



EXTENSION PARTICIPATION AND ITS PREDICTORS: A STUDY OF MAIZE FARMERS IN THE FFBS PROGRAM ACROSS KADUNA AND KANO STATES

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ABSTRACT

The study examined the factors that shape maize farmers' participation in the Farmer Field Business School (FFBS) program in Kaduna and Kano States, Nigeria. A multistage random sampling technique was used to select 496 respondents. Data were collected through the use of structured questionnaires and analyzed using descriptive and inferential statistics. Findings showed that most respondents were male (83.1%), married (86.5%), literate (87.9%), with a mean age of 42 years, and an average farming experience of 20 years. The results of the logit model revealed that years in farming (4.29), mode of land acquisition (1.99), years in cooperative society (3.52), and FFBS awareness ($z = 7.87^{***}$) were significant positive drivers of participation. Conversely, older age (-3.00) and higher education (-2.22) were negative and significant ($P < 0.01$) and ($P < 0.05$) in influencing participation in shaping farmers participation in FFBS programme in the study area. The study recommends that stakeholders strengthen extension services and cooperative networks as strategic entry points for boosting FFBS participation and improving farmer productivity.

Keywords: Extension, Approach, Participation, Farmer, Field, School.

INTRODUCTION

For decades, agricultural development programs built around top-down, expert-driven models have struggled to achieve lasting change in rural communities. Farmers who are handed solutions they had no hand in designing tend to disengage as soon as the project ends. The shift toward participatory, bottom-up approaches—which treat farmers as partners rather than passive recipients—has therefore become one of the more important trends in contemporary extension practice (Ndlovu & Msimanga, 2023; Widodo *et al.*, 2025). Rather than telling farmers what to do, these newer frameworks coach them to identify and solve their own constraints, drawing on local knowledge and community structures.

In Nigeria, agriculture remains the backbone of the rural economy. It accounts for approximately 87% of total rural employment and over 85% of rural income, contributing around 30.77% of GDP in the fourth quarter of 2023 (NBS, 2023). Within the agricultural sector, crop production is the dominant sub-sector, recording a real growth rate of 1.34% year-on-year in Q3 of 2023 (NBS, 2023). Maize is among the leading crops cultivated nationwide—particularly in the Northern Guinea Savanna, which has long been recognised as Nigeria's maize belt due to its favourable combination of rainfall, solar radiation, and low night temperatures (Bello, 2019). Despite this ecological advantage, actual on-farm maize yields remain below two tons per hectare, well short of the agronomic potential achievable by smallholder farmers (Oyinbo *et al.*, 2019; Shehu *et al.*, 2022).

Various extension approaches have been deployed over the years to close this productivity gap—from the National Accelerated Food Production Program (NAFPP) in 1972 to Training and Visit (T&V) extension and the Special Program for Food Security (SPFS)—yet their impact has often been limited by poor farmer involvement in program design (Hamisu *et al.*, 2017). Farmer Field Schools (FFS) emerged as a promising alternative, representing a shift from centralized to decentralized extension delivery. Building on this, the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) upgraded the FFS model to the Farmer Field Business School (FFBS), which combines technical agronomy training under the Good Agronomic Practices (GAP) framework with business and



entrepreneurship skills development (GIZ, 2015; Chilemba & Ragasa, 2020). The program explicitly aims to increase smallholder farmer incomes and productivity, with particular attention to women and youth (GIZ, 2017).

However, the effectiveness of any such program ultimately depends on how many farmers genuinely engage with it—and why. Understanding what drives or discourages participation is therefore not just an academic question; it has direct implications for program design and policy. As Etwire *et al.* (2013) note, the link between farmer participation in agricultural projects and broader outcomes such as poverty reduction and economic development cannot be overstated. Without active farmer involvement, even the most well-resourced program cannot deliver. This study sets out to identify the socioeconomic and institutional factors that influence maize farmers' participation in FFBS in Kaduna and Kano States. Specifically, it seeks to:

- (i) describe the socioeconomic characteristics of maize farmers in the study area; and
- (ii) determine the factors influencing farmers' participation in the FFBS program.

MATERIALS AND METHODS

The Study area

The study was conducted in Kaduna and Kano States, two of Nigeria's most agriculturally significant states in the North-West and North-Central zones. Kaduna is located on the north western part of Nigeria between latitudes 10°31'35.08" N and longitude 7°26'19.64" E of the prime meridian (Kaduna Agricultural Development Agency, KADA, 2018). Kaduna has a land area of over 48,473.2 km² with an arable land of about 2,148,700 hectares km². Kano State on the other hand is located in the north western part of Nigeria. The state lies between latitudes 12°00'0.43" N and longitude 8°31'0.19" E. It has total land area of 21,276.9 Km² of which 1,754,200 km² is cultivable and over 75,000 forest vegetation and grazing land (NAERLS, 2017). The climate in both states are typically wet and dry and crop farming is the major agricultural activities. Both states were structured into agricultural zones (4 in Kaduna; 3 in Kano), with 16 LGAs from each state actively participating in the FFBS program (NBS, 2020).

