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Food Security and Nutrition Status of Smallholder FLNP Rice Farming Households in North Western Nigeria

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ABSTRACT
Food access and nutrition are related but distinct dimensions of household welfare. This study compared the food-security and food-nutrition status of 720 smallholder rice-farming households in selected communities of Kebbi and Sokoto States, comprising 360 beneficiaries and 360 non-beneficiaries of the Feed the Future Nigeria Livelihoods Project (FNLP). Household responses were classified using the dissertation's food-security and food-nutrition scales. Among beneficiaries, 342 households (95.0%) were classified as food secure, compared with 82 households (22.8%) among non-beneficiaries. Nutrition security was recorded for 344 beneficiary households (95.55%) and 127 non-beneficiary households (35.0%). The absolute differences were 72.2 percentage points for food security and 60.55 percentage points for nutrition security. The results indicate that favourable food access and nutrition-related conditions were much more common among beneficiaries in the sampled communities. They also show that nutrition security should not be inferred automatically from food-security classification, because the two measures produced different proportions among non-beneficiaries. The observed gaps may be consistent with the project's integrated livelihood, savings, agricultural and nutrition activities, but the cross-sectional and non-randomised design cannot establish causation. Programme design should continue to connect farm income, year-round food access, dietary diversity, care practices and health-related conditions. Future evaluation should report the exact scale items and validation properties, collect baseline and seasonal data, and adjust comparisons for pre-existing household differences.
Keywords: food security, nutrition security, smallholder farmers, rice households, livelihoods

INTRODUCTION

Food security requires sustained physical and economic access to sufficient, safe and nutritious food, while nutrition security also depends on dietary quality, health, care and the effective biological use of food (FAO, 1996, 2006). A household may therefore obtain enough staple food yet remain vulnerable to poor dietary diversity or illness. Keeping these outcomes separate is important when evaluating agriculture and livelihood programmes.

Smallholder households face multiple pathways to food insecurity. Production shocks can reduce own-consumption stocks and cash income at the same time; rising prices can weaken purchasing power; and large household needs can dilute available resources. Diversification, savings, irrigation and reliable market access may improve the stability of consumption (Waha et al., 2018; Dinegde et al., 2022).

FNLP combined agricultural and financial support with nutrition-sensitive activities. This paper compares food-security and food-nutrition classifications among beneficiary and non-beneficiary rice-farming households and considers what the divergence between the two indicators implies for programme design.

Conceptual framing

The analysis distinguishes food security from nutrition security. Food-security measures emphasise the ability to obtain adequate food, whereas nutrition measures address characteristics of diets and conditions that support healthy utilisation. Recent measurement research likewise cautions that household nutrition security cannot be reduced to food quantity or access alone (Calloway et al., 2022).

An integrated livelihoods perspective expects financial, productive and social assets to shape both outcomes. Higher farm returns and savings may improve access to food, while training, dietary knowledge, water, sanitation and health practices may influence nutrition. Because these mechanisms operate differently, separate reporting can reveal where a household is secure on one dimension but not the other.

Study context and intervention logic

Kebbi and Sokoto States form part of Nigeria's north-western agricultural belt, where rural livelihoods depend heavily on crop production, livestock, petty trade and seasonal labour. Rice is produced under both rain-fed and irrigated conditions. The production calendar creates a recurring financing problem: expenditure on land preparation, seed, nutrients, crop protection and labour is concentrated before harvest, whereas cash revenue is realised later. Households must therefore coordinate farm investment with food, health, education and other consumption needs.

The livelihood setting also exposes households to covariate and household-specific shocks. Rainfall variability, changes in river flow, insecurity, transport constraints, input-price inflation and unstable output markets may affect many farmers at once. Illness, loss of employment or an unexpected family obligation may affect a single household but produce the same immediate consequence: productive assets or food consumption may be reduced to bridge a cash deficit. These pressures explain why financial practices, production performance and food-related welfare should be analysed as connected rather than independent outcomes.

FNLP was designed as a multi-component intervention rather than a single input-distribution scheme. Its combination of livelihood mentoring, agricultural extension, financial education, savings mechanisms, nutrition and water, sanitation and hygiene activities created several possible pathways to household outcomes. Training could improve knowledge; group-based mechanisms could facilitate saving and information exchange; extension could improve production decisions; and nutrition-sensitive activities could influence the use of income and food within the household. Whether these pathways operated as intended depends on exposure, service quality and the wider economic environment.

The Sustainable Livelihoods Framework provides a useful organising perspective because it connects household assets, vulnerability, institutions, livelihood strategies and outcomes (DFID, 1999; Scoones, 2009). Human capital includes knowledge and health; financial capital includes cash, savings and credit; physical capital covers equipment and infrastructure; social capital includes groups and networks; and natural capital includes land and water. An intervention may strengthen one asset while a shock weakens

another. Consequently, a favourable outcome in one domain does not necessarily imply that the household is resilient in all domains.

For food and nutrition outcomes, the pathway extends beyond farm production. Own-produced food, cash income, market prices, household allocation, dietary knowledge, care and health conditions jointly influence the final status. This is why food access and nutrition-related conditions are reported separately and why an integrated programme may reasonably target both.

Figure 1. Pathways from livelihood support to food and nutrition outcomes

Source: Authors' conceptualisation based on the study framework.

