1.009
Pest and disease outbreak on crops	2.94*	1.266
Imbalances in supply and demand of food	3.44*	0.793
Low/no adoption of farming technologies	1.61	0.921
Decreased food production as a result of poor agricultural practices	3.39*	0.987
Inadequate information on sustainable agricultural practices as a result of poor extension contact	2.98*	0.811
Reduction of cultivable land due to urban development	1.37	0.891
Oil price shift	3.57*	0.938
Diversion of crops for producing biofuels	1.49	0.871
Climate change	3.63*	0.891

\*Perceived causes

**Table 5: Perceived effects of food price inflation on household food security**

Variables	Mean	Standard deviation
Hunger	3.01*	0.974
Malnutrition	3.19*	0.915
Poor health condition	2.63*	0.998
Reduced agricultural productivity	1.88	0.933
Reduction in total caloric intake	3.47*	1.006
Decline in the food stock of the household	3.26*	0.882
Inconsistent availability of food stock of the household	2.59*	0.910
Scarcity of food	1.94	0.946
Poor access to food	3.40*	1.051
Poverty	2.26*	0.951
Reduced household income/savings due to increased expenditure on food	3.03	1.079

\*Perceived effects

Other perceived effects of food price inflation on households' food security status were malnutrition (M=3.19); reduced household income/savings due to increased expenditure on food (M=3.03); hunger (M=3.01); poor health condition (M=2.63); inconsistent availability of food stock of the household (M=2.59); and poverty (M=2.26).

#### Livelihood choices made by respondents in the past 3 years as a result of food price inflation

Data in Table 6 show that 72.5% of the respondents changed from monocropping to mixed cropping, 57.5% were engaged in gathering and

selling of fire wood, 51.3% engaged in processing of own crop before sale, 45.0% begged for financial support, 23.8% lease their property, 12.5% engaged in petty trading, and 3.8% moved from off-farm activities to wage labor in the past 3 years. This shows that the respondents were engaged in varied livelihood activities in other to generate more income to satisfy their daily dietary needs. Oluwatayo [29] opines that in addition to engaging in agricultural activities, which is the main source of income, rural farmers also engage in diverse non-agricultural income generating activities to improve their livelihood.

#### Ranking of livelihood contribution to income earned

Table 7 shows the ranking of the livelihood activities by the respondents according to contribution to income earned. Crop farming was ranked first, mixed farming second, livestock farming third; begging for financial support was ranked fourth with rent from property and processing of farm produce ranking fifth and sixth, respectively. This implies that agricultural activities (crop farming, mixed farming, and livestock farming) are major means of livelihood for the respondents. This is in agreement with Igbalajobi *et al.* [30] who opined that agriculture has been a cornerstone in Nigeria economy and about 90% of the rural dwellers derive their major income from its activities.

#### Perceived coping strategies used by household in the past 3 years

Table 8 shows that the majority (98.0%) of the respondents ate less preferred food, 97.5% reduced the quantity of food consumed, and

96.3% skipped one or two meals per day. To cope with household food insecurity, the respondents noted that they mostly changed their diets by switching from eating more preferred and expensive foods such as rice, yam, and sweet potatoes to less preferred and less expensive substitutes such as cassava in its processed form such as *garri*, *akpu*, and *abacha*. These less preferred foods are eaten more frequently, lesser quantity, and in less nutritious manner. For instance, some of the respondents said that usually *garri* and *akpu* are consumed with soups enriched with adequate meat, fish, and vegetables. However, as a result of the high cost of meat and fish, they sometimes cook soups without meat and fish but with only little crayfish and vegetables, thereby consuming less nutritional food. Furthermore, they consume processed cassava mostly because it gives them energy needed to carry out their farm activities actively. The respondents also indicated that they reduced the quantity of food consumed and skipped meals by eating ones or twice a day to manage available food. Gupta *et al.* [31] also noted that during acute food shortages, households first employ coping strategies that had to do with reducing the quality and quantity of food consumed. As food insecurity increases, the reduction in quantity of food consumed strategy became useful and subsequently skipping one or two meals per day.

Other strategies include 67.5% borrowing money to buy food, mother limiting their own food intake so that their children can eat (66.3%), increased use of credit for consumption purposes (46.3%), borrowing food from friends and relatives (7.5%), skipping eating for whole day (5.0%), and abandoning children (2.5%). Evidently, the respondents employ varied short-term measures to deal with the food shortage crisis resulting from food price inflation. These measures are aimed at increasing household food availability, decreasing the number of people to be fed in the household, dietary changes, and rationing or managing food shortfalls. The various coping strategies employed by households' are in agreement with Kyaw [32] who notes that "food insecure households employ a wide range of coping techniques that reflect the extent of their vulnerability." One of the greatest and complicated global challenges is attaining food security and as such the food insecure decides themselves on the best coping strategies to employ depending on their social and economic constraints [26].

