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Determinants of Farmer-Based Organisations' Sustainability in Peri-urban Tamale, Ghana

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ABSTRACT

This study examines the dynamics and determinants of the sustainability of farmer-based organisations (FBOs) in peri-urban Tamale, Ghana. Using a mixed-methods approach, data were collected from 200 members across 40 FBOs to characterise group structures, identify organisational and membership factors influencing sustainability, and assess perceived impacts of FBOs membership. Descriptive statistics and binary logistic regression were employed for analysis. Results reveal that only one-third of FBOs can be considered sustainable. The key determinants of FBOs sustainability are members' financial commitment, leadership tenure, leadership proactiveness, effective feedback mechanisms, transparent auditing practices, existence of group bank accounts, and gender. Male membership and operating with permanent leadership tenure inhibits the sustainability of FBOs. On the other hand, operating members funded group with a group bank accounts, transparent auditing practices in conjunction with proactive leadership having an effective feedback mechanism, enhances FBOs sustainability. Membership of sustainable FBOs is found to better improve adoption of good agricultural practices (GAPs), credit and markets access, as well as household income and food security. The findings underscore the fact that FBO sustainability is shaped not only by structural and socio-economic factors but also by effective communication processes and participatory governance practices. Policy measures should therefore prioritise strengthening leadership capacity, promoting participatory group models, and investing in enhancements effective communication within groups to enhance the resilience and long-term viability of FBOs.

1. Introduction

Farmer-based organisations (FBOs) and their related institutions are thought to be as old as sedentary agriculture itself. However, the current stream of FBOs emerged from the energy of the United Nations (UN) declaration of 2012 as the International Year of Cooperatives (IYC) and the subsequent adoption of a resolution encouraging stakeholders to raise awareness and promote the formation and growth of FBOs due to their associated benefits, especially in developing countries (Francesconi & Wouterse, 2015). Although FBOs are widely perceived as an institutional response to different economic needs and social constraints of farmers, a variety of factors motivate their formation (Bratton, 1986; Hussein, 2001;

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Fischer & Qaim, 2012). Where FBOs emerge as vibrant entities, they offer opportunities to farmers in the market economy (Abaru et al., 2006).

Agriculture is one of the most significant contributors to the GDP and employment in the Sub-Sahara African subregion, contributing 19-20 percent of the GDP and employing over 45 percent of the total labor force (World Bank, 2025) and essentially necessary to the livelihood of the poorest in the society, who are mostly the smallholder farmers (Wortmann-Kolundzija, 2019). Within this context, FBOs can support agricultural development via building income streams and increasing productivity (Ma & Abdulai, 2016). As such, Verhofstadt and Maertens (2015) called for FBOs membership to be especially inclusive towards less educated, female-headed and poor farmers as they stand to benefit from membership. Hence, FBOs are posited to be key in supporting members in overcoming poverty, food insecurity, and disempowerment by improving the distribution and access to resources, exercising and distributing power, and enhancing the way farmers address the consequences of poverty (Wortmann-Kolundzija, 2019). For African governments, FBOs are thus an effective mechanism for increasing agricultural productivity (Hussein, 2001). But notwithstanding growing public interest, there has long existed evidence that collective action associated with FBOs remains scattered and incomplete, especially in Sub-Saharan Africa (Rondot & Collion, 2001). In other instances, these groups are, in the long run, not viable or capable of rallying the collective power of producers into the decision-making process, often because they are hastily formed without regard for the social, cultural, and economic structures of communities (Abaru et al., 2006).

In Ghana, there has been a growing interest in the establishment and operation of FBOs over the past few decades, resulting in significant interest from the development practitioner and academic communities. Among development practitioner community, the establishment of FBOs allows for ease in the reach of larger numbers of farmers, especially sub-Saharan Africa, where extension officer-to-farmer ratio is approximately 1:1,000 in most countries (Deichmann et al., 2016), with the Ghanaian situation at about one officer to around 1,500 farmers (Ghanaian Times, 2025; graphiconline.com; Ghana News, 2022). The Government of Ghana and its development partners have sought to transform the smallholder agricultural sector over the past few years through collective action. Initiatives such as the formation of FBOs and common interest groups were promoted under the Agricultural Services Sub-Sector Investment Project and the Millennium Challenge Corporation's (Salifu et al., 2010). Other such efforts have been made recently through the German Technical Corporation (GTZ), common interest groups, and innovations, among others. Consequently, in Ghana, over the past decade, there were approximately 10,000 FBOs, comprising 350,000 farm households registered with the Ministry of Food and Agriculture (MoFA).

Farmer-based organizations (FBOs) are not only institutional responses to farmers' economic and social needs, but also communication systems through which farmers engage in dialogue, share knowledge, and co-create solutions. Within the field of development communication, FBOs can be seen as participatory spaces that enhance farmers' voices, foster collective action, and strengthen their bargaining power in agricultural value chains. Development communication emphasises horizontal, inclusive, and dialogical processes rather than top-down information dissemination. As such, the sustainability of FBOs depends not only on organisational and economic factors but also on their ability to establish effective communication networks, build trust, and ensure participatory decision-making

among members (Gerster, 2024; Andrews et al., 2024). For instance, the presence of bylaws, regular meetings, and sanctions illustrates internal communication processes that regulate group cohesion. However, where FBOs are externally initiated without sufficient participatory engagement, sustainability becomes limited. This explains why only about one-third of FBOs in the study area endure. Development communication perspectives thus complement the institutional framework by highlighting the role of effective communication in shaping farmer participation, leadership legitimacy, and group resilience (Lee, 2023).

To gain a deeper understanding of FBOs, several studies have been conducted on various aspects of FBOs in Ghana. These have sought to addressed different aspects of knowledge gap on the FBOs including formation, operations and governance of FBOs (Asante et al., 2011; Francesconi & Wouterse, 2015; Francesconi & Wouterse, 2015a; Bugli, 2018; Dary & Grashuis, 2021; Takyiakwaa et al., 2024; Tortoe & Amo-Awua, 2014), performance of FBOs (Salifu et al., 2013; Salifu et al., 2012), challenges FBOs encounter (Dary & Grashuis, 2021; Takyiakwaa et al., 2024), FBOs impacts on innovation adoption (Addai et al., 2021; Ahmed & Anang, 2019), inputs access (Mohammed et al., 2013), technical efficiency and productivity associated with FBOs membership (Addai et al., 2014; Abdul-Rahaman & Abdulai, 2018; Abdul-Rahaman & Abdulai, 2020; Donkor et al., 2023) and livelihood outcomes of FBOs membership (Abdu et al., 2022; Addai et al., 2024; Karim, 2018; Lasiter & Stawicki, 2012).

However, despite the existence of substantial research exploring different facets of FBOs over the years, with various disciplinary foci, significant gaps remain in our understanding of some critical issues affecting FBOs in Ghana. For instance, there are still gaps in understanding the dynamics of FBOs in Ghana. Additionally, we lack a comprehensive understanding of the key determinants of FBOs' longevity; as such, many FBOs are primarily formed to assess a project's benefits but collapse soon after. Research into understanding the dynamics of FBOs and the determinants of FBOs' sustainability is thus vital, albeit lacking in the literature. It is this light that this study aims to understand the factors influencing the sustainability of FBOs in the Tamale Metropolis. Specifically, the study seeks to characterise FBOs, examine the factors (organisational and membership characteristics) influencing the sustainability and assess member perceptions of the impacts of FBOs.