Sampling Technique and Sample Size

A multistage random sampling procedure was used to select 496 respondents, comprising both FFBS participants and non-participants. First, two (2) agricultural zones were selected purposively from Kaduna and Kano states based on their level of participation in FFBS. Second, three LGAs from each of the selected zones were randomly selected. Third, Yamens (2001) formula was used to select FFBS from each of the LGAs to form the sample frame, fourth, participants were randomly selected from each of the selected FFBS to get the respondents from the participants. Finally, the Yamane (2001) formula was used to select non-participants randomly from the list of registered maize farmers from each of the selected LGAs. The total of the participants and non-participants formed the sample size.

Data Collection and Analysis

Primary data were gathered through structured questionnaires and interview schedules during the 2024/2025 farming season were analysed using descriptive statistic such as frequencies, percentages, means, and standard deviations and inferential statistics (logit regression model)

RESULTS AND DISCUSSION

Socioeconomic Characteristics of Respondents

Table 1 presents the socioeconomic profile of the 496 maize farmers. Maize farming in the study area was predominantly male—83.1% of the pooled sample were men, a pattern consistent with findings by Effiong and Makwin (2021). The mean age of maize farmers was 41 years, suggesting a relatively youthful and economically active farming population. The vast majority (86.5%) were married, which carries practical implications: married households tend to have larger family units (mean household size of 8 persons), providing a ready and reliable labour pool for farm work. As Alabuja *et al.* (2022) observe, this family labour advantage can meaningfully increase maize output.



Educational attainment was notably high, with 87.9% of respondents having completed at least some level of formal schooling—a characteristic that should, in principle, facilitate uptake of new technologies and information. Farming experience averaged 20 years across the pooled sample, with participants reporting slightly more experience (22 years) than non-participants (18 years). Mean farm size was 1.4 ha, and the dominant mode of land acquisition was inheritance, accounting for 70.4% of cases—consistent with patterns documented by other studies in northern Nigeria (Oladehinde & Olayiwola, 2021).

Table 1: Socioeconomic Characteristics of Maize Farmers (n = 496)

Variable	Participants (%)	Non-Participants (%)	Pooled (%)
Sex (Male)	86.9	80.9	83.1
Marital Status (Married)	82.7	89.5	86.5
Mean Age (years)	42	41	41
Literate (any level)	87.0	88.9	87.9
Mean Household Size	8	8	8
Mean Years in Farming	22	18	20
Mean Farm Size (ha)	1.3	1.5	1.4
Land by Inheritance	67.1	73.3	70.4

Source: Field Survey, 2024/2025

Institutional Characteristics of Maize Farmers

On the institutional side, 61.7% of the pooled sample were members of a cooperative society, belonging to an average of two cooperatives. Cooperative membership matters here not just as a social affiliation but as a practical gateway—it connects farmers to extension agents, financial institutions, and market information that would otherwise be difficult to access individually (Effiong & Makwin, 2021). Accordingly, 68.7% of the pooled sample had access to extension agents, with an average of four visits per season.

Awareness of the FFBS program stood at 62.1% across the pooled sample, with near-universal awareness among participants (98%) compared to only 31% of non-participants. One important finding here is that awareness does not automatically translate to participation—only 46.6% of the sample actually participated in FFBS, despite the majority being aware of its existence. This gap between awareness and action points to the importance of understanding the deeper enabling and constraining factors, which the logit analysis below explores.

Table 2: Institutional Characteristics of Maize Farmers (n = 496)

Variable	Participants (%)	Non-Participants (%)	Pooled (%)
Cooperative Member	100.0	28.2	61.7
Mean No. of Cooperatives	2	1	2
Mean Years in Cooperative	7	2	5
Access to Extension Agent	91.3	48.9	68.7
Mean Extension Visits	4	4	4
Access to Credit (Yes)	21.0	17.3	19.2
Aware of FFBS	98.3	31.0	62.1

Source: Field Survey, 2024/2025

Factors Influencing Participation in FFBS

The logit regression model (Pseudo $R^2 = 0.4878$; Wald $\chi^2 = 125.92$; $p < 0.001$) showed strong overall explanatory power. Table 3 presents the marginal effects and significance levels for each variable. Four factors emerged as significant positive drivers of participation, while two carried significant negative associations.

