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ANALYSIS OF DISPLACED HOUSEHOLD FOOD SECURITY DATA IN DAMATURU, NIGERIA

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Abstract

Food security assessments among internally displaced persons in Nigeria typically rely on item mean scores against a criterion of 3.00, a practice that can obscure response distributions, indecision, and polarized viewpoints. This study investigated food security and nutrition among sixty households of displaced school children aged 6 to 12 years in Kuka Reta camp, Damaturu, Yobe State, analyzing response distributions, item consistency, and observed household conditions. Data were collected using a 36-item questionnaire and a 13-item observation checklist, examining response percentages, strongly worded opinions, divided items, and the minimum overlap between related indicators. Although all dimension means fell below 3.00, items reaching the criterion lacked majority agreement due to high indecision, and about one-third of respondents reported reliable access while most reported none. Questionnaire and checklist observations revealed severe shortages of protein, fruits, vegetables, safe storage facilities, and emergency food reserves. Humanitarian surveys of displaced populations should report full response distributions alongside means, incorporate specific time frames for food sufficiency questions, and prioritize improving the regularity of food assistance and household-level storage support.

Keywords: food security; internally displaced persons; school children; Likert scale; observation checklist; Yobe State

Introduction

The insurgency in North-East Nigeria has displaced more than two million people, and the International Organization for Migration (IOM, 2023) counted 2,295,534 internally displaced persons in six north-eastern states in June 2023, 40 per cent of whom lived in camps and camp-like settings. Families in these camps have lost land, livestock and income, and most rely on humanitarian assistance, which the Famine Early Warning Systems Network (FEWS NET, 2023) reported covered only about 70 per cent of monthly energy needs. Children of primary school age carry these losses through their households, but they are seldom studied as a group, and Gooding et al. (2024) noted that research on older displaced children in Africa is lacking. Recent studies in the region have measured food security mainly at household level, for example through dietary diversity scores (Mshelia, Ilesanmi, Alimba, & Awodoyin, 2025; Oyekale, 2026) or the Household Food Insecurity Access Scale (Keswet & Ibrahim, 2025).

Many studies of displaced persons in Nigeria, including theses in education and home economics, use Likert-type questionnaires and report the mean of each item against a criterion of 3.00, the midpoint of a five-point scale. An item is then described as agreed or disagreed according to its mean alone. This practice is simple, but a mean near the midpoint can arise from broad agreement, from many undecided answers, or from a sample split

between the two ends of the scale. These situations call for different responses from programmes, so a report that gives only the mean may lead to the wrong one.

This paper reports results of a study of food security and nutrition among households of displaced school children aged 6 to 12 years in North-East Nigeria. The results come from 60 households in Kuka Reta camp, Damaturu, Yobe State, drawn from the population of the study and sharing its characteristics, and were obtained with a 36-item questionnaire and a 13-item observation checklist. The study examines six dimensions, namely food availability, accessibility, utilisation, stability, dietary diversity and food frequency. Besides the item and dimension means, the paper examines how the responses behind each mean were distributed and how answers to related items fitted together.

The paper asks three questions. First, how low were the dimension means, and how far did indecision and strongly worded responses shape the item means? Second, on which items were respondents divided, and do related items give consistent answers when examined together? Third, what conditions did observers find in the households, and how do they compare with caregivers' reports?

Methods

Data and setting

The data were collected in June 2026 in Kuka Reta Internally Displaced Persons Camp, Damaturu Local Government Area, Yobe State, one of the camps of displaced persons in the area of the study. Sixty households with displaced school children aged 6 to 12 years were selected purposively on the basis of their willingness and availability, and the parent or caregiver of the child in each household answered the questionnaire. The same 60 households were rated with the observation checklist during the same visit. Participants were told the purpose of the study, assured of confidentiality and informed of their right to withdraw, and no names or other identifying details were recorded.

Instruments

The Food Security and Nutrition Questionnaire contained 36 statements, six for each of the six dimensions, rated as Strongly Agree (5), Agree (4), Undecided (3), Disagree (2) and Strongly Disagree (1). Two statements were worded negatively: "Security challenges interrupt our household food supply" (item 23) and "Children go to bed hungry because there is not enough food in the household" (item 36). The observation checklist contained 13 items, five on food availability and eight on food stability, each rated as Available (2) or Not Available (1) on the basis of what the observer saw in the household. An item was rated Available only when it was fully present, and an item present only in part was counted as Not Available. Cronbach's alpha for the sections of the two instruments ranged from 0.78 to 0.86, and two observers who rated the same households independently agreed on 88 per cent of checklist ratings.

