

EFFECT OF REMITTANCES ON FOOD SECURITY STATUS OF HOUSEHOLDS IN NIGERIA

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ABSTRACT

The study investigated the nexus between remittances and household food security status in Nigeria, using the 2018/2019 Nigeria Living Standard Measurement Survey–Integrated Survey on Agriculture (LSMS-ISA) dataset. Descriptive statistics, Food Consumption Score (FCS), Ordinary Least Squares regression, and Ordered Probit Regression were employed. Findings show that approximately 80% of households attained an acceptable FCS threshold, food security. Domestic cash remittances constituted the predominant inflow, received by 58% of households, while international cash and in-kind remittances accounted for 14.3% and 9.3%, respectively. Regionally, North Central households showed the highest food security (94.2%), while rural and urban food-secure households stood at 87% and 92.5%, respectively. Econometric estimates demonstrate that remittance inflow significantly improves household food security status across geopolitical zones. Key determinants of food security include domestic remittances, food transfer, household size, sex, age, marital status, and educational attainment. Policy implications underscore the need to promote domestic remittance channels, reduce transaction costs for international transfers, and strengthen logistics infrastructure. Furthermore, investment in both formal and informal education is critical, as human capital enhancement fosters greater household capacity to optimize remittance use and improve long-term food security outcomes., the government should seek to address the challenges of the high cost of international transactions and the poor logistics structure to improve access to international remittances. The government and policymakers should target education-friendly schools, as formal and informal education will increase the number of educated people in the country.

KEYWORDS: Food security; Remittance; Household Status; Food Consumption Score

INTRODUCTION

Access to food is guaranteed when individuals within a particular household have resources that are sufficient to acquire enough nutritious food. This could be through purchase, production, or as a gift (USAID, 1995). Food security is defined as "when all people, at all times, have physical and economic access to sufficient, safe and nutritious food to suit their dietary needs and food preferences for an active and healthy life", according to the Food and Agriculture Organization of the United Nations (FAO, 1996). This definition is applicable at all levels, from the individual level to global levels (Perez-Escamilla *et al.*, 2017).

In 2019, about 690 million people were malnourished globally, and in 2020, about 811 million people globally experienced the same threat of malnourishment (FAO, 2020). This report covered a total of 55 countries. Among these countries, 73 million people from 36 countries of the 55 countries are in Africa (Otekunrin *et al.*, 2019_{a, b}). Africa has one-third of the world's undernourished population of about 282 million in 2020, compared to 236 million in 2019 (FAO, 2020). Also, there are projections that the number of hungry people will increase to 841.4 million. This represents 9.8% of the global population, of which 433.2 million (51.5%) will come from Africa. This also represents the highest projected number reported for malnourished people on a global scale by 2030 (FAO, 2020). Approximately one in three people in sub-Saharan Africa is malnourished, according to forecasts from the African Food Security Briefs (AFSB) (Matemilola, 2017). Over 9 million people in Nigeria face food insecurity (FAO, 2020), and 12.6% of the population is undernourished. Nigeria is currently experiencing worrisome levels of food insecurity, necessitating an urgent and immediate response. According to the World Health Organization (2019), the absolute number of undernourished Nigerians in the country reached 9.1 million between 2004 and 2006. This figure grew by 25.6 million people, or 281.32 percent, between 2016 and 2018. The percentage of undernourished persons in Nigeria increased from 7.6 percent in 2012 to 12.6 percent in 2020.

In 2020, Nigeria ranked 98th out of 107 countries with a 29.2 score on the Global Hunger Index Severity Scale, which signifies that Nigeria's level of hunger is critical (Global Hunger Index, 2019). In addition, Nigeria had a relatively low rank and score on the Africa Sustainable Development Goals Index (SDGI). It was ranked 43rd out of 52 countries in Africa and received

a score of 47.03 out of 100. This placed it slightly behind Comoros and Sudan in Africa (Otekunrin *et al.*, 2019_c).

Remittance inflows into Nigeria were the sixth largest globally in 2017 and the biggest in Africa (World Bank, 2018). Remittance receipts have sustained a significant spot as a source of external financing to Nigeria. Its contribution to the country's GDP has increased progressively in the past decade; however, it fell to \$19.7 billion (4.9 percent of GDP) in 2016 from \$20.62 billion (5.02 percent of GDP) in 2011. It improved to \$22 billion (5.9 percent of GDP) in 2017. In 2018, it increased to \$24.3 billion, which represented 6.1 percent of GDP. In the subsequent year (2019), it fell to \$ 24 billion (5.3 percent of GDP) due to minor fluctuations recorded.