The rest of the study is organised as follows: immediately following this section, we outline the research approach, detailing the study area, sampling, as well as data collection and analysis approach. Subsequently, we present the results of our analysis, describing the characteristics of the FBOs studied and the individuals sampled from these FBOs, as well as the sustainability of the FBOs and its determinants. Finally, we summarised the results, drew conclusions from them, and identified implications for the sustainability and contribution of FBOs to the overall sustainability of the agricultural and food system through our recommendations.

2. Literature review

Generally, sustainability as an interdisciplinary concept has broadly been used within the concept of sustainable development, where it refers to change that provides for the "needs and aspirations of the present without compromising the ability to meet those of the future" (UN, 1987; Yussif et.al., 2023; Yussif, 2023). However, in this study, sustainability is distinguished based on the FAO's three types: institutional sustainability, economic sustainability, and ecological sustainability (Lütteken & Hagedorn,

1999). On this basis, this study examines sustainability within the context of institutional sustainability, which seeks to understand whether FBOs, as institutions, can continue to exist with their social structures in place, delivering results to their members. To achieve this, the study examined sustainability within the context of three complementary indices - *longevity*, *functionality,* and *performance*. Within these three indices, the measure of longevity is straight forward – it represents the length of time (in years) that FBOs has been in operations. Similarly, functionality is a measure of whether or not the FBOs is actively and continually operating. The measure of performance is however, complex as different studies have different indices for measurement. For instances, Tallam (2018) found that scholars have measured performance of group differently with these broad areas observed – group performance measured by level of cohesion/ group characteristics and group performance measured by outputs/benefits. Salifu et al. (2013) on the order hand measured performance on the basis of collective activities and motivation, characteristics, costs, and benefits of collective activities, as well as leadership and management of collective activities indices. Singh (2023) used revenue generation, annual profit, number of products dealing, percentage of active farmers over total associated farmer, percentage rise in input procurement as well as the number of bod meetings in the measurement of the performance of FBOs. Whiles these are all reasonable measure, they are not suitable for use in especially situations where record kept about FBOs are incomplete and/or unreliable especially among highly illiterate groups like found in the peri-urban Tamale. On this backdrop, this study measures performance within the context of output/benefits, contextualizing it within the umbrella of accomplishment of organisational objectives (i.e., output). Similarly, the use of indices in the measurement of sustainability is not new as a number of other studies in the sub-Sahara African countries (Nangobi et al., 2024; Nji & Engwali, 2019) have implemented different forms of sustainability indices.

3. Methods

3.1 The Study Area

The study was conducted in the peri-urban area of Tamale. Tamale, the capital of the Northern region, has two (i.e., Tamale metropolis and Sagnarigu Municipality) of the sixteen (16) districts of the Northern Region of Ghana. These two districts cover an estimated total of 750 km² and span between latitudes 9°16' and 9°34' North and longitudes 0°36' and 0°57' West. The study area is situated within the savanna climatic zone of Ghana, characterised by two primary seasons: a rainy season (usually between April and October) and a dry season (spanning the remainder of the year) (Ghana Statistical Service [GSS], 2014). Peri-urban land has naturally growing species, such as shea (Vitellaria paradoxa), African locust tree (locally known as dawadawa) (Parkia biglobosa), and baobab (Adansonia spp.), which support agrarian livelihoods (Yussif, 2023).

The population of Tamale is 653,609, according to the 2021 Population and Housing Census. The city is the most populous and rapidly growing urban centre in the northern part of Ghana, and it has continued to experience rapid expansion over the past couple of decades, growing at a rate of more than 4% per annum (Fuseini & Kemp, 2016; Yussif, 2023). Tamale serves as the de facto administrative, economic, commercial, and transportation hub of northeastern Ghana (Nchanji, 2018; Imoru & King, 2018; Yussif, 2023). Due to the city's expansion, agrarian activities and the agricultural sector of the economy and employment have waned in Tamale over time as the town urbanises and agricultural land is lost. As

such, Tamale has some 26.1% of its households engaged in agriculture, with 84.8% of the agrarian households involved in crop farming (GSS, 2014). Consequently, Tamale is situated in one of the severely food-insecure regions of Ghana, with over 30% of its households experiencing food insecurity, accounting for approximately 17% of the total food-insecure households in Ghana. The Tamale Metropolis and the Sagnarigu Municipal areas together have some 28,897 (i.e., 17671 in Tamale Metropolis and 11226 for Sagnarigu Municipal) of their families experiencing food insecurity (Food and Agriculture Organisation [FAO]/Government of Ghana [GoG]/World Food Programme [WFP], 2022). Additionally, the Tamale Metropolis and the Sagnarigu Municipal areas have poverty incidence rates of 24.6% and 29.3%, respectively.

FBOs have been found to have a collective action effect that is vital to the city's peri-urban agricultural livelihoods. The combination of urban expansion-driven agricultural land insecurity and increasing food demand from rapidly expanding cities propels the need to understand the dynamics and sustainability of FBOs in the city's peri-urban agrarian communities, as FBOs have been found to impact innovation adoption, producers' technical efficiency, and land productivity. And as such, it can enable the smaller farming population to better provide for the food needs of the increasingly urban Tamale.

Figure 1. Study Area

Source: Authors, 2024

3.2 Data Collection

The study population consisted of farmers who are members of farmer-based organizations (FBOs) within the greater Tamale area. Data from the Ministry of Food and Agriculture (MoFA) was relied upon for the list of known groups. A multi-stage technique (two-stage sampling) was used to select 200 farmers from these FBOs, from whom primary data was collected. In the first stage, Tamale was selected by predefinition due to the existence of a database of FBOs with varying longevity and functionality. This offers the opportunity to understand the determinants of their sustainability. The sample frame of the research encompasses FBOs that are registered with, or listed in, the records of the Agricultural Development Unit of the Ministry of Food and Agriculture.

In the second stage, with the aid of a list of the registered FBOs together with the contacts and locations, the study identified FBOs that were formed or established at least ten (10) years ago. Effectively, the sample frame for the survey consisted of identifiable FBOs in the records of the Tamale Metropolitan Agriculture Development Unit that were at least 10 years old since their establishment. These identified FBOs are categorized into:

a. Sustainable FBOs (i.e., FBOs that are ten years or older and still active).
b. Non-sustainable FBOs (i.e., FBOs that were established ten years ago but have ceased to exist and function or FBOs that are ten years old but are dormant).

This categorisation provided an opportunity to compare the set of factors that affect the success and long-term survival of the farmer organisation. The population of FBOs qualified for participation were 99. Using the Krejcie and Morgan (1970) table for determining sample size for a finite population, the sample size for this study is 80 FBOs. However, due to resource constraints, the study randomly selected 40 FBOs using a lottery.

