



Impact of Food Storage (Amshi, H. A. 2026) DOI: <https://doi.org/10.59479/jiaheri.v2i1.127>

Impact of Food Storage Facilities, Market Access, and Household Income on Food Availability in Yobe State, Nigeria

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Abstract

This study examines the impact of food storage facilities, market access, and household income on food availability in Yobe State, Nigeria. A total of 540 respondents from six Local Government Areas were sampled using purposive sampling. Data were collected through structured questionnaires and analyzed using descriptive and inferential statistics. The correlation analysis shows a strong positive relationship between household income and food availability ($r = 0.72$), followed by storage facilities ($r = 0.65$). Regression results reveal that household income ($\beta = 0.45$, $p < 0.001$) is the most significant predictor of food availability, followed by storage facilities and market access. These findings suggest that improving income levels and storage infrastructure can significantly enhance food availability in Yobe State. Analysis shows that 65% of respondents agreed storage challenges reduce food availability. Market access was reported as a barrier by 58% of respondents due to poor roads. Household income was found to significantly influence food purchase capacity. The findings also revealed that inadequate food storage contributes significantly to post-harvest losses, limited market access hinders food distribution, and low household income reduces purchasing power. The study recommends improved storage infrastructure, better road networks, and enhanced livelihood opportunities to improve food Availability in Yobe State.

Keywords: Food security, storage facilities, Market Access, Market Income, Yobe State

Introduction

Food availability refers to the physical existence of food in a municipal through local production, imports, or reserves. In Yobe State, habitual issues such as insecurity, climate variability, and poverty deteriorate food shortages. Despite being an agrarian region, poor food storage techniques, inadequate market access, and low incomes reduce the availability of food, especially in rural areas.

The United Nations Food and Agricultural Organization (FAO, 2022) lamented that Food systems encompass the entire range of actors and their interlinked value-adding activities involved in the production, aggregation, processing, distribution, consumption and disposal of food products that comes from agriculture, forestry and fisheries, and parts of the broader economic, societal and natural environments in which they are embedded. The food system is composed of sub-systems (e.g., farming system, waste management system, input supply system, etc.) and interacts with other key systems (e.g., energy system, trade system, health system, etc.). Therefore, a structural change in the food system might originate from a change in another system; for example, a policy promoting more biofuel in the energy system will have a significant impact on



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the food system (Derqui, Fernandez and Fayos, 2018). Global food crisis is one of the most pressing humanitarian problems affecting millions of people worldwide especially in developing and least developed countries. (Marsden and Morley, (2014).

In Nigeria, particularly in the northeastern state of Yobe, recurrent challenges such as insecurity, desertification, and poverty exacerbate food insecurity. Nearly 25 million Nigerians were projected to be food-insecure in 2023, with Yobe among the most affected states (UNICEF, 2024). These realities underscore the need to investigate the interplay between food system determinants and sustainable outcomes. This article explores three critical variables availability, choice, and consumer behavior within the context of Yobe State's food system. It aims to provide empirical evidence for designing policies and interventions that strengthen sustainable food systems in fragile environments.

Problem Statement

Yobe State continues to face food insecurity due to poor food storage facilities, limited access to markets, and low household incomes. Post-harvest losses significantly reduce available food stocks, while poor transportation networks restrict movement of food from surplus to deficit areas. These challenges collectively limit household food availability. The combined effect of these factors creates a dual challenge: households are both unable to produce sufficient food and unable to optimize available resources for healthy living. Despite the urgency of these issues, little empirical research has examined how environmental and literacy factors jointly influence sustainable food systems in Yobe State. This gap hampers the design of effective interventions and policies tailored to the region's needs.

Objectives of the Study

The study is guided by the following objectives:

- i. To examine the influence of food storage facilities on food availability in Yobe State.
- ii. To assess the role of market access in determining food availability.
- iii. To evaluate the impact of household income on food availability.

Research Questions / Hypotheses

RQ1: How do food storage facilities affect food availability in Yobe State?