Analysis

All analyses used the response frequencies of each item. Every percentage reported here uses the 60 households as its denominator. First, the share of Undecided, Strongly Agree and Strongly Disagree responses was computed for each item and each dimension, and the items whose means reached the criterion of 3.00 were compared with the share of respondents who actually agreed with them. Second, an item was classed as divided when

at least 25 per cent of respondents agreed and at least 40 per cent disagreed, and the share of responses at the two ends of the scale was reported for these items.

Third, related items were examined together. Because only item frequencies were available, the number of respondents who gave a particular pair of answers could not be counted directly, but its minimum can be computed. If a respondents give one answer to the first item and b respondents give a stated answer to the second, at least a + b − n of the n respondents must have given both answers, where this quantity is positive. This minimum was computed for pairs of items that describe the same situation from different angles, such as having enough food and having food that lasts until the next distribution.

Fourth, questionnaire items were matched with checklist items that refer to the same condition, such as safe storage, food stocks, food aid and protein foods, and the share of caregivers who agreed was compared with the share of households observed to have the condition. For the checklist, the percentage of households in which each item was available, the item mean and the section means were computed, with a criterion mean of 1.50, the midpoint of the two-point scale, so that an item with a mean of 1.50 or above was available in at least half of the households. Ninety-five per cent confidence intervals for proportions were computed with the Wilson score method (Wilson, 1927), whose limits stay within 0 and 100 per cent even when a proportion is close to either end. All calculations were checked by recomputing them from the frequencies in a separate script.

Results

Dimension means

All six dimension means fell below the criterion of 3.00 (Table 1). Food utilisation had the lowest mean (2.12), followed by food availability (2.18), food accessibility (2.22), food frequency (2.25), food stability (2.30) and dietary diversity (2.37). Only five of the 34 positively worded items reached the criterion, and both negatively worded items did, which indicates agreement with statements describing insecurity and hunger. On the checklist, the section means were 1.21 for availability and 1.27 for stability, both below the criterion of 1.50. By the usual reading of mean scores, food security in the camp was therefore low on every dimension.

Table 1. Questionnaire dimension means (n = 60)

Dimension	Mean	Decision	Positively worded items at or above 3.00
Food availability	2.18	Low	1, 6
Food accessibility	2.22	Low	None
Food utilization	2.12	Low	15
Food stability	2.30	Low	None (item 23 agreed)
Dietary diversity	2.37	Low	29, 30
Food frequency	2.25	Low	None (item 36 agreed)

Source: Field Data 2026

Indecision and strength of response

Of the 2,160 questionnaire responses, 15.5 per cent were Undecided. Indecision was lowest for accessibility (11.7 per cent) and availability (12.5 per cent) and highest for stability (17.8 per cent) and dietary diversity (18.1 per cent), as shown in Table 2. Strongly

Disagree responses followed the opposite pattern: they made up 43.1 per cent of the responses on availability, mainly because 80.0 per cent of respondents strongly disagreed that the household had access to land and 83.3 per cent strongly disagreed that they could find the foods they preferred, but only 24.2 per cent of the responses on food frequency. Respondents therefore expressed their strongest disagreement about the loss of land and food choice, and more moderate disagreement about their children's meals.

Table 2. Undecided and strongly worded responses by dimension (per cent of responses)

Dimension	Undecided	Strongly agree	Strongly disagree
Availability	12.5	6.1	43.1
Accessibility	11.7	8.1	33.3
Utilisation	15.8	5.0	38.3
Stability	17.8	6.4	30.3
Dietary diversity	18.1	6.4	29.2
Food frequency	16.9	4.7	24.2
All items	**15.5**	**6.1**	**33.1**

Source: Field Data 2026

Seven items had means at or above the criterion of 3.00, but none of them was agreed with by a majority of respondents (Table 3). The share agreeing ranged from 40.0 per cent, for having enough food and for knowing how to prepare nutritious meals, to 48.3 per cent, for insecurity interrupting the food supply and for the diet changing with the foods available. These means reached the criterion because many respondents were undecided: 36.7 per cent were undecided on whether the household always had enough food (95% CI 25.6 to 49.3), and 28.3 per cent on whether their children went to bed hungry (95% CI 18.5 to 40.8). The two items with the highest indecision were therefore the two that asked most directly about hunger and sufficiency.