Internal and international remittances are the essential income source for many households in developing economies such as Nigeria (Mabrouk and Mekni, 2018). The vast majority of remittances are intended to improve the financial status of the households receiving the payments (Odior, 2014). According to the World Bank (2019), around one in every nine persons worldwide counts on migrant workers' money sent home as their primary source of income. Remittances improved housing, consumer durables, non-land assets, and overall spending (Quisumbing and McNiven, 2020). Remittance recipient households consume more food than non-recipients (Adams and Cuecuecha, 2010b). Remittances have an impact on food security in recipient countries by increasing capital outlay in the agricultural sector (Chiodi *et al.*, 2012; Jokisch, 2002). Quinn (2009) discovered that remittance-receiving households utilized remittances as insurance against output loss and agricultural failure. Remittances are used to boost consumption (Rosenzweig and Stark, 1989) and reduce poverty (Beegle *et al.*, 2011; Adams, 2006; Gupta *et al.*, 2009).

Current data on increased remittance inflows to Africa (including Nigeria) suggests that previous results and conclusions about the influence of remittances on food security may have evolved. Akerele *et al.* (2013) and Adeyonu *et al.* (2022) also found that it is important to support policies that would increase the members of a household's ability to earn money in the moment of food shortages. They noted that the three most popular coping methods for dealing with short-term food shortages were eating less costly food, eating food that is less preferred , and also reducing the size of one's portion.

In contrast, according to a report by Iheke (2016), remittance flows are grossly underestimated, with up to fifty percent of remittances entering the country through unofficial channels. There is a reasonably broad network of urban centers dispersed throughout all parts of the country, and the annual rate of urbanization exceeds 4 percent (CIA, 2018).

Various programs have also been introduced by the different governments of Nigeria to end food insecurity. The programs include: Green Revolution; Zero Hunger Initiative (ZHI); Directorate of Foods, Special Programme for Food Security (SPFS); FADAMA Development Project; National Home Grown School Feeding (NHGSF) program; Government Enterprise and Empowerment Program (GEEP); N-Power Program; Agricultural Development Program (ADP); National Special Program for Food Security (NSPFS); the National Cash Transfer Program (NCTP), and National Social Investment Programs (N-SIP) among others.

All of these schemes have performed poorly and have separately or collectively contributed to the observed low food production in Nigeria. There have been significant shifts in food and agricultural policies as a result of the frequent changes in government. These changes have caused significant delays and hindered the production and distribution of agricultural products. Every new government has abandoned the agricultural policies of the previous administration. This has led to widespread production instability and impeded efforts to eradicate food insecurity. Therefore, developing policies and interventions to enhance food security requires an understanding of transfers, their interrelationships, and their significance to specific populations (FAO, 2004).

The presence of chronic and furtive hunger, extreme poverty, corrupt government, frequently high food costs, violence/insurgency, community, farmers /herdsmen crisis, abduction, cattle rustling, violent conflict, and unfavorable climate change are the primary contributors to acute food insecurity that exists in a nation (**Obaniyi, *et al.* 2023**; FAO, 2020; FEWS NET, 2020). For years to come, a nation's capacity for economic progress will be impacted by this slowing of human development. Food insecurity is linked to several other general challenges of a country, namely; population growth, escalating energy demand, etc. (Behnassi, Pollmann, and Kissinger, 2013).

Although a lot of efforts have been invested in enhancing the world food supply, hunger remains pervasive in Nigeria (Matemilola and Elegbede, 2017). Before the Covid-19 outbreak, the world was already off the pace to meet the goal of ending world food insecurity and malnutrition by 2030. (UN, 2020). The COVID19 pandemic's effects on the supply chain, the rise of armed and inter-communal conflicts, certain localized cereal production deficits in 2020, rising food prices, and difficult macroeconomic conditions have made food insecurity more common. Furthermore, the growing frequency of food insecurity reflects the escalation of armed and societal conflicts (HLPE, 2020). The majority of the households who have been impacted are unable to carry out the activities that support their livelihoods, such as petty trade and unskilled work, which limits their ability to make purchases. In addition, the significantly above-average prices of staple foods make it grueling to purchase food. Many of the affected households continue to experience substantial levels of food insecurity making it very challenging to provide for the household's dietary needs (Ajiḃoye *et al.* 2017; FAO-GIEWS, 2019). Ending food insecurity, and enhancing/promoting nutrition and sustainable agriculture are some of the objectives of the second Sustainable Development Goal (SDG) because of the negative effects that food instability and hunger have on society (United Nations Environment Programme, 2015).

