

INFLUENCE OF FUNCTIONAL LITERACY ON FOOD SECURITY AMONG CROP FARMERS IN BORNO SOUTH SENATORIAL DISTRICT

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Abstract

This study examines agricultural literacy as a predictor of food security in Nigeria. Five research objectives were raised to guide this study. Descriptive research design of survey type was adopted for this study. A self-structured and validated questionnaire was used to elicit information. The data collected were analyzed using frequency counts, and percentage. Finding revealed that low-level of agricultural literacy exists in the studied area. It was revealed that food inflation, hunger, malnutrition, and high mortality rate are the effects of food insecurity. It was revealed that inadequate educational opportunities for farmers, lack of access to ICT, negative attitude and poverty are factors undermining agricultural literacy. It was also revealed that agricultural literacy is capable of solving unemployment rate, improving socio-economic development of farmers, higher productivity, and economic growth of the nation. The study concluded that agricultural literacy is a catalyst of achieving zero hunger, strengthening local economy and fostering sustainable agricultural practices in Nigeria. The study recommended that Government should develop and implement a comprehensive content-driven agricultural literacy to enhance farmers' technical know-how on sustainable agricultural practices for economic growth.

Keywords: Agricultural Literacy, Food Insecurity, Food Security, Nigeria.

Introduction

Food insecurity intensifies global food crisis, resulting into grave hunger that is taking heavy toll on developing and under-developed nations. Agricultural practice is characterized by a large number of farmers with limited formal education, who engages in unsustainable agricultural practices of excessive chemical usage such as synthetic fertilizers, pesticides and herbicides, intensive farming, poor soil management, inefficient water use, deforestation, and bush burning leading to environmental degradation, climate change, food insecurity and acute hunger that affects families and communities across Africa and Nigeria in particular. An estimated 828 million people faced acute hunger globally. One in eleven people faced hunger globally while one in five people faced hunger in Africa. Over 90 million children under age

five are dangerously affected by acute hunger, undernourishment, and underweight, while severe food insecurity appears to be increasing in almost all regions of Africa, as well as Nigeria (UNDP, 2022).

Food security remains a pressing challenge in Nigeria, particularly in the northeastern region where protracted conflict, environmental degradation, and economic instability have severely undermined agricultural livelihoods. Borno State, located in this region, has witnessed more than a decade of insurgency and violence that has displaced millions and disrupted farming systems. According to the World Food Programme (2025), over 4.8 million people in Borno, Adamawa, and Yobe states faced acute food insecurity during the 2024 lean season due to conflict-related disruptions and climate shocks. Nationally, the Cadre Harmonisé (2024) assessment reports that over 31.8 million Nigerians are acutely food insecure, with the majority residing in rural areas that depend on rain-fed agriculture for survival.

The Borno South Senatorial District of Borno State, though relatively more stable than the northern zone, still bears the economic and infrastructural scars of conflict. Agricultural production is low, with crop farmers who constitute a significant portion of the population still facing multidimensional barriers that limit their productivity and food access (Ashagidigbi, Orilua, Olagunju & Omotayo, 2022). Most notably, literacy and education levels among crop farmers in this region remain critically low, with reports indicating that over 80% of adults in the northeast are functionally illiterate (Vanguard, 2018). Functional literacy the practical ability to read, write, and use arithmetic in daily life has been identified as a key determinant of agricultural and household productivity (Mbah, 2015). When crop farmers can interpret agro-extension materials, understand market prices, manage household finances, and participate in cooperatives, they are more empowered to make decisions that affect food production and security. Literacy will enable crop farmers to record farm inputs and outputs, understand planting calendars, and respond effectively to early warning messages about climate or pest outbreaks (Brown, Mugo, Petersen & Klauser, 2022; Aroge & Olaniyi, 2020; Ndlovu, Prinsloo & le Roux, 2020).

Despite the known importance of functional literacy, few studies have explored **its** direct impact on food security among crop farmers in conflict-affected areas. This research therefore seeks to fill that gap by assessing the relationship between functional literacy and household food security among crop farmers in the Borno South Senatorial District of Borno State. The findings will help design more targeted interventions that will not only provide literacy education but also link it with agricultural training and food systems development. Agricultural literacy refers to the ability of individuals to understand and critically engage with the agricultural system, encompassing various aspects such as farming practices, food production processes, environmental sustainability, and the broader implications of agriculture on society (Smith, 2018). Similarly, Thompson (2017) defines agricultural literacy as a comprehensive concept that encompasses the knowledge, skills, and technical know-how for

individuals to make informed decisions about agriculture and its multifaceted impact on their lives, communities, and the global environment.