MATERIALS AND METHODS

Study design and setting

The study used a cross-sectional comparative design to examine rice-farming households in selected communities of Kebbi and Sokoto States in north-western Nigeria. The setting combines rain-fed and irrigated rice production, and farm households operate under seasonal cash-flow constraints, variable access to inputs and extension, and exposure to price and climatic risks. The Feed the Future Nigeria Livelihoods Project was implemented from 2013 to 2018 through Catholic Relief Services and partner organisations with support from the United States Agency for International Development. Its activities combined livelihood support, financial education, savings mechanisms, agricultural extension, nutrition, and water, sanitation and hygiene interventions (Papineni et al., 2016; Larson et al., 2019).

Sampling and data collection

A multistage procedure selected six local government areas and 24 communities. Fifteen beneficiary and 15 non-beneficiary rice farmers were surveyed in each community, giving 720 respondents: 360 beneficiaries and 360 non-beneficiaries. Data were collected with a structured questionnaire covering household characteristics, financial practices, farm costs and returns, food-related experiences, nutrition-related conditions, access to services and respondents' assessments of programme implementation.

Analytical approach

The analysis used frequencies, percentages, farm-budget calculations and separate multiple-regression models for beneficiary and non-beneficiary households. The comparison is observational. Participation was not randomly assigned and baseline equivalence was not established. Consequently, group differences are interpreted as associations within the study sample rather than definitive causal effects of the programme.

Outcome classification

The dissertation classified households as food secure when the food-security score was 0–5 and food insecure when it exceeded 5. Households were classified as nutrition secure when the food-nutrition score was 0–3 and nutrition insecure when it exceeded 3.

RESULTS

Table 1. Household food-security status among rice farmers

Status	Beneficiaries n	Beneficiaries %	Non-beneficiaries n	Non-beneficiaries %
Food secure	342	95.00	82	22.80
Food insecure	18	5.00	278	77.20
Total	360	100.00	360	100.00

Source: Field Survey, 2024.

Food security was reported for 95.0% of beneficiaries but only 22.8% of non-beneficiaries, an absolute difference of 72.2 percentage points. Conversely, more than three-quarters of non-beneficiary households were classified as food insecure.

Table 2. Household food-nutrition status among rice farmers

Status	Beneficiaries	Beneficiaries %	Non-beneficiaries	Non-beneficiaries %
Nutrition secure	344	95.55	127	35.00
Nutrition insecure	16	4.45	233	65.00
Total	360	100.00	360	100.00

Source: Field Survey, 2024.

Nutrition security was also much more common among beneficiaries. Among non-beneficiaries, the share classified as nutrition secure exceeded the share classified as food secure by 12.2 percentage points, illustrating that the scales capture related but non-identical conditions.

DISCUSSION

The magnitude of the observed gaps indicates a strong association between beneficiary status and both household outcomes. The project's combination of agricultural support, financial education, savings and nutrition activities provides a plausible pathway, because increased production or income may improve food access while nutrition training may affect food choices and utilisation. The design, however, does not distinguish these programme mechanisms from prior differences between participants and non-participants.

The results reinforce the need to measure food and nutrition separately. Community studies have shown that dietary diversity and perceptions of adequate diets are shaped by production, markets, culture and household decision-making, not merely by the availability of staples (Nabuuma et al., 2021). Evidence from smallholder communities also links crop productivity with food and nutrition outcomes but indicates that demographic and institutional conditions matter (Hlatshwayo et al., 2023).

The high levels of insecurity among non-beneficiaries warrant attention irrespective of attribution. Interventions should address seasonal food gaps, income volatility and the cost of diverse diets. Nutrition-sensitive agriculture can promote legumes, vegetables and animal-source foods alongside rice, while savings and market measures can protect consumption during lean periods.

Programme and measurement implications

A food-secure classification should not end programme monitoring. Households may cross a threshold while remaining vulnerable to a poor harvest, illness or price increase. Monitoring should therefore include the stability of access across seasons, the strategies used during shortages and the extent to which productive assets are sold or debt is accumulated to maintain consumption.

Nutrition-sensitive programming should consider who controls income and food allocation within the household. Increased rice revenue can improve welfare, but the nutrition effect depends on whether resources are used to obtain a diverse diet, safe water, health care and appropriate feeding for children and other vulnerable members. Behavioural messages are more credible when households can obtain the foods being recommended.

The difference between the two non-beneficiary classifications illustrates the importance of indicator choice. Scales with different items and cut-offs can produce different estimates, even when they concern related aspects of welfare. A journal submission should append or clearly describe each item, the recall period, scoring rule, treatment of missing responses and empirical reliability.

Seasonality is another important measurement issue. A single survey round may capture a post-harvest period for some communities and a lean period for others. Repeated observations would show whether the favourable beneficiary pattern persisted through the year and whether group differences narrowed or widened when food prices or farm expenses increased.

Conclusion and policy implications

Beneficiary households were much more likely than non-beneficiary households to be classified as food secure and nutrition secure. These descriptive findings support continued integration of livelihood and nutrition components, but they should not be presented as causal programme impacts.

Future programmes should monitor food access and dietary quality across seasons, disaggregate outcomes by gender and household composition, and establish referral links for households facing severe deprivation. Future research should use validated multi-item scales, report reliability, examine concordance between indicators and collect baseline or panel data.

Study limitations

The classifications rely on self-reported cross-sectional data and fixed cut-offs. Seasonal variation, measurement error and selection into programme participation may affect the estimates.

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