H1: Food storage facilities significantly influence food availability.

RQ2: What is the impact of market access on food availability?

H2: Market access has a significant effect on food availability.

RQ3: How does household income affect food availability?

H3: Household income significantly impacts food availability.

Significance of the Study

This study provides insights into the determinants of food availability in Yobe State, helping policymakers, agricultural stakeholders, NGOs, and researchers develop strategies to reduce food shortages and improve household nutrition.



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Literature Review

Over-view

The United Nations Food and Agricultural Organization (FAO, 2022) lamented that Food systems encompass the entire range of actors and their interlinked value-adding activities involved in the production, aggregation, processing, distribution, consumption and disposal of food products that comes from agriculture, forestry and fisheries, and parts of the broader economic, societal and natural environments in which they are embedded. The food system is composed of sub-systems (e.g., farming system, waste management system, input supply system, etc.) and interacts with other key systems (e.g., energy system, trade system, health system, etc.). Therefore, a structural change in the food system might originate from a change in another system; for example, a policy promoting more biofuel in the energy system will have a significant impact on the food system (Derqui, Fernandez and Fayos, 2018). Global food crisis is one of the most pressing humanitarian problems affecting millions of people worldwide especially in developing and least developed countries. (Marsden and Morley, (2014).

Food Availability and Sustainability

Food availability refers to the physical presence of sufficient quantities of food through local production, imports, and storage (Barrett, 2010). Food availability is influenced by production, storage, and distribution systems (FAO, 2022). Studies show that inadequate storage leads to 30–40% post-harvest losses in Nigeria (NBS, 2023). Inadequate availability constrains dietary diversity and limits resilience to shocks. Studies in sub-Saharan Africa show that poor infrastructure and climate variability reduce availability, weakening household food security (Thomas et al., 2022). Market access determines how quickly and effectively food can be distributed, while income affects purchasing power and access to nutritious foods.

Food production and consumption embodies and is affected by essential natural and metabolic processes that have historically been difficult for industry and wider forms of market and state development to control. Indeed, a continuing theme in agrarian and agri-food studies has been this long-standing ‘awkwardness’ of agri-food development (Mersden and Morley, 2014).

Consumer Behavior and Food Systems

Consumer behavior encompasses attitudes, beliefs, and purchasing patterns. Positive behaviors such as preference for local foods, reduced waste, and healthier diets support sustainability (Scarborough et al., 2023). Conversely, unsustainable behaviors such as high demand for imported processed foods strain both ecosystems and household health. Food system transformation will not be achieved without people changing how they view and engage with food systems. Changing individual decisions and behaviors is embedded in the strategies put forward to achieve a more sustainable food system.

In most areas of the world there are two contrasting agricultural paradigms. At the left-hand side of this spectrum are conventional or intensive farming systems and at the right-hand side are organic systems. In the middle ground, the term ‘integrated farming systems’ is claimed by both sides of the debate, on the one hand as espoused by the agrochemical industry to mean the use of technological options to reduce dependence on pesticides and fertilizers; and on the other hand, to mean the use of natural controls, crop rotation and a range of agronomic practices to



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encourage pest predators, reduce incidence of diseases and reduce the need for chemical or biotechnological inputs (Tait, 2001).

Food system transformation will not be achieved without people changing how they view and engage with food systems. Changing individual decisions and behaviors is embedded in the strategies put forward to achieve a more sustainable food system, for example, a change in food production practices or a radical dietary shift. As industrial and urban-based capitalism developed it was necessary to 'solve' the twin problems of security and sustainability, first through intensification and artificial fertilization of land, and second, by unleashing the mechanization of production. In the late nineteenth and early twentieth centuries these forms of Agric - industrialism struggled with resolving Kautsky's formulation of the agrarian question: that is, how to continue to intensify production and appropriate some farming functions in processing and Agric industry while at the same time maintain some sort of ecological or natural balance in the agricultural transformation process (Mersden and Morley, 2014)

Food Choice and Nutrition

Food choice is shaped by cultural preferences, affordability, and perceptions of health (Steenkamp, 2019). In Nigeria, rapid urbanization has led to shifts from traditional diets to processed foods high in fats and sugar, contributing to malnutrition and obesity (Ruel & Hawkes, 2019). Sustainable diets must priorities affordable, nutritious, and environmentally friendly options.