For each of the sampled FBOs, two (2) executive members (out of mostly 5) were randomly sampled, and three (3) other ordinary members of the sampled FBOs were also randomly sampled from the group membership list. Therefore, five (5) respondents were selected from each of the chosen FBOs. A total of 200 individual respondents were interviewed, comprising 80 executive members and 120 ordinary members. Quantitative data were collected from the sampled FBO members using a semi-structured questionnaire. The questionnaire focused on key issues related to the dynamics of FBO formation, operation, governance, and factors influencing the sustainability of FBOs. The questionnaire was also piloted on a small sample of 15 respondents. This provided valuable feedback for modifying the design and developing the final questionnaire for the study. It also helped in providing a better understanding of the study group in preparation for the interview. The final questionnaire was administered to FBO members in a face-to-face interview by the authors with the help of trained (and experienced) enumerators.

3.3 Conceptualisation of Sustainability

The dependent variable of the study, FBOs' sustainability, was measured as follows: 1 indicated that the FBO is sustainable, and 0 indicated that the FBO is not sustainable. The dependent variable was constructed from a combination of indices, including functionality, performance, and longevity. The use of index-based measure for sustainability is not new. For instance, in the measurement of the sustainability of farmer producer companies (FPCs), Anand et.al. (2025) indexed sustainability of the FPCs on the perceptions on growth, business planning and outlook, management and governance, value and credibility, brand and promotion and collaboration and innovation whiles Suresh and SS (2024) and Nangobi et al. (2024) indexed sustainability on the basis of a combination of three dimensions: social, economic, and environmental. Suresh and SS (2024) measured factors enabling and inhibiting sustainability using combination of a selection of economic, social, and environmental factors. Whiles Nangobi et al., (2024) measured role of organizational and institutional factors in sustainability of farmer organizations in Uganda.

The independent variables for estimating the determinant of FBOs' sustainability included socio-economic variables, FBO characteristics, and FBO management or leadership practices. The study's conceptual framework is illustrated in Figure 1 below. The concept of sustainability, as described in Section 1 (Background to this study), is assessed and defined by the duration of the farmer organisation's existence in a functioning state, delivering successes to its members. Based on these metrics, the FBOs under survey are categorised as either sustainable or non-sustainable. FBOs that are in existence and are actively operating for at least ten (10) years, with the achievement of at least three key organisational objectives, are described as sustainable. All others, including those FBOs with ten (10) years or more lifespan, but are inactive or are active but perceived to have not achieved formation objectives, are also categorised as non-sustainable FBOs.

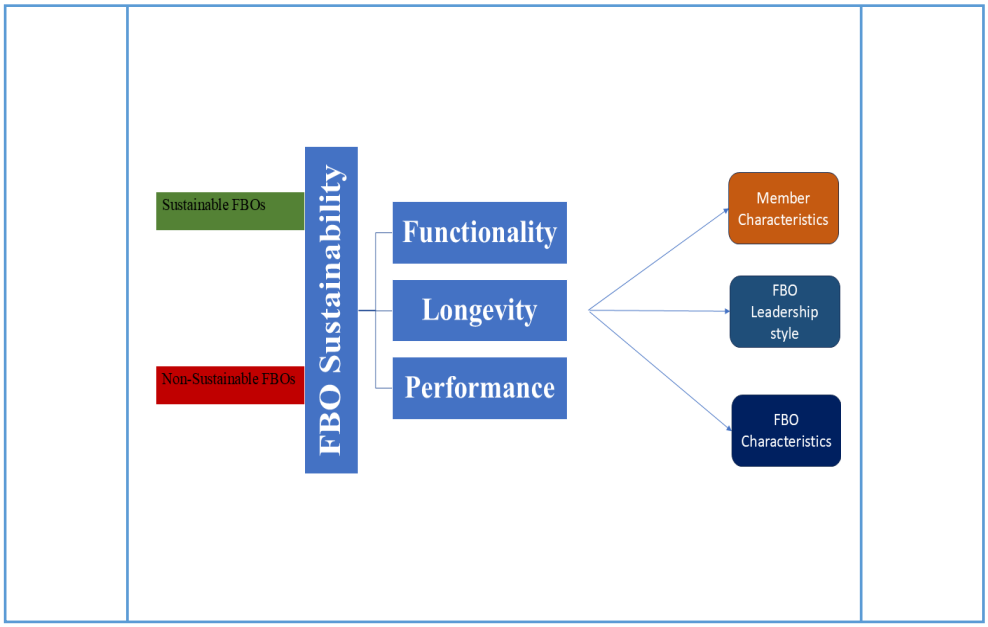

Figure 2. Conceptual Framework

Source: Researcher's construct, (2024)

3.4 Data Analysis

Data were processed using SPSS software version 20 and Microsoft Excel. Responses from open-ended questions in the semi-structured questionnaire were post-coded to ensure uniformity of reactions and to facilitate data analysis. The determinants of FBOs' sustainability were analysed using a binary logistic model.

The dependent variable for the binary logistic model was respondents' perception of the FBOs' sustainability based on the indices mentioned above. The formulation of the questions in the survey allowed for the construction of a limited dependent variable – that is, a dependent variable that has discrete or countable outcomes. As such, this dependent variable could not be analysed with the ordinary regression models. There are two primary forms of these limited dependent variable models for a binary response, as in the case of FBOs' sustainability – the Binary Logistic regression and Binary Probit regression. However, because the study aims to predict the presence or absence of a

characteristic or outcome based on a set of explanatory variables, binary logistic regression is the most suitable approach and was employed in this study.

It was envisaged that FBOs' sustainability may be influenced by factors such as age, gender, exposure to formal education, family/household size, farm size, annual income, experience in farming, access to credit and extension, perceptions of leadership, and group characteristics. The variable specifications are illustrated in Tables 1 and 2, respectively, for the dependent variable and independent variables. The model chosen for the estimation of the relationship between FBOs' Sustainability and the explanatory variables was specified as follows:

$$FBOs\_Sust_i = \beta 0 + \beta 1\, X_1 + \beta 2\, X_2 + \beta 3\, X_3 + \beta 4\, X_4 + \beta 5\, X_5 + \beta 6\, X_6 + \beta 7\, X_7 + \beta 8\, X_8 + \beta 9\, X_9 + \beta 10\, X_{10} + \beta 11\, X_{11} + \beta 12\, X_{12} + \varepsilon_i \quad (5)$$

Table 1. FBO Sustainability Indicators

Variable	Description	Measurement
Functionality of FBO	perception of whether the FBO still actively operating	1 = (functional) if FBO is still actively operating 0 = otherwise (i.e., if FBO is dormant or has collapsed)
Longevity of the FBO	Age of FBOs or the number of years FBOs has been in activity where long-lived FBO is considered to have lived for more than 10years and still operating	1 = (long-lived) if FBO has lived for more than 10years and still operating 0 = Otherwise (i.e., FBO has lived for less 10 years or less or is no longer operating)
Performance of the FBO	Measure of the performance of the FBO as it relates to the number of the FBO's objectives accomplished over time. If a FBO had accomplished at least 3 key objectives are in its operational lifespan, it is considered high performing/success.	1 = If FBO had accomplished at least 3 key objectives are in its operational lifespan) 0 = Otherwise (i.e., FBO had accomplished less than 3 of its key objectives)
Sustainability of FBO	Summation of long-lived, and actively functioning FBO with good performance	1 = if FBO Sustainability score (Greater Longevity + High Success or Performance + Functionality) equals 3, then the FBO is Sustainable. 0 = Otherwise