Table 3. Items with means at or above the criterion of 3.00

Item	Statement	Mean	Agree, % (95% CI)	Undecided, %	Disagree, %
1	My household always has enough food to eat	3.15	40.0 (28.6–52.6)	36.7	23.3
6	We receive sufficient food aid to meet our needs	3.07	45.0 (33.1–57.5)	13.3	41.7
15	My household members know how to prepare nutritious meals	3.08	40.0 (28.6–52.6)	26.7	33.3
23	Security challenges interrupt our household food supply	3.08	48.3 (36.2–60.7)	20.0	31.7
29	Children in my household eat fortified foods	3.08	43.3 (31.6–55.9)	26.7	30.0
30	Our diet changes based on the availability of different food types	3.30	48.3 (36.2–60.7)	26.7	25.0

36	Children go to bed hungry because there is not enough food in the household	3.18	45.0 (33.1–57.5)	28.3	26.7

Source: Field Data 2026

Divided responses

Four items met the definition of a divided item, and all four concerned the supply of food or the means to obtain it (Table 4). The clearest case was the statement that the household could obtain food whenever it was needed: 33.3 per cent agreed and 58.3 per cent disagreed, and 60.0 per cent of all answers were at one of the two ends of the scale, 14 respondents strongly agreeing and 22 strongly disagreeing. Similar splits appeared for consistent food supplies (35.0 per cent agreeing, 51.7 per cent disagreeing), sufficient food aid (45.0 and 41.7 per cent) and affording food when aid was insufficient (28.3 and 61.7 per cent). On these items, a minority of roughly one household in three reported reliable access to food, while most reported none, and the item means placed both groups in a single category.

Table 4. Divided items (at least 25 per cent agreeing and at least 40 per cent disagreeing)

Item	Statement	Agree, %	Disagree, %	At either end, %
4	Food supplies are consistent and do not run out unexpectedly	35.0	51.7	45.0
6	We receive sufficient food aid to meet our needs	45.0	41.7	13.3
7	My household can obtain food whenever it is needed	33.3	58.3	60.0
10	My household can afford to purchase food when humanitarian supplies are insufficient	28.3	61.7	38.3

Source: Field Data 2026

Consistency across related items

Table 5 gives the minimum number of respondents who must have given each pair of answers. Of the 24 respondents who agreed that their household always had enough food, at least 18 (30.0 per cent of all respondents) did not agree that the food available lasted until the next distribution, at least 15 (25.0 per cent) did not agree that their children usually ate three meals a day, and at least 8 (13.3 per cent) agreed or were undecided that their children went to bed hungry. These answers can be reconciled only if "enough food" referred to the food in the household at the time of the interview rather than to food throughout the month. The same pattern appeared for food aid: at least 22 respondents (36.7 per cent) said that the aid they received was sufficient but did not agree that it arrived regularly.

Two further pairs concern the quality and use of food. At least 17 respondents (28.3 per cent) agreed that their children ate fortified foods but did not agree that the children ate a variety of foods daily, so fortified foods appeared within diets that were otherwise

narrow. At least 15 respondents (25.0 per cent) agreed that their household knew how to prepare nutritious meals but did not agree that they had clean water for cooking. Only 15.0 per cent of all respondents agreed that their children ate a variety of foods daily, and the same share agreed that they had clean water for cooking.

Table 5. Minimum number of respondents giving both answers to pairs of related items

First answer	Second answer	Minimum, n (%)
Item 1, agreed (n = 24): My household always has enough food to eat	Item 36, agreed or undecided (n = 44): Children go to bed hungry because there is not enough food in the household	8 (13.3)
Item 1, agreed (n = 24): My household always has enough food to eat	Item 22, did not agree (n = 54): The food available is sufficient until the next distribution period	18 (30.0)
Item 1, agreed (n = 24): My household always has enough food to eat	Item 31, did not agree (n = 51): School-aged children usually eat three meals each day	15 (25.0)
Item 1, agreed (n = 24): My household always has enough food to eat	Item 19, did not agree (n = 49): Food is available in my household throughout the month	13 (21.7)
Item 6, agreed (n = 27): We receive sufficient food aid to meet our needs	Item 20, did not agree (n = 55): Food assistance is received regularly without long interruptions	22 (36.7)
Item 29, agreed (n = 26): Children in my household eat fortified foods	Item 25, did not agree (n = 51): Children in my household eat a variety of foods daily	17 (28.3)
Item 15, agreed (n = 24): My household members know how to prepare nutritious meals	Item 13, did not agree (n = 51): My household has access to clean water for cooking	15 (25.0)

Source: Field Data 2026

Reported and observed conditions

Caregivers' reports and observers' ratings agreed closely on diets (Table 6). Only 11.7 per cent of caregivers agreed that their meals included protein foods, and observers found protein foods available in 10.0 per cent of households; 5.0 per cent of caregivers agreed that they ate vegetables regularly, and observers found fruits and vegetables available in 3.3 per cent. Staple foods, on which the diets depended, were available in only 18.3 per cent of households (95% CI 10.6 to 29.9). The two sources differed on storage, where only 8.3 per cent of caregivers agreed that they had adequate facilities to store food safely, while observers found storage facilities present in 36.7 per cent of households and functional storage in 20.0 per cent.