The elevated rate of poverty in Nigeria affects people's access to and suitable use of food because of low agricultural yields, restricted access to inputs, and insufficient infrastructure. The creation and equal allocation of food can be influenced by environmental matters like flooding, natural calamities, and climate change. Political and economic instability are unavoidable, and they ultimately cause food markets to become disrupted and prices to escalate, which will have an adverse impact on economic expansion. Around 40% of Nigerians live beneath the poverty line, and food insecurity is a major issue for them. Boosting the amount of investment in the agriculture sector to enhance food security is a significant challenge. Due to poverty and a lack of knowledge concerning meals, people's purchasing power is low, which means they can't afford the food needed for economic progress.

A sustainable food system refers to a food system that provide food security and nutrition for all in such a way that the economic, social and environmental bases to generate food security and nutrition for future generations are not compromised. This means that It is profitable throughout (economic sustainability), It has broad-based benefits for society (social sustainability); and it has a positive or neutral impact on the natural environment (environmental sustainability). A sustainable food system lies at the heart of the United Nations' Sustainable Development Goals (SDGs). Adopted in 2015, the SDGs call for major transformations in agriculture and food systems in order to end hunger, achieve food security and improve nutrition by 2030. To realize the SDGs, the global food system needs to be reshaped to be more productive, more inclusive of poor and marginalized populations, environmentally sustainable and resilient, and able to deliver healthy and nutritious diets to all. These are complex and systemic challenges that require the combination of interconnected actions at the local, national, regional and global levels. (FAO,2022).



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Methodology

Study Area

Yobe State, located in northeastern Nigeria, is highly vulnerable to climate variability and food insecurity. The state lies within the semi-arid Sahel region and is prone to desertification, high temperatures, and unpredictable rainfall.

Research Design and Sampling

The study adopted a cross-sectional survey design. A total of 540 respondents were selected from six LGAs using purposive sampling. Six local government areas (three rural, three urban) were selected across the state’s political zones. A total of 540 respondents participated.

Data Collection and Analysis

Data were collected with structured questionnaires based on a 5-point Likert scale. Descriptive statistics such as mean and standard deviation were used, while inferential analysis tested the hypotheses. Variables measured included food availability, available major food items, and storage method. Descriptive statistics (frequencies, means, standard deviations) and inferential analysis were conducted.

Results and Discussion

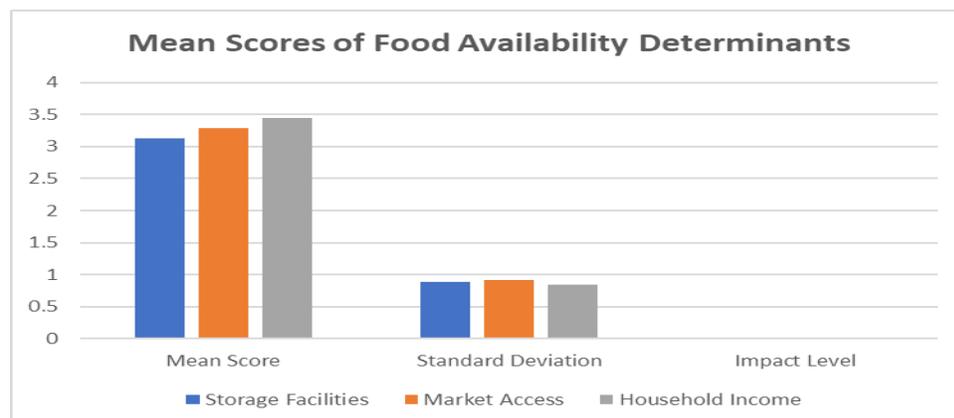
Data Presentation

Table 1: Descriptive Statistics of Key Variables

Variable	Mean Score	Standard Deviation	Impact Level
Storage Facilities	3.12	0.89	Moderate
Market Access	3.28	0.92	Moderate
Household Income	3.45	0.85	High