Food security refers to the availability, accessibility and affordability of sufficient, safe, and nutritious food to meet the dietary needs and preferences of individuals and communities (UNDP, 2022). The United Nations Food and Agriculture Organization defines food insecurity as a situation that exists when people lack secure access to sufficient amounts of safe and nutritious food for normal growth and development, active and healthy life (FAO, 2022).

Food insecurity in Nigeria is caused by a flawed land tenure system, limited adoption of irrigation farming, the impact of climate change, soil degradation, outdated technology, inadequate knowledge, expensive production processes, and unequal distribution of resources, limited financial support, significant post-harvest losses and limited market access. These issues have hindered agricultural output, which has had a negative impact on the sector's contribution to the country's Gross Domestic Product (Onwe, Ojide, Subhan & Forgenie, 2024). Similarly, Afolami (2019) opine that unsustainable agricultural practices are caused by excessive chemical usage such as synthetic fertilizers, pesticides and herbicides, intensive farming, poor soil management, inefficient water use, deforestation, and bush burning leading to environmental degradation, climate change and food insecurity. This no doubt culminates into the surge of food prices, food insecurity and food scarcity, which often result into widespread of hunger, malnutrition and high mortality rate among the vulnerable groups of children and women in Nigeria.

Statement of the Problem

Nigerian agricultural practice is characterized by a large number of farmers with limited formal education, who lacks requisite knowledge, skills and technical know-how of sustainable agricultural practices. This is culminating into food insecurity, food scarcity, food inflation, malnutrition, acute hunger and high mortality rate. Sustainable agriculture requires equipping farmers with the needed knowledge, skills and technical know-how of sustainable agricultural practices to carry-out their duties efficiently and enhance higher productivity (Olayemi, 2020). Hence, the need for agricultural literacy to achieve food security and zero hunger in Nigeria. Agricultural literacy is a fundamental component of understanding and engaging with the complex world of agriculture. It involves having the knowledge and awareness to comprehend the practices, processes, and significance of agriculture in our daily lives.

Food insecurity is both a symptom and a driver of poverty in rural Nigeria, particularly among women-headed households who often lack access to productive assets, extension services, and decision-making authority. In Borno State, where decades of insurgency have decimated infrastructure and displaced communities, agriculture remains the primary livelihood for most rural dwellers with reduced farm sizes due to fear of bandits and terrorists. Also, due to deeply entrenched inequalities, most crop farmers especially women frequently lack access to land, credit, and education, factors that are critical for improving farm

productivity and ensuring household food security (Food and Agricultural Organization, FAO, 2021; Ashagidigbi *et al.*, 2022).

Functional illiteracy also excludes vulnerable crop farmers from agricultural extension programs and market information systems, which are typically designed for literate participants (Mbah, 2015). As a result, crop farmers are less likely to adopt improved farming technologies or practices, leading to low yields and unstable incomes. This creates a vicious cycle in which poverty, illiteracy, and food insecurity reinforce each other. Despite the clear theoretical links between literacy and food security, there is limited empirical data showing how improved literacy impacts food access and stability in crop farming households especially in female-headed or female-managed households, particularly in conflict-affected regions like Borno South. The problem is further exacerbated by the lack of accessible adult education and functional literacy programs tailored to rural crop farmers' needs. Most existing education programs are urban-centric or designed without integrating agricultural content. Without targeted interventions that address both education and food production, crop farmers in Borno South Senatorial District are likely to remain trapped in food-insecure conditions. It is, therefore, imperative to investigate how improving functional literacy among crop farmers can serve as a sustainable solution to household food security and contribute to broader rural development goals.

Objectives of the Study

The study was guided by the following objectives to:

1. Determine the food security status among crop-farming households in Borno South Senatorial District.
2. Analyze the relationship between functional literacy and household food security outcomes in the study area.
3. Identify constraints faced by crop farmers in accessing functional literacy programs; and
4. Propose strategies to improve their food security using functional literacy.

Methodology

This was cross-sectional, mixed-methods study combining quantitative surveys with qualitative interviews. This design allows measurement of literacy levels and food security status, and also gathers contextual insights. The target population is adult crop farmers who are principal crop farmers or co-farmers in rural communities of the nine Local Government Areas making up Borno South (Biu, Askira-Uba, Bayo, Chibok, Damboa, Gwoza, Hawul, Kwaya Kusar, Shani). These LGAs cover mostly agrarian and semi-agrarian communities in the district. Assuming an adult crop farmer population of tens of thousands, we were used Cochran's formula to achieve a statistically representative sample (95% confidence, $\pm 5\%$ precision), yielding a target sample of about 300 crop farmers. We were used multi-stage sampling: first randomly select 4 of the 9 LGAs, then within each selected LGA randomly select numerous crop farming communities, and finally randomly sample households with crop