Although the number of foreign remittances to African nations has increased over time (Mabrouk and Mekni, 2018) and also the rate of migration within Nigeria has increased, nothing is known about the total quantity of internal remittances (Mohapatra and Ratha, 2011). The relationship between domestic and foreign remittances and household food security has remained elusive. Using descriptive statistics, this work attempts to estimate the share of remittances from within the country, and total remittances (outside the country) and examines the effect of remittances on the food security status of households in Nigeria across various zones and sectors using the ordered probit regression model.

Specifically, this study seeks to:

1. determine the food security status of the households in Nigeria by their spatial profile
2. identify the dominant source of remittances among households in Nigeria by their spatial profile
3. examine the effect of remittances on the food security status of households in Nigeria

METHODOLOGY

2.1 Study Area

Nigeria is located in West Africa, and is the most populous country of about 232 million people according to the United Nations World Population Prospects 2022 revision on the continent of Africa. Nigeria spans an area of approximately 923,768 square kilometers, encompassing diverse geographical features such as the Sahel region in the north, the Niger River basin, the tropical rainforest belt, and the coastal plains in the south. Nigeria exhibits a distinct urban-rural divide. Urban areas, including megacities like Lagos, Abuja, and Kano, experience rapid population growth, urbanization, and diverse economic opportunities. Rural areas, on the other hand, often face challenges related to limited infrastructure, access to services, and economic opportunities, with agriculture serving as the primary livelihood for many rural communities.

In northern Nigeria, particularly those affected by conflict and insecurity, experience higher levels of food insecurity, such as Borno, Adamawa, and Yobe. Remote and less developed rural areas across the country often face challenges in accessing nutritious food due to limited infrastructure, low agricultural productivity, and poverty. Agriculture is a primary livelihood in many northern states, with a focus on crops such as maize, millet, sorghum, and livestock rearing. States in the Middle Belt region, including Plateau, Benue, and Nasarawa, are known for their agricultural productivity and diversity. States like Lagos and Ogun, which have significant international migration flows, receive substantial remittances from Nigerians working abroad. Remittances are known to be concentrated in urban areas, where families of migrants benefit from financial support sent back home. Several states in northern Nigeria have higher poverty rates compared to southern states. States such as Sokoto, Kebbi, and Zamfara have particularly high poverty levels. Poverty is also more prevalent in rural areas, where access to basic services and economic opportunities is limited.

2.2 Data for the study

The data from the 2018/2019 Nigerian Living Standard Survey (NLSS) were employed in this study. The NLSS is a household-based survey that is being carried out by the National Bureau of

Statistics in conjunction with the World Bank. The information was gathered digitally with the assistance of Computer-Assisted Personal Interviewing (CAPI) devices, which made the process far more efficient, accurate, and devoid of mistakes (NBS). The sample consists of 22,110 households, with a variance from the initial sample attributable to security issues in the state of Borno and the resultant under coverage of the sample in that state. Consequently, Borno state was omitted during the data cleaning. Therefore, 21,699 households made up the final sample size for this study.

2.3 Data Analysis

Data was analyzed using descriptive statistics (arithmetic mean, percentages and frequencies) to capture the household's food security status categorized by (poor, borderline and acceptable) and to determine the dominant source of remittance among households. Also, the ordered probit regression was employed to analyze the factors influencing the food security status of households in Nigeria.

2.3.1 The food security status of the households in Nigeria

To classify the food security status of households by their spatial profile, the Food consumption score and the descriptive statistics (arithmetic mean, percentages, and frequencies) were used.

The Food Consumption Score (FCS) indicates the food security status of a household. Utilizing the FCS, the most food-insecure households were identified. The proportion of households with poor and borderline food consumption gives vital information on people's existing diets and aids in determining the most effective type and scale of food security intervention, as well as the best target group for support. FCS is particularly valuable for comparing households in different geographic locations and monitoring cyclical changes in nutrition. The food security level of the household is consequently categorized depending on its spatial profile as follows:

1. Using the data provided, the frequency of the household's consumption of eight different food groups during the past seven days was calculated.
2. The consumption frequencies were added together and multiplied by the standardized food group weight (the food groups and weights are listed in the table below). Hence, the scores for each of the weighted food groups were added together to produce the food consumption score (Table 1).