#### Frequency of using coping strategies

Entries in Table 8 indicate that the most frequently used coping strategies by the respondents were eating foods that are less preferred, ( $M=2.81$ ), skipping one or two meals per day ( $M=2.72$ ), reduction in the quantity ( $M=2.66$ ), and mothers limiting their own food intake to ensure that their children get enough to eat ( $M=2.01$ ). This implies that even though households employ different coping strategies to cushion food insecurity, some coping strategies are more commonly used by households than others, especially those that are more convenient to them. Basically, the coping strategies most frequently employed by the households are shorter-term strategies to deal with the current food shortage in the home. Wilna *et al.* [33] also noted that the commonly used coping strategies by households were "cooking a limited variety of foods, maternal buffering by limiting the caregiver's intake to make food available for the children, skipping of meals, and limiting portion sizes."

**Table 6: Percentage distribution of respondents by livelihood choices**

Livelihood choices	Frequency	Percentage
Begging for financial support from family members friend, etc.	36	45.0
Leasing of property such as land and houses	19	23.8
Engaged in processing of own crop before sale	41	51.3
Changing from mono cropping to mix cropping	58	72.5
Moving from off-farm activities to wage labor	3	3.8
Petty trading	10	12.5
Gathering and selling of fire wood	46	57.5

**Table 7: Distribution of respondents according to the preference of livelihood contribution to income earning**

Livelihood activity	Frequency	Ranking
Crop farming	72	1 <sup>st</sup>
Mixed farming	18	2 <sup>nd</sup>
Livestock farming	7	3 <sup>rd</sup>
Begging for financial support	6	4 <sup>th</sup>
Rent from property	4	5 <sup>th</sup>
Processing of farm produce	1	6 <sup>th</sup>

**Table 8: Perceived coping strategies to food insecurity**

Coping strategies	Percentage	Frequency mean	Standard deviation	Severity mean	Standard deviation
Reducing the quantity of food consumed	97.5	2.66*	0.856	1.01	0.738
Eating less preferred foods	98.8	2.81*	0.618	1.21	0.610
Borrowing food from friends or relatives	7.5	0.17	0.628	2.16*	1.603
Borrowing money to buy food	67.5	1.70	1.371	1.64	1.022
Mother limiting their own food intake	66.3	2.01*	1.472	1.31	1.195
Skipping eating for the whole day	5.0	0.09	0.411	2.35*	1.744
Skipping one or two meals per day	96.3	2.72*	0.678	1.64	0.846
Reducing the number of people eating in the house	15.0	0.41	1.001	1.06	1.426
Increased use of credit for consumption purposes	46.3	1.12	1.324	1.35	1.233
Mortgaging and selling of assets	45.0	0.92	1.205	2.05*	1.517
Distress migration	25.0	0.60	1.127	1.20	1.363

\*Perceived coping strategies

**Table 9: Distribution of respondents according to the preference of perceived coping strategies employed by household to cushion the effects of food**

Coping strategies	Always	Sometimes	Often	Rarely	Never	Weighted index	Ranking
Eating less preferred foods	20	174	30	1	---	225	1 <sup>st</sup>
Skipping one or two meals per day	12	168	34	1	-	215	2 <sup>nd</sup>
Reducing the quantity of food consumed	56	87	70	-	-	213	3 <sup>rd</sup>
Mother limiting their own food intake	24	123	12	-	-	159	4 <sup>th</sup>
Borrowing money to buy food	4	111	6	13	-	134	5 <sup>th</sup>
Increased use of credit for consumption purposes	-	69	-	14	-	83	6 <sup>th</sup>
Mortgaging and selling assets	-	51	-	18	-	69	7 <sup>th</sup>
Distress migration	-	39	-	7	-	46	8 <sup>th</sup>
Reducing the number of people eating in the house	-	27	2	2	-	31	9 <sup>th</sup>
Borrowing food from friends and relatives	-	12	-	3	-	15	10 <sup>th</sup>
Skipping eating for the whole day	-	3	-	3	-	6	11 <sup>th</sup>

### Perceived severity of coping strategies

The perceived severity of the coping strategies employed by households over the past 3 years as revealed in Table 8 were as follows: Skipping eating for the whole day (M=2.35), borrowing food from friends or relatives (M=2.16), and mortgaging and selling of assets (M=2.05). This implies that the coping strategies to food insecurity employed by the respondents vary in severity. The severity of the coping strategy employed indicates the degree of food insecurity experienced by the households. Skipping eating food by a household for a whole day adds more credence to the fact that the respondents are facing worsening food security situation. According to the majority of the respondents, skipping food for a whole day is a strategy they employ to manage the shortfall in food availability at home.