farmers in those communities. This was ensuring geographic spread and representativeness. Data was collected via (a) a structured household questionnaire administered by trained enumerators, (b) a literacy assessment (basic reading/numeracy tasks) for each respondent, and (c) food security assessment using a standard index (such as the FAO Household Food Insecurity Access Scale or Dietary Diversity Score). The questionnaire was covered demographics, farm practices, income, constraints, and coping strategies. In addition, key informant interviews and focus group discussions was held with some crop farmers and community leaders to explore qualitative aspects of literacy and food access. We recruited and train enumerators on ethical research practices and tool administration. The literacy assessment was piloted to ensure cultural appropriateness. During data collection, enumerators was visited sampled households, obtain informed consent, and conduct interviews in Hausa or Kanuri as needed. The Researchers will monitor fieldwork and data quality. Quantitative data was entered into statistical software for analysis. Descriptive statistics was summarizing literacy levels and food security indicators. Inferential analysis (correlation, logistic or multiple regression) was examined relationship between functional literacy measures and food security outcomes, controlling for socio-economic variables. The qualitative data (from interviews and FGDs) was transcribed and analyzed thematically to illustrate how functional literacy affects crop farming decisions and food management. Findings was triangulated to ensure robust conclusions.

Results

Table 1 showed that majority 75.7% of the respondents were males while 24.3% of them were females. This reveals that farming households in the study are dominated by male household heads. It also shows that most of the respondents 66.7% fell within the age range of (21–40) years. This indicates that majority of them were still vibrant, active and productive in farming. According to Basudeb et al., (2022), most rural farmers were agile and physically disposed to pursue agricultural production and related activities. The result further reveals that majority of the respondents 91.3% were married while 55.2% had no formal education. This finding shows the need to assist the farmers to improve on their level of education to widen their knowledge and increase their flexibility in adopting modern farming methods. Again, greater majority of the respondents 76.0% had household size of between (11-20) persons. Obviously, large household size is an important factor in agricultural production for the supply of manual farm labour (Omotesho et al., 2010).

Also, 78.8% of the respondents had farming experience of 21 years and above. Thus, given the necessary support in terms of grants, inputs and subsidy, the respondents had adequate years of farming experience that enable them engage in extensive farm production so as to avert hunger and undernourishment in their respective farm households. Results in Table 1 further reveals that majority of the farmers produce at subsistence level as 67.2% of them maintain farm size of between (1 and 4) hectares. This shows that they are mainly small-scale farm households. Small scale farming affects human capital, labour requirement and land

tenure arrangement, as it would not allow for meaningful investment and returns on agricultural production. Finally, the result in Table 1 shows that a whopping percentage of the respondents 93.7% had no access to formal loan. This implies that they face financial incapacitation in carrying out agricultural production in the study area. Credit is an important factor in agricultural production especially in purchasing of farm inputs and hiring of labour (Abah et al., 2024).

Table 1: Distribution of respondents by socio-economic features (n = 288)

S/N	VARIABLE	FREQUENCY	PERCENTAGE
1	Gender		
	Male	218	75.7
	Female	70	24.3
2	Age		
	10–20	12	4.2
	21–30	66	22.9
	31–40	126	43.8
	Above 40	84	29.1
3	Marital status		
	Single	0	0.0
	Married	263	91.3
	Divorced	0	0.0
	Widowed	25	8.7
4	Educational qualification		
	No formal Education	159	55.2
	Attended Primary	78	27.1
	Attended Secondary	51	17.7
	Attended Tertiary	0	0.0
5	Household size		
	5–10	34	11.8
	11–15	106	36.8
	16–20	113	39.2
	Above 20	35	12.2
6	Farming experience		
	1–10	29	10.1
	11–20	32	11.1
	21–30	140	48.6
	Above 30	87	30.2
7	Farm size		
	1–2	91	31.6

	3–4	103	35.8
	5–6	53	18.4
	8–10	29	10.1
	Above 10	12	4.1
8	Access to formal loan		
	Access	18	6.3
	No access	270	93.7

Source: Field survey, 2026

The distribution of respondents according to their perception on factors promoting food insecurity among farm households in Biu Local Government Area of Borno state was analyzed using a 4-point Likert rating scale as presented in table 2. Following the decision rule, mean scores of 2.5 and above indicated agreement while those below 2.5 showed disagreement. Based on the result in table 3, the respondents agreed that factors such as poverty (mean = 3.7), poor crop yield (mean = 3.6), illiteracy (3.5), lack of improved crop/livestock varieties (mean = 3.4), lack of governmental support (mean = 3.3), high cost of farm input (mean = 3.2), pests/disease attack (mean = 3.1) and socio-political crises (3.0) play critical role in promoting food insecurity in the study area. Table 2 further revealed that the respondents were of the opinion that factors such as low level of farm technology (mean = 1.8), environmental hazards (mean = 2.0), scarcity of farmland (mean = 2.1) and poor extension services had no pronounced influence on the promotion of hunger and malnutrition in the study area. This finding is in consonance with that of Otaeha (2015) who opined that poverty, conflict, bad governance, natural disaster, high cost of farm input as well as low literacy level were the major factors promoting food insecurity in Nigeria.