Table 1. Food groups and corresponding weights

Food groups	Weight(kg)
Oil	0.5
Sugar	0.5
Fruit	1
Vegetables	1
Main staples	2
Pulses	3
Milk	4
Meat/fish	4

Source: International Dietary Data Expansion Project (INDDEX, 2018)

3. Households were then classified as having "poor," "borderline," or "acceptable" food consumption level/category by applying the World Food Programme's recommended cut-offs to the food consumption score.
4. Therefore, the food security status of the household was determined based on the following thresholds:
 - Poor consumption level/category: 0-21
 - Borderline consumption level/category: 21.5-35
 - Acceptable consumption level/category: >35

The n sample observations will be labeled, $i = 1, \dots, n$, which is an observed ordered categorical variable for the Food Security Status indicator, i.e. the food consumption categories of households. It is assumed to be related to latent variable as follows; FSS categories is developed as 21 or below:

(FSS = 1); between 21.5 and 35 (FSS = 2); and above 35 (FSS = 3). The 1, 2, and 3 categories represent the poor, borderline, and acceptable food security status categories, respectively.

2.3.2 The Dominant source of remittances among households in Nigeria

The dominant source of remittances in Nigeria was estimated through descriptive statistics according to the 2018/2019 NLSS household data. The different sources of remittances were grouped according to the data and percentages for each of the groups were calculated. The source with the highest percentages was considered the dominant source based on the region and sector.

2.3.3 Effect of remittances on the food security status of households in Nigeria

The ordered probit regression was employed to analyze the effect of remittances on the food security status of households in Nigeria. This model was used to capture the marginal effect of each explanatory variable on each of the disaggregated food consumption categories. A generalization of the probit analysis using three categorical outcomes of an ordinal dependent variable is referred to as the ordered probit i.e. FCC (Food Consumption Categories) was utilized as an FSS (Food Security Status) indicator, which is the dependent variable. Categories 1 = Poor, 2 = Borderline, and 3 = Acceptable.

The maximum probability of the ordered probit regression model can then be specified as;

$$Y_i = X_i\beta + \varepsilon_i \quad (2)$$

Where Y_i is the exact but unobserved outcome variable, here, categories of response (Y_i) is observed in FSS_i , X_i is the vector of predictor variables, β is the vector of regression coefficients and ε_i is the error term.

The ordered probit method used the observations on FSS_i which are a form of censored data on;

FSS_i , to fit the parameter vector β

$$Y_i = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 + \beta_9 X_9 + \beta_{10} X_{10} + \beta_{11} X_{11} + \beta_{12} X_{12} + \beta_{13} X_{13} + \beta_{14} X_{14} + \beta_{15} X_{15} + \beta_{16} X_{16} + \beta_{17} + \varepsilon_i$$

(3)

Where:

X_1 = sector (Urban=1, 0 Rural)

X_2 = North East (1 if a household is in the northeast, 0 otherwise)

X_3 = North West dummy (1 if a household is in the northwest, 0 otherwise)

X_4 = South East (1 if a household is in the southwest, 0 otherwise)

X_5 = South-South (1 if a household is in the south-south, 0 otherwise)

X_6 = South West (1 if a household is in the southwest, 0 otherwise)

X_7 = Cash transfer received (dummy)

X_8 = Food transfer received (dummy)

X_9 = household income (in Naira)

X_{10} = International remittance (in Naira)

X_{11} = Domestic remittance (in Naira)

X_{12} = Households size (number)

X_{13} = Sex of the household head (Male =1, 0 Female)

X_{14} = Age of household head (in years)

X_{15} = Marital Status (1= married, 0= otherwise)

X_{16} = Educational level (1=formal education, 0= otherwise)

Y_i = Food Security Status (1 =Poor, 2 =Borderline, 3= Acceptable)

RESULTS AND DISCUSSION

3.1 The food security status of the households in Nigeria by their spatial profile

The study on the food security status of households across the zones and sector are shown in Table 2a and 2b respectively.