Years in farming (4.29) had the most consistent positive effect, with each additional year of farming experience increasing the probability of participation by 1.58%. More experienced farmers are likely more comfortable engaging with knowledge-intensive programs and better positioned to



appreciate the practical relevance of FFBS training. This aligns with Bello (2020), who found that farmers with greater experience were more open to FFBS participation.

Number of years in cooperative association (3.52) also positively influenced participation, with each additional year in a cooperative raising the participation probability by 1.99%. This finding underscores the role of social embeddedness—farmers who have spent longer in cooperative structures have had more exposure to shared knowledge, peer learning, and contact with extension agents, all of which appear to build familiarity with and openness to programs like FFBS (Adetunji & Adepoju, 2020).

FFBS awareness was the single most powerful predictor of participation (7.87), with a marginal effect of 72.19%. Put simply, farmers who knew about FFBS were dramatically more likely to participate. The mechanism is not just informational—aware farmers are typically those already embedded in cooperative and extension networks, which in turn lowers the barriers to joining the program (Shaibu *et al.*, 2019). Mode of land acquisition (1.99**), particularly inheritance, also had a positive influence, increasing participation probability by 2.82%. Farmers with inherited land may have stronger community ties and longer-term stakes in improving local agricultural outcomes, making them more receptive to structured programs. This contrasts with Jabbar *et al.* (2022), who found tenant farmers more likely to join FFBS due to resource constraints.

Two variables showed unexpected negative associations. Age (−3.00) was negatively associated with participation, confirming the well-documented tendency of older farmers to be more risk-averse and slower to adopt new practices (Ateka *et al.*, 2019). More intriguing is the negative effect of education level (−2.22**), which reduced participation probability—a finding echoed by Amblard *et al.* (2023), who reported an 18.9% decline in engagement among more educated farmers. This may reflect the fact that highly educated farmers have access to multiple information channels and may not perceive FFBS as offering them sufficient marginal benefit over what they already know. Sex, marital status, household size, farm size, and extension access were not statistically significant in this model.

Table 3: Factors Influencing Participation in FFBS (n = 496)

Variable	Marginal Effect (dy/dx)	Z-statistic	p-value
Sex	0.017	0.23	0.816
Age	−0.011	−3.00***	0.003
Marital Status	−0.059	−1.31	0.189
Household Size	−0.001	−0.21	0.831
Education Level	−0.051	−2.22**	0.026
Years in Farming	0.016	4.29***	0.000
Mode of Land Acquisition	0.028	1.99**	0.047
Farm Size	−0.002	−0.09	0.925
Years in Cooperative Assoc.	0.020	3.52***	0.000
Extension Access	−0.070	−0.67	0.503
Awareness of FFBS	0.722	7.87***	0.000
Pseudo R ² = 0.4878	Wald chi ² (11) = 125.92	Prob > chi ² = 0.000	

* p < 0.10; ** p < 0.05; *** p < 0.01

Source: Field Survey, 2024/2025

CONCLUSION AND RECOMMENDATION

This study set out to understand what shapes maize farmers' decision to participate—or not—in the FFBS program in Kaduna and Kano States. The socioeconomic profile that emerges is fairly consistent: participants are predominantly male, married, relatively young, and literate, with about two decades of farming experience and small but productive family-farmed plots. These characteristics are broadly favourable for engaging with knowledge-intensive programs.

The logit regression results tell a clear story: participation is fundamentally driven by social connectivity and program awareness. Farmers who have spent more years in cooperative associations, who have accumulated farming experience, and who are aware of FFBS are significantly more likely to join. This suggests that FFBS is not reaching farmers in isolation—it is traveling through existing



social and institutional networks. Conversely, older and more educated farmers are less likely to participate, signalling that the program may not be adequately tailored to address the concerns of these groups.

On the basis of these findings, the following recommendations are made:

- i. Extension services and cooperative networks should be deliberately strengthened by government, NGOs, and farmer organizations as the primary channels through which FFBS awareness and participation can be scaled up.
- ii. FFBS awareness campaigns should be intensified in communities with low cooperative membership and limited extension coverage, since awareness is the single strongest predictor of participation.
- iii. Program facilitators should develop targeted engagement strategies for older and more educated farmers, who may require stronger evidence of marginal value before committing to the program.
- iv. Future iterations of FFBS should involve participatory needs assessments so that training content is co-designed with farmers, ensuring it speaks directly to the real challenges they face in the field.

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