Table 2: Distribution of respondents by perception on factors promoting food insecurity

S/N	FACTOR	SA	A	D	SD	MEAN	DECISION
1	Poverty	852	225	0	0	3.7	Agree
2	Socio-political crises	460	318	84	25	3.0	Agree
3	Environmental hazards	64	81	362	64	2.0	Disagree
4	Poor extension services	96	114	406	26	2.2	Disagree
5	Low literacy level	708	258	36	7	3.5	Agree
6	Lack of governmental support	572	282	64	19	3.3	Agree

7	Poor crop yields	696	303	26	0	3.6	Agree
8	Scarcity of farmland	124	78	262	100	2.1	Disagree
9	Pest/disease attack	392	438	80	4	3.1	Agree
10	High cost of farm inputs	452	366	92	7	3.2	Agree
11	Lack of improved crop/livestock varieties	660	264	70	0	3.4	Agree
12	Low level of farm technology	76	69	288	102	1.8	Disagree

Source: Field survey, 2026 *Decision rule: Take 2.5 and above as agree, otherwise as disagree

Result of the multiple regression analysis presented in table 3 revealed that the coefficient of multiple determination (R²) was 78.2%, while the adjusted (R²) was 64.5%. This result implies that about 78.2% change on the dependent variable (food insecurity) was caused by the combined effects of the socio-economic variables included in the multiple regression model. The outstanding 21.8% variation was attributable to some variables that are relevant to it, but were not incorporated in this multiple regression model. In comparison, the value of coefficient of multiple determination R² (78.2%) is very close to that of the adjusted (R²) indicating that the multiple regression model was not exaggerated. Again, the value of the F-ratio (1.34) is low which indicates statistical reliability as the value of the standard error estimates (0.168) was also low. The coefficients of gender (X₁) and age (X₂) were positive and statistically significant at 1 % level respectively. This is an indication that both gender and age have positive influence on farm households' ability to provide for their families. Thus, this finding is in line with the a priori expectations (an a priori argument, reason, or probability is based on an assumed principle or fact, rather than on actual observed facts). The coefficients of marital status (X₃) and educational qualification (X₄) had both positive sign and statistically significant at 10% and 1% levels respectively. This is in agreement with the findings of Emmanuel (2018), who observed that marital status and level of education have positive influence on a family's food security. Besides, household size (X₅) was positive and significant at 1% level, farming experience (X₆) was also positive and significant at 1% level, farm size (X₇) is positive and statistically significant at 1% level while access to credit (X₈) is positive and statistically significant as well but at 5% level. The above findings concurred with Okpolu

et al (2018) who studied household food security among rural household in Biu Local Government Area of Borno state and obtained similar results.

Table 3: Regression analysis on effects of socio- economic variables on the food security status of farming households

Variable (symbol)	Variable (name)	Regression coefficient	Standard errors	T-value	Level of significance
X	Constant	1.573	.514	3.026	.005
X1	Gender	.107	.075	1.056	.027
X2	Age	.060	.080	.573	.008
X3	Marital status	.000	.085	-.003	.100
X4	Educational qualification	.133	.103	1.173	.023
X5	Household size	.010	.114	.089	.009
X6	Farming experience	.082	.084	.883	.041
X7	Farm size	.173	.091	2.020	.035
X8	Access to credit	.154	.106	1.448	.016

$R^2 = 78.2\%$

Adjusted $R^2 = 64.5\%$

F-Ratio = 1.34

Standard error value = 0.168

Source: Field survey, 2026.

Conclusion and Recommendations

Food unlike other commodities is indispensable for man's existence. Thus, all efforts must be geared towards improving its production and distribution on sustainable basis in every household. Unfortunately, most of the food production activities in Nigeria are carried out by rural farmers who lack capital, skills, security, energy and other necessary inputs required for large scale production. In line with the findings of this study, it was concluded that the socio-economic and political factors that pose threats to agricultural production such as poverty, poor crop yield, illiteracy, lack of improved crop/livestock varieties, lack of governmental support, high cost of farm input, pests/disease attack and socio-political crises should be addressed through wholistic approach. Based on the findings of this research, I hereby recommend as follows:

1. Government should make free and compulsory out of school education programmes a priority through adequate funding of agricultural extension services in order to improve the educational and associated features of the respondents in the study area.

2. Government should provide regular farm incentives such as grants, subsidized inputs, loan, improved crop/livestock varieties and modern farm equipment for the rural farming households.
3. Government should show genuine support for rural farmers in order to reduce poverty, high cost of farm inputs and lack of improved crop/livestock varieties.

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