The result shows the food security status classified into poor, borderline, and acceptable across zones. All the measures show that over 80 percent of households in all the six geopolitical zones have acceptable food consumption scores, with the North Central, and Southeast have the highest

and least scores of 94.24 percent and 80.77 percent respectively. This shows that the households are secured on the premise of one of the three pillars of food security which is the utilization/consumption component. This supports the finding of Yusuf et al (2015) in Ofuoku (2018)), that many households in the Ibadan metropolis of Oyo State, Nigeria were food secure.

The analysis of food security status by sector presented in Table 1b shows that both the urban and rural sectors have food security status with an acceptable score of 92.53 and 87.02 percent respectively, however, the urban score is higher than that of the rural sector by 5.51 percent. This contradicts the finding of Akerele *et al*, (2013) who revealed that Food insecurity in Nigeria in the low-income urban and rural households, stands at 79% and 71%. However, it is in line with the finding of “Sahn and Stifel (2003), Ebadi, et al. (2018), and Thu and Booth (2014)” who reported that urban people were more food secured than Rural dwellers and they suggested that it could be as a result of urban-rural inequalities in several countries.

Table 2a Food Security Status by zones

	Northcentral		Northeast		Northwest	
FSS	Frequency	percent age	Frequency	percent age	Frequency	percentage
Poor	68	1.62	52	1.73	213	5.01
borderline	174	4.14	320	10.65	486	11.44
acceptable	3,963	94.24	2,634	87.62	3,549	83.55
Total	4,205	100.00	3,006	100.00	4,248	100.00
	Southeast		Southsouth		Southwest	
Poor	110	3.66	39	1.07	50	1.39
borderline	468	15.57	256	7.04	210	5.84
acceptable	2,4238	80.77	3,339	91.88	3,338	92.77

Total	3,006	100.00	3,634	100.00	3,598	100.00
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Source: Computed From NLSS Data, 2018/2019

Table 2b Food Security Status across sectors

	Urban		Rural	
Food				
consumption	Frequency	Percent	Frequency	Percent
score				
Poor	118	1.76	414	2.76
borderline	384	5.71	1,530	10.22
acceptable	6,221	92.53	13,030	87.02
Total	6,723	100.00	14,974	100.00

Source: Computed From NLSS Data, 2018/2019

3.2 Source of remittances

The dominant sources of remittance were identified, and the result is presented in Tables 3a and 3b. Evidence from Table 3a indicates that domestic cash remittance, both in the urban and rural sectors, has the highest percentages, which are 58.2 percent respectively. This implies that domestic cash remittances from rural households to urban households and from urban households to rural households are the same. This result is at variance with Ekong (2003), Dustmann, and Mesters (2010) who asserted that regular financial contributions are made back to the households left behind by migrants. On the other hand, Ofuoku (2015) discovered the converse, which is that more remittances were sent from rural families to the members of their households who had moved elsewhere.

The domestic in-kind remittances are higher in the rural sector (19.9 percent) than the receipt by urban dwellers (16.1 percent). In the same vein, in-kind international remittances domiciled in rural areas (13.4 percent) were higher than what is obtained in the urban sector (4.3 percent). On the other hand, international cash remittances were higher in the urban (21.4 percent) sector than in the rural sector (8.5 percent).

On the premise of the findings above, the dominant source of both cash and in-kind remittances is domestic remittances when compared to the international remittance source.

Table 2b showing the average remittances according to sources and geopolitical zone indicates that domestic cash remittance is the dominant source of remittance across all six zones. Mora-Rivera and Gamera (2021) opined that in food purchase and consumption, internal remittances are likely to be used as any other source of income, while international remittances are seen as transitory (unexpected) income and tend to be allocated to specific expenditures that relieve food insecurity. Other studies also show that the role of internal remittances in food security is less than the influence of international remittances (Lim and Basnet, 2017; Adams, 1998; Friedman, 1957)

Nigeria has almost half the population living below the poverty line (\$2 per day) (World Bank, 2018) which implies that the majority of households are poor and most international migrant households are households with a high living standard. Therefore, this could be the reason why domestic remittance is more dominant than international remittance. Also, high remittance costs, lack of knowledge on how to remit money through formal financial institutions, related difficulties in moving in kind stuff across international boundaries, and customs duties could be a factor.