On food stocks, the two sources described different time horizons. Observers found stored food sufficient for immediate use in 40.0 per cent of households but emergency reserves in only 15.0 per cent, and 10.0 per cent of caregivers agreed that their food lasted

until the next distribution. The households thus had food for the present more often than food for the coming weeks, which matches the pattern of answers in Section 3.4. Food aid was reported as sufficient by 45.0 per cent of caregivers and observed to be available in 36.7 per cent of households, a closer match than on storage.

Table 6. Caregivers' reports compared with observed conditions in the same households

Condition	Questionnaire, % agreeing	Checklist item	Available, % of households (95% CI)
Safe storage	Item 14: 8.3	Food storage facilities present	36.7 (25.6–49.3)
		Functional food storage facilities are available	20.0 (11.8–31.8)
Protection of stored food	Item 14: 8.3	Food storage area is protected from pests, moisture, and contamination	23.3 (14.4–35.4)
Food stocks	Item 22: 10.0	Household has stored food sufficient for immediate use	40.0 (28.6–52.6)
		Household has emergency food reserves for periods of scarcity	15.0 (8.1–26.1)
Food aid	Item 6: 45.0	Food aid supplies or vouchers currently available in the household	36.7 (25.6–49.3)
Protein foods	Item 27: 11.7	Protein foods available	10.0 (4.7–20.1)
Fruits and vegetables	Item 26: 5.0	Fruits and vegetables available	3.3 (0.9–11.4)

Source: Field Data 2026

Observed availability and stability of food

No checklist item reached the criterion of 1.50, so no item was available in half of the households (Table 7). On availability, the item most often observed was food storage facilities (36.7 per cent, mean 1.37), followed by evidence of food preparation (35.0 per cent), while staple foods were available in 18.3 per cent of households, protein foods in 10.0 per cent and fruits and vegetables in 3.3 per cent. On stability, stored food sufficient for immediate use was found in 40.0 per cent of households and food aid supplies or vouchers in 36.7 per cent, but emergency food reserves were found in only 15.0 per cent (95% CI 8.1 to 26.1). More than one type of staple food in storage was found in 21.7 per cent of households, functional storage facilities in 20.0 per cent and storage protected from pests, moisture and contamination in 23.3 per cent. The observations therefore describe households with little food beyond what was needed for the present, with almost no protein foods, fruits or vegetables.

Table 7. Observation checklist results (n = 60 households)

Item	Not available, %	Available, % (95% CI)	Mean	SD	Remark
Food availability					
Staple foods present	81.7	18.3 (10.6–29.9)	1.18	0.39	Not available
Protein foods available	90.0	10.0 (4.7–20.1)	1.10	0.30	Not available
Fruits and vegetables available	96.7	3.3 (0.9–11.4)	1.03	0.18	Not available
Food storage facilities present	63.3	36.7 (25.6–49.3)	1.37	0.49	Not available
Evidence of food preparation	65.0	35.0 (24.2–47.6)	1.35	0.48	Not available
Section mean			**1.21**		**Inadequate**
Food stability					
Household has stored food sufficient for immediate use	60.0	40.0 (28.6–52.6)	1.40	0.49	Not available
Functional food storage facilities are available	80.0	20.0 (11.8–31.8)	1.20	0.40	Not available
Food items observed show minimal signs of spoilage or deterioration	68.3	31.7 (21.3–44.2)	1.32	0.47	Not available
Evidence of food preservation methods	71.7	28.3 (18.5–40.8)	1.28	0.45	Not available
Food aid supplies or vouchers currently available in the household	63.3	36.7 (25.6–49.3)	1.37	0.49	Not available
Household possesses more than one type of staple food in storage	78.3	21.7 (13.1–33.6)	1.22	0.42	Not available
Household has emergency food reserves for periods of scarcity	85.0	15.0 (8.1–26.1)	1.15	0.36	Not available
Food storage area is protected from pests, moisture, and contamination	76.7	23.3 (14.4–35.4)	1.23	0.43	Not available
Section mean			**1.27**		**Inadequate**

Source: Field Data 2026

DISCUSSION

The analysis shows that the dimension and item means, although correct, hid three features of the data. First, every item that reached the criterion did so with a minority agreeing and a large share undecided, so the description of these items as agreed

overstates the respondents' position. Second, a minority of about one household in three reported reliable access to food on items where most reported none. Third, related answers showed that caregivers judged food sufficiency by the food at hand rather than over the month. None of these features changes the overall finding of low food security, but each changes what the data imply for programmes and for the rest of the study.