Source: Authors, 2025

Table 2. Operationalisation of Independent Variables

Key Aspects	Variable	Operationalization of variables
Socio-economic Characteristics	Age	Measured in years
	Gender	1 if farmer is a male, 0 otherwise
	Education	Years of Formal Education
	Household size	Number of people in household
	Farm size	Farmland cultivated, measured in acres

Key Aspects	Variable	Operationalization of variables
	Farming Experience	Number of years the farmer has been in farming
	Income	1=poor (less than GHc1000); 2=middle class (GHc1000 - 5000); 3=rich (more than GHc5000)
	Credit access	1=Had access to credit; 0=Otherwise
	Extension access	1 if farmer has access to extension, 0 otherwise
FBOs Characteristics	Operates a Village Savings and Loan Association (VSLA)	Has a VSLA=1; Otherwise=0
	Initiator for the formation of the FBOs	Members themselves=1; Otherwise=0
	Criterion for selecting (or accepting) FBO members	Common Interest of Group=1; Otherwise=0
	FBO registration	Registered=1; Otherwise=0
	FBO pay membership dues	Pays dues=1; Otherwise=0
	Group bank account	Has bank account=1; Otherwise=0
	Operations of the FBO financed/funded	Members Periodic Contribution=1; Otherwise=0
	feedback mechanism established	Yes=1; Otherwise=0
	Expenditure audit	Audited=1; Otherwise=0
	Training or capacity building training for members	Trained=1; Otherwise=0
	Partnership and credit sources (Linkages with institution e.g. Participation in the MiDA program)	Yes=1; Otherwise=0
	Use of Sanctions and Penalties	Sanctions exist=1; Otherwise=0
FBOs Leadership	How FBO select its leaders	By elections=1; Otherwise=0
	Leadership tenure	Permanent or more than 10 years=1; Otherwise=0
	Leadership styles	Democratic leadership Autocratic Laizze faire
	Proactiveness of the group leaders	Proactive Leader=1; Otherwise=0
	Leader's expertise	Has expertise in 3/more key areas=1; Otherwise=0
	Leadership passion	Passionate Leader=1; Otherwise=0

Source: Authors, 2025

To examine the FBOs members perceptions of the impacts of FBOs on their production, income and food security, a five-point Likert-type scale comprising perceptive statement was used to assess the level of agreement of respondents on an ordinal scale. The response categories on the scale ranged from 5 = Strongly Agree to 1 = Strongly Disagree. Because numbers assigned to Likert-type items express a "greater than" relationship without showing intensity in differences, the recommended statistical analysis include mode for central tendency and frequencies for variability (Boone Jr. & Boone, 2012; Yussif, 2016). This study followed this procedure but in addition, calculated means for each statement to give a central idea of group response and tested responses with t-test to determine whether the difference between the response of two groups (i.e., members from sustainable FBOs and those from non-sustainable FBOs) is statistically significant.

All results were presented using tables and charts.

4. Results and Discussion

4.1 Farmer-Based Organisations Member's Characteristics

Descriptive statistics from a sample of 200 FBO members are presented in Table 3 below. Of the 200 respondents surveyed, 43% were male. The unequal distribution of gender orientation is essentially because females are engaged in agricultural/agribusiness-related groups in northern Ghana, as non-government organisations mostly work with targeted vulnerable females, promoting their organisation into groups. Groups in most rural communities in northern Ghana are also characteristically involved in financial schemes such as VSLA or susu, which motivates mostly women to join to access financial support either within the group or through external support from government organisations (such as the MASLOC, etc.) or non-government organisations.

The mean age of the respondents is 48.6 years, with only 14.5 percent of the respondents falling within the youthful age group of 34 years or younger. It is essential to note, however, that the sample, by design, excluded all individuals under 20 years of age, ensuring that the perception of farmers was based on their extended membership in and experience with FBOs. An additional 14.5% of the sample surveyed were within the aged age group (i.e., people 65years or older). On average, an FBO's member had 1.77 years of formal education; however, as many as 76.5 percent of the members surveyed had never received any formal education at all. This can have implications on information access in an increasingly literate world with an increasingly worsening extension officer-to-farmer ratio (Deichmann et al., 2016; Ghanaian Times, 2025; graphiconline.com; Ghana News, 2022). The surprising contradiction here is that rural areas are often perceived as having low education, yet most of the surveyed respondents are located in the peri-urban regions of Tamale. However, it makes intuitive sense since these areas might have been predominantly rural at the time these respondents were of the school-going age. Only 9.5% of the surveyed population had post-basic education, with just 2.5% having a post-secondary education. In line with the level of schooling observed, only 13% could read, write and understand spoken English (considered literacy in this study). This poor education and literacy record is characteristic of rural agrarian areas and has heavy negative implications on access to innovation. Moreover, the low literacy levels among members (with over 76% lacking formal education) point to the importance of adopting culturally appropriate communication strategies. Oral traditions, local languages, participatory theatre, and radio can serve as vital communication tools for knowledge sharing. Similarly, women's active participation in FBOs reflects how gender-sensitive communication approaches—such as women-led dialogues and peer mentoring—can foster inclusivity and strengthen collective resilience.

On average, a household had 13.3 individuals. The average size of a household is larger than the national average of 3.6 (GSS, 2021). Also, on average, an FBO member has about 18years of farming experience with a household farm size of about 7 acres. However, over 45% of the population surveyed cultivates less than 5 acres (considered smallholder agriculture). The population is essentially smallholder producers. Maize (67%), rice (61%), soybean (43%) and groundnuts (42%) were among the most cultivated crops by the surveyed FBO members.

The mean annual family income among these FBO members was about GH₵12,391.53 with 41.5 percent earning less than a Ghanaian average monthly living income of GH₵ 4,305 reported by Medinaceli et al. (2024). Only 24 percent of the respondents have accessed subsidy for fertilizer. About 68% of the respondents were members of a VSLA group, and as such, overwhelmingly 82% have accessed credit over the past five production seasons, mostly from their VSLAs (69%), relatives/friends (9.5%), commercial banks (3.0%), microfinance (2.5%) and NGOs (1%). On average, the amount of credit accessed is GH₵769.94, ranging from as little as GH₵100.00 to approximately GH₵20,000.00. About 84% of the credit accessed by respondents was less than GH₵1,000.00.