Table 3a Average remittances according to their sources by sector

	Rural		Urban		National	
Variable	Amount	%	Amount	%	Amount	%
Domestic Cash remittances	10810.39	58.2	20256.35	58.2	13738.8	58.2
Domestic In-kind remittances	3702.437	19.9	5602.563	16.1	4291.51	18.2
International Cash remittances	1580.124	8.5	7443.175	21.4	3397.772	14.3
International In-kind remittances	2494.202	13.4	1499.321	4.3	2185.771	9.3
Total	18,587.153	100.00	34,801.409	100.00	23,613.853	100.00

Source: Computed From NLSS Data, 2018/2019

3b Average remittances according to their sources by zone

	Northcentral		North East		Northwest	
Variables	Amount	%	Amount	%	Amount	%
Domestic Cash remittances	12567.19	73.52	3059.621	60.2	7429.907	47.2
Domestic Inkind remittances	2931.937	17.15	1962.379	38.6	3955.968	25.1
International Cash remittances	1447.321	8.47	36.64382	0.72	747.6011	4.8
International Inkind remittances	147.8923	0.86	24.17204	0.48	3598.089	22.9
Total	17,094.3403	100.00	5,082.81586	100.00	15,731.5651	100.00
	Southeast		South-south		Southwest	
Domestic Cash remittances	12608.45	54.1	22052.22	53.2	24015.43	62.7
Domestic Inkind remittances	4164.921	17.9	6752.392	16.30	5841.423	15.3
International Cash remittances	4523.729	19.4	7244.458	17.5	6785.223	17.7
International Inkind remittances	2003.176	8.6	5375.675	13.0	1637.835	4.3
Total	23,300.276	100.00	41,424.745	100.00	38,279.911	100.00

Source: Computed From NLSS Data, 2018/2019

3.3 Food security status of households in Nigeria

To elucidate the influence of remittances on the three categories of food security status of families in Nigeria and by their spatial characteristics, the effects of remittances on the food security of households are broken down (rural and urban sectors).

The marginal effects of the three categories of food security status in Table 4 show that nationally, the sector has a negative and significant impact on the poor and borderline categories respectively, and a positive and significant impact on the acceptable category. This explains that urban households are 0.4 percent less likely to be poor, 1.2 percent less likely to be borderline, and 1.6 percent more likely to be in the acceptable category of food security status when compared to rural households.

Based on the national data, the northeast shows a significant and positive influence on the poor and borderline category and a negative and significant influence on the acceptance of food security status. This signifies that households in the northeast are 1.5 percent more likely to be poor, and 4 percent more likely to be on the borderline of food insecurity than households in the north-central region. This result agrees with that of the rural sector. There is no significant relationship between the urban sectors of this region and food security status.

The Northwest and the southeast region have a positive and significant influence on the poor and borderline categories respectively. While a negative and significant influence was seen in the acceptable category. This means that households are more likely to be in the low or borderline food security group and less likely to be in the acceptable category. This finding is comparable to what is obtained in these areas' rural and urban sectors, the south-south region, and the rural sectors of the south-south region compared to the Northern region. The urban sectors in the southwest area have a positive and significant impact on the poor and borderline population. In the acceptable category, there was a negative and significant impact. This result is the same for the southwest region nationally. The result reveals that households in this region are more likely to be in a poor and borderline category and less likely to be in the acceptable category compared with the north-central region. These results could be because the northern region has majorities who have farming as their occupation and the food basket of the nation is in this region.

Sex has a significantly positive impact on the poor and borderline categories, respectively, and a negative and significant impact on the acceptable category across sectors and the nation. This indicates that a male household head is 1% more likely to be in the poor group, 3.7 percent more likely to be in the borderline category, and 4% less likely to be in the acceptable category of food security status as compared to a female-headed household. This could be due to higher family responsibilities the male household head has to bear even outside his nuclear family in line with

African culture. On the other hand, their female counterparts are more concerned about the nutrition and the availability of food for members of their nuclear family. This data also implies that the share of income allocated to food consumption is higher in female-headed families, which is consistent with previous findings (Azzarri and Zezza, 2011; Thow et al., 2016).

Income, household size, domestic remittances, and educational attainment all have a negative and severe impact on the poor and borderline population. This finding suggests that a unit rise in these factors will make them less likely to be classified in the poor or borderline group. These variables also have a positive and significant impact on the acceptable category across the nation and sectors. This reveals that a unit increase in these variables will put the households in the acceptable category of food security status. Specifically, a unit increase in domestic remittance is associated with being 0.00085% less likely in the poor category, 0.027% less likely in the borderline category, and 0.035% more likely to be in an acceptable category of food security status. According to Quartey and Blankson (2004), Generoso (2015), Quartey (2006), Regmi and Paudel (2016 and 2017), and Atuoye et al. (2017), remittances boost the welfare and degree of food security in households who receive them. Remittances are also found to help households in low-income economies [Obi et al. (2020); FAO (2014); Banga and Sahu (2010); and Williams et al. (2013)].