### Ranking of coping strategies

Entries in Table 9 show that the respondents ranked eating less preferred foods first, skipping one or two meals as second, reducing the quantity of food consumed as third, mothers limiting their own food intake as fourth, borrowing money to buy food as fifth, increased use of credit for consumption purposes as sixth, mortgaging and selling assets as seventh, distress migration as eight, reducing the number of people eating in the house nine, borrowing food from friends and relatives as tenth, and skipping eating for the whole day as eleventh. This implies the ease to which the coping strategies can be used by the households. A household can easily eat anything available (less preferred food) to fill the gut than to go the whole day without food when given a choice. Furthermore, it was observed from the result that the respondents preferred to adopt food based technique of coping strategies such as eating less preferred food to non-food based techniques such as sale of assets during the time of food shortage. Thus, the respondents employed mostly food consumption coping strategies in which the quantity and quality of food has been compromised to mitigate the adverse effects of food price inflation on their food insecurity.

### CONCLUSION

This study has documented the fact that a great proportion of the study population was food insecure. The study further revealed an increase over the 3 years studied, in the cost of production of staple food as well as the corresponding increase in the price of food from the perspective of the respondents. Climate change and high cost of farm produce were among the major causes of food price increase while poor access to food, reduction in calorie intake, and decline in the food stock of household were among the major effects of food price increase on the household food security situation of the respondents. In response to the food price increase and subsequent food insecurity, the respondents made some livelihood choices such as diversifying into other agricultural and non-agricultural income generating activities. Major coping strategies used by the respondents were eating less preferred food, reducing the quantity of food consumed, and skipping one or two meals per day.

Therefore, it is recommended that there is a need for the government and policy-makers to make concerted efforts aimed at halting the

galloping increase in staple food price through providing an increase in the quantities of subsidized basic food items, strengthening consumer price controls, and imposing price ceiling on staple foods so as to improve the food security level of rural households. Furthermore, effective actions aimed at reducing food insecurity should be taken by the government such as establishing safety net programs aimed at improving the productivity of farmers so that the rural households can have adequate access to food.

### CONFLICTS OF INTEREST

The authors declare that there are no conflicts of interest.

### REFERENCES

- Holder MB. The contribution of food consumption to well-being. *Ann Nutr Metab* 2019;74 Suppl 2:44-51.
- Obayelu AE. Global food price increases and nutritional status of Nigerians: The determinants, coping strategies, policy responses and implications. *ARPN J Agric Biol Sci* 2010;5:67-81.
- Irohabe I, Agwu AE. Assessment of food security situation among farming households in rural areas of Kano state, Nigeria. *J Central Eur Agric* 2014;15:94-107.
- Food and Agriculture Organisation. Regional Overview of Food Insecurity: African Food Security Prospects Brighter Than Ever. Accra: Food and Agricultural Organization of the United Nations; 2015.
- Zakari S, Ying L, Song B. Factors influencing household food security in West Africa: The case of Southern Niger. *Sust* 2014;6:1191-202.
- Lerato P. Comparative Analysis of the Impact of Food Prices on Household Food Security: Evidence from the North-West and Kwazulu-Natal Provinces, South Africa, Masters Thesis. South Africa: University of KwaZulu-Natal; 2015. p. 1-3.
- Ularo KM. Food Inflation in Malawi: Implications for the Economy (No. 117802). Collaborative Masters Program in Agricultural and Applied Economics; 2010.
- Mkhawani K, Motadi SA, Mabapa NS, Mbhenyane XG, Blaauw R. Effects of rising food prices on household food security on female-headed households in Runnymede village, Mopani District, South Africa. *South Afr J Clin Nutr* 2016;29:69-74.
- Parfitt J, Barthel M, Macnaughton S. Food waste within food supply chains: Quantification and potential for change to 2050. *Philos Trans R Soc Lond B Biol Sci* 2010;365:3065-81.
- Chiripanhura BM, Nino-Zarazua M. The Impacts of Food, Fuel and Financial Crises on Nigeria: A Retrospective Approach for Research Enquiry. Draft for the CSAE Conference; 2013.
- Egwuma H, Ojeleye OA, Adeola SS. What determines food price inflation? Evidence from Nigeria. *FUOYE J Agric Human Ecol* 2017;1:48-61.
- Compton J, Wiggins S, Keats S. Impact of Global Food Crisis on The Poor: What is the Evidence? London: Overseas Development Institute; 2010.
- Christian P. Impact of the economic crisis and increase in food prices on child mortality: Exploring nutritional pathways. *J Nutr* 2010;140:177S-81S.
- Nwalie M. The paradox of food insecurity in Nigeria (2011-2017). *Afr J Agric Food Sec* 2017;5:202-8.
- Food and Agriculture Organization. Food Security and Nutrition Situation in Sahel and West Africa. Rome: Food and Agricultural