Table 3. Descriptive Summary of FBO Members' Characteristics

Variable	Operationalization of variables	Frequency *(%)*	Mean *(Std Deviation)*
Gender	Male	86 *(43.0)*	0.43 *(0.496)*
	Female	114 *(57.0)*	
Age (in years)	Youth (25 – 34)	29 (14.5)	48.62 *(12.99)*
	Adult (35 – 64)	142 (71.0)	
	Aged (65+)	29 (14.5)	
Formal Education	No formal education	157 (78.5)	1.77 *(3.94)*
	Basic education	24 (12.0)	
	Secondary education	14 (7.0)	
	Tertiary education	5 (2.5)	
Literacy	Neither read or write	164 *(82.0)*	0.165 *(0.372)*
	Read only or write only	10 *(5.0)*	
	Read, write and understand	26 *(13.0)*	
Household size	Large *(more than 8 people)*	143 *(71.5)*	13.31 *(7.17)*
	Average *(5 – 8 people)*	46 *(23.0)*	
	Small *(4 or less people)*	11 *(5.5)*	
Farming Experience	Very Experienced *(12+ years)*	114 *(57.0)*	17.69 *(12.76)*
	Experienced *(5 – 11 years)*	70 *(35.0)*	
	New entrant *(less than 5 years)*	16 *(8.0)*	
Farm Size (acres)	Large scale *(more than 10 acres)*	35 *(17.5)*	6.84 *(8.50)*
	Medium *(5 – 10 acres)*	74 *(37.0)*	
	Smallholder *(less than 2 ha or 5 acres)*	91 *(45.5)*	
Crops cultivated	Maize	134 (67.0)	N/A
	Rice	121 (60.5)	
	Soybean	85 (42.5)	
	Groundnuts	83 (41.5)	
	Yam	20 (10.0)	
	Pepper	20 (10.0)	
	Sorghum	16 (8.0)	
	Cassava	11 (5.5)	
	Okro	2 (1.0)	
	Cowpea	1 (0.5)	
	Sweet potato	1 (0.5)	
	Vegetables (unspecified)	2 (1)	
Access to subsidized fertilizer	Access	48 (24.0)	0.24 (0.428)
	Otherwise	152 (76.0)	

Variable	Operationalization of variables	Frequency *(%)*	Mean *(Std Deviation)*
Income per annum	Rich (more GH$12,000) Medium (GH$4,305 – GH$12,000) Poor (Less than GH₵ 4,305)	32 (16.00) 85 (42.50) 83 (41.50)	*12391.53 (30429.04)*
Membership of VSLA group	Member Otherwise	135 (67.5) 65 (32.5)	0.68 (0.470)
Credit access	Access Otherwise	163 (81.50) 37 (18.50)	0.82 (0.385)
Amount of credit accessed	Large (more than GH$5000) Medium (GH$1000 – 5000) Micro (less than GH$1,000)	3 (1.84) 23 (14.11) 137 (84.05)	*769.94 (2128.07)*
Position/Status in FBO	Chair Secretary/Organizer Financial Secretary or Treasurer Women Commissioner Member	20 (10.0) 34 (17.0) 15 (7.5) 11 (5.5) 120 (60.0)	N/A

Source: Field survey, 2024.

Sample Size (N) = 200; *Monthly living wage GH₵4,305 (Medinaceli* et al., *2024)*

4.2 Characterising Farmer-Based Organisations in the Tamale Metropolis

4.2.1 Group Dynamics

Regarding the gender dynamics of FBOs, the study reveals there were predominantly single-sexed, significantly skewed towards female-only groups. The female-only groups comprised over 45 per cent of FBOs. In contrast, only 19 per cent belonged to male-only FBOs. Single-sexed FBOs thus account for almost two-thirds of the FBOs sampled.

With regards to the motivation for FBO formation, close to two-thirds (i.e., 64.5%) of all FBOs were formed due to external influences. Non-governmental Organisation (NGO) or Civil Society Organisations (CSOs) accounting for 34.5% of these external influences and the Government's MoFA extension agent accounting for 30%. Only 35.5% of FBOs were initiated by the farmers themselves.

Generally, the primary motivation for FBOs' formation was the economic benefits accruing to members. About 82% of respondents indicated they joined their FBOs for expected economic benefits. Similarly, the primary criterion for accepting farmers as members of the FBOs was a common need/interest (82.5%). At the member level, beyond the expected benefit (84.5%), peer influence (15.5%) also contributed to motivating farmers to join an FBO. Regarding the formulation of FBO goals, most FBO goals were based on external projects (e.g., from MoFA, NGOs, CSOs, etc.) objectives (54.0%), but a substantial proportion of FBOs formed their goals participatorily based on the everyday needs of their members (43.5%). Regarding the formalisation of FBOs, registration with a CSO, NGO, MoFA, or the Registrar General is key. For this, 82.5% of FBOs are registered with at least one of these organisations. About 53% of registered FBOs did so for formality and/or credibility, while about 47% registered their group as qualifying criteria for external organisational support services. Still on formality and credibility,

FBOs can formalise their operations and build credibility by establishing rules universally applied to all members, thereby reducing conflict and autonomous actions by members or leaders. Having a bye-law is helpful in this sense. Hence, our assessment of this variable indicates that 96.5% of FBOs implemented by-laws to guide their operations. Within this, the most commonly applied means of dealing with violations of laws/regulations is “Fines” (84.5%). Generally, FBOs meet frequently, with the most established meeting duration being “monthly” (96%). Some other groups meet on a “fortnightly” basis (4.0%).

On the size of the FBOs, most groups were large (78.0%), with an additional 10.5% considered very large. For context, a large group is any group with 20 to 40 members, while a very large group has more than 40 members. Some 7.5% of FBOs could be described as small (i.e., FBOs with three to 10 members). Although these groups were generally large, the operated as primary groups (i.e., groups that involve direct, personal, and intimate relationships) as they participate with each other’s welfare over and beyond group’s primary goals such as attending to communal labour at times, partaking in group members social event like naming ceremonies, weddings, funerals among other social, cultural and religious events. And because they are mainly from the same neighbourhood or small peri-urban community, members often have close daily relationships and emotional ties. Comparing the size of FBOs over time (i.e., to observe whether FBOs have expanded their membership since their establishment), it is found that most FBOs remained the same size (53.5%), while 24.0% had their membership size increase, and 22.5% had their membership size decline.

Regarding the finances of FBOs, the results suggest that FBOs generally have a financial commitment (in the form of dues) to their members. About 70% of respondents stated that their groups have a setup in which members are mandated to pay to remain in good standing. However, only about a third (i.e., 34.5%) of all FBOs members interviewed indicated that their group has a bank account. Notwithstanding, 38.0% of respondents stated that their groups are involved in collective investments. Primarily, financing of FBOs’ operations is done using “Membership Contribution” (88.5%).

Regarding capacity building for FBO members, some 93% of respondents indicated that their FBOs had received some form of training, with 94% of these targeted to all members of the FBOs and 6% targeted solely at FBO group leadership. The subject matter of the training received, 90.5% of attendees indicated that the training they attended focused on educating them on some Good Agricultural Practices (GAPs). Other areas of focus included training on group dynamics and conflict management (52.7%), financial literacy (24.7%), record keeping (33%), and value addition (31.7%).