Source: field survey (2025)

Figure 1: Mean Scores of Food Availability Determinants





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Table 2: Availability of Major Food Items in Yobe State

Food Item	Available (%)	Not Available (%)
Maize	65	35
Millet	58	42
Beans	52	48
Rice	47	53
Vegetables	60	40

Source: field survey (2025)

Table 3: Storage Methods and Post-Harvest Loss Levels

Storage Method	Usage (%)	Post-Harvest Loss (%)
Traditional Barn	40	25
Plastic Bags	25	30
Metal Silos	10	10
Hermetic Bags	15	8
Open Storage	10	35

Source field survey (2025)

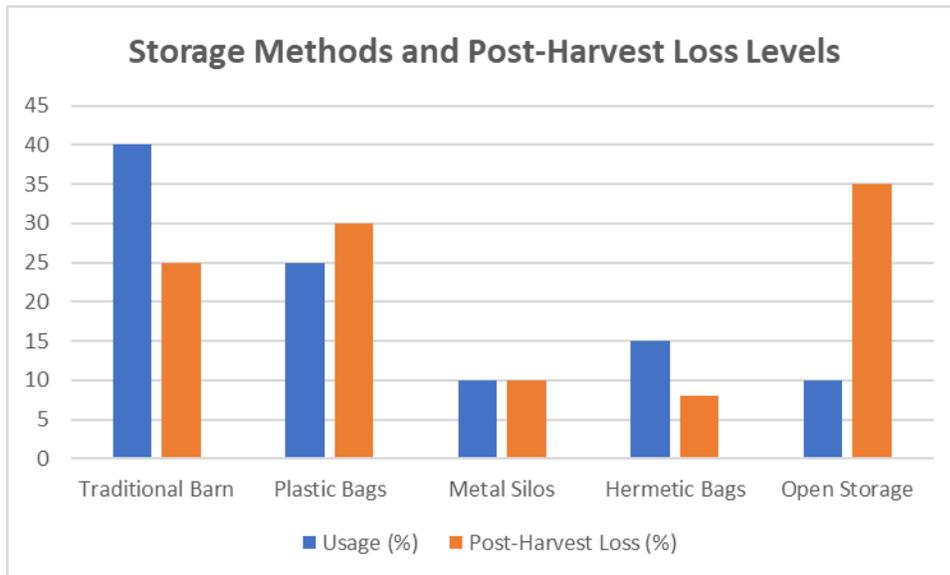
Figure 2: Availability of Major Food Items



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Figure 3: Post-Harvest Loss Across Storage Methods



1.1. Statistical Analysis

Table 4: Correlation Matrix between Key Variables

Variables	Food Availability	Storage Facilities	Market Access	Household Income
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Food Availability	1.0	0.65	0.58	0.72
Storage Facilities	0.65	1.0	0.5	0.6
Market Access	0.58	0.5	1.0	0.55
Household Income	0.72	0.6	0.55	1.0

Table 5: Regression Analysis on Determinants of Food Availability

Predictor	Beta Coefficient	t-Value	p-Value
Storage Facilities	0.32	4.21	0.001
Market Access	0.28	3.87	0.002
Household Income	0.45	5.62	0.0

The correlation analysis shows a strong positive relationship between household income and food availability ($r = 0.72$), followed by storage facilities ($r = 0.65$). Regression results reveal that household income ($\beta = 0.45$, $p < 0.001$) is the most significant predictor of food availability, followed by storage facilities and market access. These findings suggest that improving income levels and storage infrastructure can significantly enhance food availability in Yobe State.