- Organization of the United Nations; 2017.
16. Nwankpa NN. Sustainable agricultural development in Nigeria: A way out of hunger and poverty. *Eur J Sustain Dev* 2017;6:175-84.
  17. El-Dukheri I, Elamin NH, Kherallah M. Impact of High Food Prices on Farmers in the Near East. Cairo: FAO, IFAD; 2012.
  18. Aina IV, Ayinde OE, Falola A. Effects of Price Variation on Rice Production in Nigeria (1970-2011). Proceedings of the International Conference of Agricultural Economics 2015, Università Degli Studi di Milano; 2015.
  19. Oyinbo O, Rekwot GZ. The relationships of inflationary trend, agricultural productivity and economic growth in Nigeria. *CBN J Appl Stat* 2014;5:35-48.
  20. Nwoko IC, Aye GC, Asogwa BC. Oil price and food price vitality dynamics: The case of Nigeria. *Cogent Food Agric* 2016;2:1-13.
  21. Ezike JO. Delineation of Old and New Enugu State. Enugu State Nigeria: Bulletin of the Ministry of Works and Survey; 1998.
  22. National Population Commission. Report of Nigerian's National Population Commission on the 2006 Census. *Popul Dev Rev* 2006;33:206-10.
  23. Akinyele IO. Ensuring Food and Nutrition Security in Rural Nigeria: An Assessment of the Challenges, Information Needs, and Analytical Capacity. New Delhi: International Food Policy Research Institute (IFPRI); 2009.
  24. Adeniyi OR, Ojo OA. Food security status of rural farming households in Iwo, Ayedire and Ayedaade local government areas of Osun State, South-Western Nigeria. *Afr J Food Agric Nutr Dev* 2013;13:8209-23.
  25. Molua EL. Climate variability, vulnerability and effectiveness of farm-level adaptation options: The challenges and implications for food security in Southwestern Cameroon. *Env Dev Econ* 2002;7:529-45.
  26. Alade A, Eniola PO. Gender contribution to rural household food security in South West, Nigeria. *Asian J Rural Dev* 2012;2:32-9.
  27. Zilberman D, Hochman G, Rajagopal D, Sexton S, Timilsima G. The impact of biofuels on commodity food prices: Assessment of findings. *Am J Agric Econ* 2013;95:275-81.
  28. Bouis HE. Micronutrient fortification of plants through plant breeding: Can it improve nutrition in man at low cost? *Proc Nutr Soc* 2003;62:403-11.
  29. Oluwatayo IB. Poverty and income diversification among households in rural Nigeria: A gender analysis of livelihood patterns. In: A Paper Presented at The 2<sup>nd</sup> Instituto de Estudos Sociais e Económicos (IESE) Conference on 'Dynamics of Poverty and Patterns of Economic Accumulation in Mozambique' in Maputo, Mozambique; 2009. p. 22-3.
  30. Igbalajobi O, Fatuase AI, Ajibefun I. Determinants of poverty incidence among rural farmers in Ondo State, Nigeria. *Am J Rural Dev* 2013;1:131-7.
  31. Gupta P, Singh K, Seth V, Agarwal S, Mathur P. Coping strategies adopted by households to prevent food insecurity in urban slums of Delhi, India. *J Food Secur* 2015;3:6-10.
  32. Kyaw D. Rural Household's Food Security Status and Coping: Strategies to Food Insecurity in Myanmar: Institute of Developing Economies, Japan External Trade Organization; 2009.
  33. Wilna HO, Emsie GD, Carin EN. Poverty, household food insecurity and nutrition: Coping strategies in an informal settlement in the Vaal Triangle, South Africa. *Public Health* 2006;120:795-804.