Regarding the structure of the group, FBOs are generally informal, lacking clear roles, rules, or hierarchies. However, most groups have bylaws and attempt to establish roles, especially for the group leadership. These, however, lack established protocols to be strictly adhered to. The semblance of power structure does not emerge in a rigid structure, as is often the case in formal groups. As indicated, FBO members have a relationship rooted in more flexible, natural interactions among group members. These, however, never prevented some groups from strictly enforcing laid-down by-laws, such as fines for violations of the group's regulations.

Table 4. Dynamic of Farmer-Based Organisations

Variable	Operationalization of variables	Frequency *(%)*
Gender composition of FBOs	1=Male Only	38 (19.0)
	2=Female Only	91 (45.5)
	3=Mixed Sex	71 (35.5)
FBO formed from …. initiative	1=Members	71 (35.5)
	2=Government MoFA Extension	60 (30.0)
	Agent	69 (34.5)
	3=NGO/CSO	
Primary motivation for FBO formation	1=Economic Benefits	161 (80.5)
	2=Social Support Services	39 (19.5)
Primary criterion for selecting FBO members	1=Common Need/Interest	165 (82.5)
	2=Proximity and Relation	28 (14.0)
	3=Constituted for Project	7 (3.5)
FBO registration status	0=no/not registered	35 (17.5)
	1=yes/registered	165 (82.5)
Of the FBO registered, main reason	1=Formality and credibility	87 (52.7)
	2=Qualifying criteria by external	78 (47.3)
	organisation	
Size of Group at formation (Ricardo, 2024)	4=Very Large (more 40)	21 (10.5)
	3=Large (20 - 40 people)	152 (76.0)
	2=Medium (11 - 19 people)	23 (11.5)
	1=Small (three to 10 people)	4 (2.0)
Size of Group currently	4=Very Large (more 40)	21 (10.5)
	3=Large (20 - 40 people)	156 (78)
	2=Medium (11 - 19 people)	8 (4.0)
	1=Small (three to 10 people)	15 (7.5)
FBO size changes over time	3=Increased	48 (24.0)
(Expanded membership size since FBO	2=Remained same	107 (53.5)
establishment)	1=Decreased	45 (22.5)
FBO has a byelaw?	1=Yes	193 (96.5)
	0=No	7 (3.5)
Meetings Frequency currently	4=Weekly	0 (0.0)
	3=Fortnightly	8 (4.0)
	2=Monthly	192 (96.0)
	1=Seasonally/Yearly	0 (0.0)
Meetings Frequency at formation	4=Weekly	12 (6.0)
	3=Fortnightly	147 (73.5)
	2=Monthly	41 (20.5)
	1=Seasonally/Yearly	0 (0.0)
Means of dealing with violation of laws/rules/regulations	3=Expulsion	2 (1.0)
	2=Suspension	17 (8.5)
	1=Fines	169 (84.5)
	0.5=Rebuke/reprimanding	5 (2.5)
	0=None	7 (3.5)

Variable	Operationalization of variables	Frequency *(%)*
Financial commitment (payment of dues)	1=Yes 0=No	140 (70.0) 60 (30.0)
Financing of FBO operations	1=Membership Contribution 2=Membership Levying to cover cost 3=Using Philanthropic donations	177 (88.5) 6 (3.0) 17 (8.5)
Collective investments	1=Yes 0=No	76 (38.0) 124 (62.0)
FBO has a Bank Account	1=Yes 0=No	70 (35.0) 130 (65.0)
FBO received trainings	1=Yes 0=No	181 (90.5) 19 (9.5)
Human Resource Development	1=Yes 0=No	108 (54.0) 92 (46.0)
Established security for member(s) investment?	1=Yes 0=No	61 (30.5) 139 (69.5)
Attracted partners, or credit sources?	1=Yes 0=No	120 (60.0) 80 (40.0)
Attend to private, non-group related occasion of members?	1=Yes 0=No	187 (93.5) 13 (6.5)
Operate a loan or VSLA scheme to support themselves?	1=Yes 0=No	82 (41.0) 118 (59.0)

Source: Field survey, 2024.

Sample Size (N) = 200

4.2.2 Group Leadership

Among other factors, good leadership skills are crucial to the success and sustainability of FBOs (Nji & Engwali, 2019). Following from this, the study assessed FBOs leadership characteristics including leaders' passion (defined based on whether a leader expressed interest, contested and won elections), qualities relied on in the selection of the leader, leadership style, leader's proactiveness, leader's expertise (defined as the number of fields in which the leader is knowledgeable), leadership trainings (determined based on whether FBO or its leader's received leadership and management trainings), as well as the leadership's transparency (i.e., how open and honest leaders are to members) and accountability (i.e., whether leaders are being held responsible for their actions and performance in leading the FBO towards its goals). Table 5 below depicts the results of the survey on leaders' characteristics.

Only about 13% of FBO leaders are passionate and, as such, expressed interest, underwent a contest and won an election to become leaders of their groups. This characteristic low passion level of leaders can negatively impact how they work to promote group cohesion and collective interest. However, considering the qualities that influence the choice of leaders, it is reasonable to say that most leaders were fit for purpose. About 90% of FBOs considered experience when choosing individuals to lead.

Additionally, more than half (i.e., 61.5%) considered individuals for leadership due to their role in forming the group. Other qualities included individual status in society (38%), educational qualification (33%), age of the individual (23.5%), integrity of the individual (19%), and commitment to work (9%). On the leadership style of FBOs leaders, over three-quarters of the group, according to interviewees, employed democratic leadership (i.e., 79.5%). Autocratic leadership accounted for 14.5% and laissez-faire had 6%.

The study also found that about 42% of respondents considered their leaders proactive. Also, on the expertise of group leaders, about 83% of the respondents perceived their leader to have expertise with 39.5% indicating their leaders had expertise in three (3) or more key areas whiles the remaining 43% had expertise in less than three key areas (i.e., *Communication, Decision-making, Intrinsic motivation, Team Building, Organizational, Critical thinking*). Regarding whether their group received leadership and/or management training, just over a third (34.5%) of respondents indicated that their group had management/leadership training. Of those who indicated that their group had received management/leadership training, 84.1% stated that the training was offered to all members regardless of their leadership status. In comparison, the remaining 15.9% indicated that the training was targeted solely at leaders within their group. In general, approximately 88% of the respondents reported having received training through their group. These trainings ranged from Good Agricultural Practices (84%), Group Dynamics (45%), Financial Management (23%), Record Keeping (21%), and Value Addition (14.5%).

Regarding transparency and accountability, 68% of respondents considered their leaders transparent, and 46% considered them accountable to the group.