An increase in domestic remittances is attributed to being 0.00007 percent less likely to be in the poor category, 0.000021 percent less likely to be in the borderline category, and 0.000028 percent more likely to be in the acceptable category of food security status in the urban sector. When compared to the rural sector, the rural sector has a greater number of people in the poor, borderline, and acceptable food security categories. According to related studies, remittances disproportionately affect rural and low-income earners in developing nations (Adams and Page 2005; Thieme and Wyss 2005; Frost et al. 2007; Yang 2011; Carletto et al. 2011).

A unit increase in a household head's educational level is related to being 0.9 percent less likely to be in the poor category, 2% less likely to be in the borderline category, and 3% more likely to be in the acceptable category of food security status. Rural families' educational level has a negative and strong association with the poor and borderline category. This implies that a unit increase in the education level of the household heads is associated with a 0.9 percent and 2.8 percent decreased likelihood of dropping into the poor and borderline categories, respectively.

The level of education result in the acceptable category is consistent with this relationship because it is discovered to have a favorable and significant impact. This shows that the likelihood of the household falling into the acceptable category increases by 3.7 percent for every unit increase in education level.

Being married leads to being 2.4 percent less likely to be poor, 6.51 percent less likely to be borderline, and 8.94 percent more likely to be acceptable. This finding suggests that married households benefit from pooled income more than unmarried households, increasing the likelihood of the household being food secure.

Table 4 Marginal Effect of Remittance on Food Security Status of Households in Nigeria by Categories

Variables	National			Rural			Urban		
	Poor	Borderline	Acceptable	Poor	Borderline	Acceptable	Poor	Borderline	Acceptable
Sector	-0.004 (-3.63)***	-0.01279 (-3.59)***	0.016781 (3.61)***	-	-	-	-	-	-
North East	0.015989 (5.63)***	0.04373 (6.41)***	-0.05972 (-6.24)***	0.016705 (5.15)***	0.047026 (5.79)***	-0.06373 (-5.66)***	0.006628 (1.17)	0.018453 (1.28)	-0.02508 (-1.25)
North West	0.036454 (10.09)***	0.088783 (13.19)***	-0.12524 (12.51)***	0.038503 (9.12)***	0.096454 (11.8)***	-0.13496 (-11.27)***	0.025896 (4.12)***	0.061661 (5.27)***	-0.08756 (-4.99)***
South East	0.035741 (9.09)***	0.085363 (11.41)***	-0.1211 (10.88)***	0.04172 (8.31)***	0.099322 (10.59)***	-0.14104 (-10.07)***	0.016157 (3.33)***	0.041333 (3.77)***	-0.05749 (-3.68)***
South South	0.00424 (1.99)**	0.012825 (2.04)**	-0.01706 (-2.03)**	0.010324 (3.3)***	0.030413 (3.48)***	-0.04074 (-3.44)***	-0.00389 (-1.74)*	-0.01241 (-1.7)*	0.016303 (1.71)*
South West	0.006222 (2.64)***	0.018504 (2.75)***	-0.02473 (-2.73)***	-0.00311 (-1.04)	-0.01029 (-1.01)	0.013406 (1.01)	0.004964 (2.12)**	0.014725 (2.16)**	-0.01969 (-2.16)**
Income	-3.7E-05 (-6.04)***	-0.00012 (-5.77)***	0.000154 (5.88)***	-7.8E-05 (-8.93)***	-0.00025 (-8.12)***	0.000328 (8.48)***	-9.91E-06 (-2.08)**	-3E-05 (-2.04)**	0.00004 (2.06)**
International remittance	1.08E-06 (0.41)	3.39E-06 (0.42)	-4.47E-06 (-0.42)	1.23E-06 (0.41)	3.94E-06 (0.41)	-5.17E-06 (-0.41)	-1.73E-06 (-0.11)	-5.27E-06 (-0.11)	7.00E-06 (0.11)
Cash transfer	-0.00267 (-0.82)	-0.0087 (-0.79)	0.011371 (0.79)	0.003383 (0.62)	0.010385 (0.64)	-0.01377 (0.64)	-0.00838 (-3.79)***	-0.03045 (-3.15)***	0.038831 (3.31)***
food transfer	-0.00402 (-3.11)***	-0.01317 (-3.01)***	0.017186 (3.04)***	-0.00596 (-4.02)***	-0.02021 (-3.89)***	0.026173 (3.94)***	0.002741 (0.82)	0.008028 (0.85)	-0.01077 (-0.84)
Domestic remittance	-8.5E-05 (-3.98)***	-0.00027 (-3.93)***	0.000353 (3.96)***	-7.2E-05 (-2.28)**	-0.00023 (-2.28)**	0.0003 (2.28)**	-7E-05 (-3.21)***	-0.00021 (-3.13)***	0.000282 (3.19)***
hhsz	-0.0029 (-12.33)***	-0.00911 (13.15)***	0.012014 (13.48)***	-0.00336 (-11.66)***	-0.01072 (-12.7)***	0.014082 (13.07)***	-0.00266 (-6.07)***	-0.00808 (-6.12)***	0.010744 (6.37)***