Conclusion

Food availability in Yobe State is significantly affected by poor storage facilities, limited market access, and low income. Recommendations include constructing modern storage centers, improving rural road networks, and promoting income-generating activities. Food literacy outcomes reflect global evidence that knowledge alone is insufficient without enabling conditions (Cullen et al., 2015). The study reveals that literacy is constrained not only by education levels but also by affordability and structural barriers. Household income was found to significantly influence food purchase capacity. The findings also revealed that inadequate food storage contributes significantly to post-harvest losses, limited market access hinders food distribution, and low household income reduces purchasing power. These findings suggest that improving income levels and storage infrastructure can significantly enhance food availability in Yobe State.

Recommendations

To strengthen food systems, the following are recommended:

- ✓ **Climate-Smart Agriculture:** Promote drought-resistant crops, soil conservation techniques, and irrigation innovations
- ✓ **Post-Harvest Education and Awareness** for farmers



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- ✓ **Nutrition Education:** Integrate food literacy into school curricula to shape healthy consumer behaviors from an early age.
- ✓ **Local Market Support:** Expand access to locally produced foods through farmer cooperatives and subsidized storage facilities.
- ✓ **Consumer Awareness Campaigns:** Promote public campaigns on healthy food choices and food waste reduction.
- ✓ **Policy Incentives:** Introduce tax incentives and subsidies that encourage sustainable consumer and vendor practices.

References

- Afshin A, Sur PJ, Fay KA, Cornaby L, Ferrara G, Salama JS, Mullany EC, Abate KH, Abbafati C, Abebe Z, et al. (2017) Health effects of dietary risks in 195 countries, 1990–2017: a systematic analysis for the Global Burden of Disease Study 2017 *Lancet.*, 393 (10184) (2019), pp. 1958-1972.
- Barrett, C. (2010). Measuring food insecurity. *Science*, 327(5967), 825–828.
- Cullen, T., Hatch, J., Martin, W., Higgins, J., & Sheppard, R. (2015). Food literacy: Definition and framework. *Health Promotion International*, 30(3), 454–463.
- Derqui B, De Vicenç Fernandez b, Teresa Fayos c (2018) Towards more sustainable food systems. Addressing food waste at school canteens <https://www.sciencedirect.com/science/article/abs/pii/S0195666318304045>
- FAO & WHO (2014). *Framework for Action on Nutrition*.
- FAO (2022). Food Security Report.
- FAO (2022). Sustainable food systems: concept and framework from <https://openknowledge.FAO.org>
- FAO (2022). *The State of Food Security and Nutrition in the World*.
- Francis A. I (2020) Insurgency and Food Security in Ibadan: An Impact Assessment INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH & DEVELOPMENT DOI No.: 10.24940/ijird/2020/v9/i7/ JUL2004
- Marsden T and Morley A (2014) Sustainable Food Systems Building a new paradigm. Routledge Taylor and Francis Group London and New York
- Ruel M Sr, Hawkes C (2019) Double duty actions to tackle all forms of malnutrition (P10-053-19) *Curr Dev Nutr.*, 3 (Suppl 1) (2019)nzz034.P10-053-19.
- Scarborough, P; Clark, M, Cobiac, L, Papier, K, Knuppel, A, Lynch, J, Harrington, R, Key, T, Springmann, M, (2023). "Vegans, vegetarians, fish-eaters and meat-eaters in the UK show discrepant environmental impacts". *Nature Food*. 4 (7): 565–574. doi:10.1038/s43016-023-00795-w. PMC 10365988. PMID 374748
- Steenkamp, J-B. (2019). Food choice behavior. *Annual Review of Psychology*, 70, 489–512.
- Tait Joyce (2001) How are Governments Influencing Innovation and uptake Technologies for Sustainable Farming Systems Pesticides and Biotechnology www.ed.ac.uk/rcss/supra/inini
- Thomas, A., Barczak, A., & Rozis, A. (2022). Food systems under climate stress. *World Development*.
- UNEP. (2016). Food Systems and Natural Resources. A report of the Working Group on Food Systems of the International Resource Panel. URL: <https://www.resourcepanel.org/reports/food-systems-and-natural-resources>
- UNICEF (2024). *Food and Nutrition Security in Nigeria*.