Table 5. Farmer-Based Organisations (FBOs) Leadership Characteristics

Variable	Operationalization of variables	Frequency *(%)*
Selection of Leaders	Election	**40 (20.0)**
	Consensus	**120 (60.0)**
	Imposition/Recommendation	**40 (20.0)**
Tenure of leaders	Short term (1 – 2 years)	**24 (12.0)**
	Medium term (3 – 6 years)	**25 (12.5)**
	Long term (6 – 10 years)	**36 (18.0)**
	Permanent	**116 (58.0)**
Leadership passion (Passionate if leader expressed interest, contested and won elections)	1= passionate	40 (20.0)
	0=not passionate	160 (80.0)
Qualities used for selecting leader	Experience	179 (89.5)
	Role in FBO formation	123 (61.5)
	Status in society	76 (38.0)
	Educational qualification	66 (33.0)
	Age	47 (23.5)
	Integrity	38 (19.0)
	Commitment	18 (9.0)
	Passion	14 (7.0)
	Human relations	13 (6.5)
	Patience	7 3.5)

Variable	Operationalization of variables	Frequency *(%)*
	Sense of responsibility	6 (3.0)
	Honesty	4 (2.0)
	Humility	4 (2.0)
Leadership style	Autocratic	22 (11.0)
	Democratic	160 (80.0)
	Laissez-faire	18 (9.0)
Level of proactiveness of the leader (Proactive, if leader does not wait to be prompted to take actions in the interest of group)	Proactive	110 (55.0)
	Not Proactive	90 (45.0)
Leader's expertise (Number of fields in which the leader is knowledgeable; *Communication, Decision-making, Intrinsic motivation, Team Building, Organizational, Critical thinking*)	2=expertise in 3/more key areas	79 (39.5)
	1=expertise in 1-3 key areas	86 (43.0)
	0=No expertise at all	35 (17.5)
FBO had a Leadership/Management training	1=Yes	69 (34.5)
	0=No	131 (65.5)
Any training at all?	1=Yes	175 (87.5)
	0=No	25 (12.5)
Kind of training provided FBO	Good Agricultural Practices	168 (84.0)
	Group Dynamics	98 (45.0)
	Financial Management	46 (23.0)
	Farm Record keeping	42 (21.0)
	Value Addition	29 (14.5)
Leaderships' transparency	0=Not transparent	64 (32.0)
	1=Transparent	136 (68.0)
Leaderships accountability	0=Not accountable	108 (54.0)
	1=Accountable	92 (46.0)
Leader's effectiveness in pursuing FBO's goal	Effective	131 (65.5)
	Otherwise	69 (34.5)
Feedback mechanism exists	Yes	132 (66.0)
	No	68 (34.0)
Leadership expenses on behalf of the group audited	Yes	79 (39.5)
	No	121 (60.5)

Source: Field survey, 2024.

Sample Size (N) = 200

4.3 Sustainability of Farmer-Based Organisations and its Determinants

4.3.1 Sustainability of Farmer-Based Organisations

As already indicated (under the introduction section), sustainability in this study refers to the sustainability of institutions (i.e., the FBOs). Within this context, sustainability concerns the FBO's institutional capacity to continue to promote the institution's existence and to deliver results. Hence, the study applied the above three complementary metrics to assess the sustainability of FBOs. Table 6 below presents the survey results on the sustainability of FBOs. According to this assessment, approximately 69% of FBO members interviewed considered their organisation to be functional, 58%

were believed to have been in existence for a long time, and 53% were considered successful. Cumulatively, close to a quarter of (i.e., 32.5%) of the FBOs were deemed to be sustainable. From literature, it is intuitive to state that sustainability of FBOs in the Sub-Sahara Africa relatively poor because similar low sustainability index results (i.e., about 36%) were found in Ugandan farmer organizations study by Nangobi et al. (2024).

Table 6. FBO Sustainability Indicators

Variable	Operationalization of variables	Mean	Std. Dev.
Functionality of FBO (Is the FBO still actively operating?)	1= (functional) if FBO is still actively operating 0=otherwise (i.e., if FBO is dormant or has collapsed)	0.685	*0.467*
Longevity of the FBO (**I9.** Age of FBO OR No. of years FBO has been in activity)	1 = (long-lived) if FBO has lived for more than 10years and still operating 0=Otherwise (i.e., FBO has lived for less 10 years or less or is no longer operating)	0.580	*0.495*
Success/performance of the FBO (**F1.** No. of FBO's objectives accomplished)	1=If FBO had accomplished at least 3 key objectives are in its operational lifespan) 0= Otherwise (i.e., FBO had accomplished less than 3 of its key objectives)	0.530	*0.500*
FBO Sustainability	1=if FBO Sustainability score (Greater Longevity + High Success or Performance + Functionality) equals 3, then the FBO is Sustainable; 0=Otherwise	0.325	*0.470*
FBOs Sustainability = **Greater Longevity + High Success or Performance + Functionality**			

Source: Field survey, 2024.

Sample Size (N) = 200

4.3.2 Factors Influencing the Sustainability of Farmer-Based Organisations

The study examined some potential practical problems that can arise in regression analysis, including missing observations, multicollinearity, and outliers (Greene, 2003). Subsequently, the study excluded variables with missing observations from the model. Multicollinearity in a dataset occurs when there is a linear relationship among independent variables (Gujarati, 2004; Yussif et al., 2017). The existence of this relationship can be determined via a linear correlation analysis. Hence, this study conducted a correlation analysis for the explanatory variables. Following this analysis, all highly correlated explanatory variables were treated as indicated by Maddala (1992) as cited by Yussif (2016). This is necessary because the influence of a single explanatory variable on the dependent variable becomes difficult to isolate if two highly correlated independent variables are included in a model (Maddala, 1992). As correlation is always present in data, multicollinearity is considered a problem when the

correlation coefficient is greater than or equal to 0.8 (Gujarati, 2006; Yussif, 2016). Drawing from this, the model excluded any two explanatory variables with a correlation coefficient of approximately 0.8.

The logistic regression was performed to ascertain the effects of gender, age, lack of formal education, farm size, credit access, FBO registration status, FBO Financing Mechanism, FBO Leaders' Tenure, FBO Leaders' Proactiveness, Effective Leadership, Feedback Mechanism existence, and Audited Leadership Expenditure among others (see Table 4.6) on the likelihood that FBOs they belong to is sustainable.

The logistic regression model was statistically significant, $\chi^2(17) = 217.041$, $p < .000$. The model explained 92.4% (Nagelkerke R^2) of the variance in FBO Sustainability and correctly classified 96.5% of cases. From these results it is found that gender ($p = .036$), FBO self-financing mechanism ($p = .096$), leaders' tenure ($p = .006$), leaders' proactiveness ($p = .001$), effective leadership ($p = .003$), feedback mechanism ($p = .014$), and audited leadership expenditure ($p = .005$) added significantly to the model/prediction, all other variables did not. One of the most significant determinants of FBO sustainability identified in this study is the existence of an effective feedback mechanism. This finding ($p = .014$) underscores the central role of internal communication systems in shaping organisational (FBO) resilience and longevity. Feedback mechanisms function as the primary channels through which information flows between leadership and members, enabling collective learning, accountability, and adaptive decision-making. In the context of FBOs, feedback mechanisms include regular meetings, open financial reporting, opportunities for members to question leadership decisions, and structured avenues for grievance redress. These mechanisms are not merely procedural; they constitute the organisation's communication infrastructure. Where such systems exist, members are more likely to trust leadership, remain financially committed, and actively participate in group activities—all of which are critical to sustainability. The strong positive effect of feedback mechanisms on sustainability suggests that information asymmetry and communication breakdowns are key drivers of organisational collapse. Without feedback, members may perceive themselves as excluded from decision-making processes, leading to disengagement, reduced contributions, and eventual dormancy of the group. Conversely, effective feedback loops enhance transparency, reinforce social cohesion, and strengthen members' sense of ownership over the organisation.