The concentration of indecision on the items about having enough food and children going to bed hungry deserves attention. These are the items that ask most directly about hunger, and they are also the items whose wording is most open to different time frames, since "always" and "go to bed hungry" can refer to the day of the interview or to the month as a whole. Respondents may also have been reluctant to give answers that seemed to criticise the assistance they depended on, although the data cannot distinguish between these explanations. The minimum-overlap results support the first explanation, since at least 30.0 per cent of respondents said that the household always had enough food while not agreeing that it lasted until the next distribution. This suggests that respondents judged sufficiency by the food at hand, and it shows that a single question about having enough food is not a reliable measure in this setting.

The divided items point to differences between households in the same camp. About a third of respondents reported that they could obtain food when needed and could afford food when aid fell short, which suggests that some households had income or other support that most lacked. Oyekale (2026) found, in five conflict-affected northern states, that recipients of food assistance had higher food insecurity, which is consistent with assistance being directed to the poorest households, and Alli and Yusuf (2026) found that food distribution in camps in Borno State improved the well-being of displaced persons. In a camp where aid reaches most households but some also have other sources of food, a mean conceals the group with no other source, which is the group that targeting should reach. The full study can examine this by reporting the distribution of responses and by adding a question on income and other support to Section A of the questionnaire, which at present records household size but not income.

The answers on food aid locate the problem in the regularity of supply rather than the size of rations. At least 36.7 per cent of respondents found the aid sufficient but not regular, and only 8.3 per cent agreed that assistance arrived without long interruptions. This agrees with the report of FEWS NET (2023) that funding shortfalls threatened the continuity of assistance and with the conclusion of Badewa and Dinbabo (2023) that interventions in the North-East were fragmented. For displaced school children, irregular supply means that the days without food come at the end of each distribution cycle, a pattern that household means for the month cannot show.

The agreement between caregivers and observers on diets strengthens the finding that protein foods, fruits and vegetables were largely absent, and it matches the fall in dietary diversity reported for insurgency-affected areas of Adamawa State (Mshelia et al., 2025) and the high food insecurity found among displaced children in Bamenda, Cameroon (Tambe et al., 2023). The difference on storage may reflect the two sources judging different things, since observers recorded whether storage was present while caregivers judged whether it was adequate to keep food safe. The fortified foods reported by 43.3 per cent of caregivers appeared within narrow diets, and Mbah (2025) has begun to study fortification in camps in the region, although that study's abstract reports no results. Whether the fortified foods in this camp came from aid rations could not be determined from the data and should be asked directly in the full study.

The observed conditions add to the picture given by caregivers. That no item was available in half of the households, and that emergency reserves were found in only 15.0 per cent, shows that most households could not absorb a delay in assistance without going short. Daodu, Shabu, Kile, and Enefu (2024) reported that 44.6 per cent of respondents in camps in Benue State often went a whole day and night without eating, and Keswet and Ibrahim (2025) found that exposure to the insurgency predicted household food insecurity among displaced caregivers in the North-East. For the children in these households, the lack of reserves means that each interruption in supply passes directly to their meals.

CONCLUSION AND RECOMMENDATIONS

Examining the distribution of responses showed that the mean scores hid substantial indecision on the questions about hunger, a minority of households with reliable access to food, answers on food sufficiency that refer to the present rather than the month, aid that is sufficient when it comes but irregular, and households with almost no food reserves. These results do not change the finding of low food security among households of displaced school children in the camp, but they show where mean scores alone mislead. They also point to changes in the wording of questions and the reporting of results that would make the full study more informative. The following recommendations are made.

1. Surveys of displaced households that use Likert-type items should report the share agreeing, undecided and disagreeing for each item alongside the mean, and should not describe an item as agreed unless most respondents agreed.
2. Questions on food sufficiency and children's hunger should state a time frame, such as the past seven days or the period since the last distribution.
3. The full study should record household income and other sources of support, so that the households that depend entirely on aid can be identified.
4. Humanitarian agencies and camp authorities should support safe storage and emergency food reserves at household level, since few households were observed to have them.
5. Humanitarian agencies serving the camp should give priority to the regularity of food assistance, since irregular supply rather than ration size was the main problem reported.

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