sex	0.010861 (8.31)***	0.03752 (8.09)***	-0.04838 (-8.27)***	0.011983 (7.22)***	0.042663 (6.9)***	-0.05465 (-7.08)***	0.008027 (4.5)***	0.026249 (4.69)***	-0.03428 (-4.76)***
age	-5.8E-05 (-1.72)*	-0.00018 (-1.73)*	0.000239 (1.73)*	2.61E-06 (0.06)	8.32E-06 (0.06)	-1.1E-05 (-0.06)	-0.00015 (-2.8)***	-0.00044 (-2.88)***	0.000589 (2.88)***
maritalstatus	-0.02431 (-8.04)***	-0.06516 (-9.72)***	0.089474 (9.38)***	-0.02505 (-6.53)***	-0.06807 (-7.8)***	0.093122 (7.53)***	-0.01987 (-4.57)***	-0.05226 (-5.82)***	0.07213 (5.58)***
Edulevel	-0.00975 (-7.37)***	-0.02945 (-8.13)***	0.039201 (8.04)***	-0.00908 (-6.08)***	-0.0285 (-6.61)***	0.03758 (6.56)***	-0.00814 (-3.16)***	-0.02292 (-3.46)***	0.03105 (3.42)***

***= Significant at 1% level; **= Significant at 5% level; *=Significant at 10% level; values in parenthesis represents z-value.

Source: Computed from NLSS Data, 2018/2019

4.0 CONCLUSION/RECOMMENDATION

The study revealed that more than 80% of households across all six geopolitical zones in Nigeria were in an acceptable level of food security. The North Central and Southeast regions had the highest and lowest scores, respectively, indicating variations in food security across different regions. Most households in Nigeria are in an acceptable level of food security, but regional disparities exist. This suggests that targeted interventions should be implemented in regions with lower food security scores to address specific challenges. Targeted food security interventions should be Implemented in regions with lower food security scores to improve the overall food security status of households in Nigeria.

Domestic remittances were found to be the dominant source of both cash and in-kind remittances in Nigeria, surpassing international remittances. Factors such as high remittance costs and difficulties in moving in-kind items across international boundaries contributed to the prominence of domestic remittances. Domestic remittances play a significant role in supporting households in Nigeria, and addressing barriers to international remittances could further enhance their impact on household welfare.

Incentives for formal remittance channels and reducing the costs associated with transfers should be encouraged and facilitated. Additionally, efforts should be made by the government to improve financial literacy, particularly in rural areas, to educate households on the benefits of using formal financial institutions for remittances.

Also, the study revealed that income, domestic remittances, household size, and level of education had positive and significant relationships with food security status. Urban households were more likely to be in the acceptable category of food security compared to rural households. Remittances, particularly domestic remittances, have a positive impact on household food security status. Higher income, domestic remittances, smaller household size, and higher education levels are associated with improved food security outcomes.

The flow of remittances and policy exploration that enhance domestic remittances as they positively contribute to food security should be encouraged by stakeholders and the government. Additionally, investments in education and skills development programs can help improve

household incomes and contribute to better food security outcomes. Efforts should also be made to target interventions in regions with higher levels of food insecurity, especially in rural areas, to address specific challenges and improve overall food security.

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