Table 6 further shows that the odds of FBOs sustainability are 0.004 times lower for males than for females. It also indicates that the odds of FBOs sustainability are more than 1283 times higher when FBO operations are financed by members' contributions rather than by donations and philanthropic sources. Similarly, the odds of FBOs sustainability increase by more than 1481 times when the FBOs has a leader perceived as acting proactively in the group's interest, compared with leaders who need to be prompted to act. In the same vein, the perception of effective leadership, the existence of a feedback mechanism, and periodic audits of leaders' operational expenses increase the odds of FBOs sustainability by over 47, 196, and 218 times, respectively. On the contrary, having permanent leaders of the FBOs decreases the odds of FBOs sustainability by 0.008 times.

Overall, the results from this study are not completely at odds with works on the sustainability of farmer organisations in other countries within sub-Saharan Africa and across the developing world. For instance, in Uganda, Nangobi et al. (2024) found that internal financial dependence and leadership committee size, a function of leadership effectiveness, are key determinants of FBOs' sustainability in Uganda. Also, the incomes and capital of individual members, which may affect willingness to fund an

FBOs internally, have been found by Suresh and SS (2024) to influence the sustainability of FBOs. From a development communication perspective, the sustainability of FBOs can be understood as a governance and communication outcome: effective information exchange, coupled with transparent feedback, will help build trust and willingness to commit to the group's efforts and actions. On the other hand, weak communication structures often result in mistrust, dependency on external actors, and eventual collapse of organizations.

Table 7. Logit Model Estimates of Factors Determining FBOs Sustainability Indicators

Variable	B	S. E.	Wald	df	Sig.	Exp(B)	95% C.I. for EXP(B)	
							Lower	Upper
Gender (1)	-5.619	2.674	4.414	1	**.036**	**.004**	.000	.686
Age	-.066	.078	.724	1	**.395**	**.936**	.803	1.090
No formal Education (1)	-2.067	1.623	1.621	1	**.203**	**.127**	.005	3.049
Farm Size	-.070	.155	.204	1	**.651**	**.932**	.688	1.263
Credit Access (1)	-1.155	2.085	.307	1	**.580**	**.315**	.005	18.750
FBO Formation Initiator (1)	1.042	1.139	.836	1	**.360**	**2.833**	.304	26.406
Registered FBO (1)	1.058	1.507	.494	1	**.482**	**2.882**	.150	55.215
Periodic Membership Dues (1)	-1.928	1.280	2.268	1	**.132**	**.145**	.012	1.788
Financing via Members Contribution (1)	7.157	4.304	2.766	1	**.096**	**1283.424**	.279	5910130.629
Leader Selection via Election (1)	2.893	2.027	2.036	1	**.154**	**18.046**	.339	959.355
Permanent Tenure of Leaders (1)	-4.801	1.759	7.451	1	**.006**	**.008**	.000	.258
Proactive Leadership (1)	7.300	2.210	10.909	1	**.001**	**1481.016**	19.459	112719.591
Effective Leadership (1)	3.859	1.305	8.744	1	**.003**	**47.412**	3.673	611.939
Existence of Feedback Mechanism (1)	5.280	2.139	6.094	1	**.014**	**196.320**	2.967	12988.124
Ownership of Group Bank Account (1)	2.769	1.754	2.494	1	**.114**	**15.947**	.513	495.951
Audited Leadership Expenditure (1)	5.386	1.924	7.832	1	**.005**	**218.306**	5.023	9488.463
FBO engaged in VSLA (1)	2.977	1.986	2.246	1	**.134**	**19.628**	.400	962.989
Constant	-16.850	6.481	6.760	1	.009	.000		

a. **Variable(s) entered on step 1:** *Gender, Age, No Formal Education, Farm Size, Credit Access, FBOs Formation Initiator, Registered FBOs, Periodic Membership Dues, Financing via Members Contribution, Leader Selection via Election, Permanent Tenureship of Leaders, Proactive Leadership, Effective Leadership, Existence Feedback Mechanism, Bank Account, Audited Leadership Expenditure, FBO VSLA Scheme.*

4.4 Perception of Impact of Farmer-Based Organisations

Respondents' perceptions of the impact of the FBOs are vital to understanding why they will stay with FBOs (or otherwise). This study, therefore, examined FBOs members' perceptions of the impact on them. Perception statements were read aloud and explained to respondents to ensure appropriate responses. The means of each statement were computed, and comparisons of means were made between sustainable and non-sustainable FBOs. The differences in means were statistically tested to determine whether they were significant. This is shown in Table 8. For perception regarding the impact of FBOs on adoption of good agricultural practices (GAPs), about 92 per cent of the FBOs members generally perceived improvement in the adoption of Good Agricultural Practices (GAPs) because of their membership with FBOs (Mean = 4.75; Std. Dev. = 0.657). However, respondents from Sustainable FBOs perceived greater improvement in the adoption of GAPs than those from non-sustainable FBOs (i.e., mean difference = ***0.241;*** significant at p = ***0.015***). The survey results also revealed that members of FBOs generally agreed with the statement that "membership of FBOs has led to improved access to agricultural inputs" (Mean = 3.60; Std. Dev = 1.126). However, no significant differences were observed in the perception of members of Sustainable FBOs compared to those of non-sustainable FBOs.

For the case of the statement on ''membership of FBOs has led to improved access to agricultural machinery services (such as tractors and harvesters)'', it was generally observed that respondents are indifferent about the impact, and this indifference was not observed to have a significant difference between the perception of members of Sustainable FBOs and those from non-sustainable FBOs. Regarding the impact of FBOs membership on access to agricultural extension services, FBOs members generally agree that their membership has helped improve access; however, no significant difference was observed between the perceptions of members of Sustainable FBOs and those of members of non-sustainable FBOs. In the case of perception on ''Membership of FBOs has led to improved access to credit services'', the result of the survey suggests that members of FBOs generally agreed with the statement (Mean = 4.21; Std. Dev = 1.034). It is further recommended that there exists a significant difference between the perception of members of Sustainable FBOs (Mean = 4.54; Std. Dev = 0.812) from those of non-sustainable FBOs (Mean = 4.04; Std. Dev = 1.092) by a mean difference of 0.494, which was significant at 1%. For the case of the statement on ''membership of FBO has led to improved farm yield'', it was generally observed that respondents agreed that membership produced improvement in farm yields. Still, there was no significant difference between the perception of members of Sustainable FBOs and those of non-sustainable FBOs.

Regarding market access, respondents generally agreed that membership led to improvements. Still, there was a significant difference (i.e., by a margin of 0.378, significant at 5%) between the perception of members of Sustainable FBOs (Mean = 4.62; Std. Dev = 0.860) and those of non-sustainable FBOs (Mean = 4.24; Std. Dev = 0.994).

Finally, regarding FBO members' perceptions of the impact of their membership on their household income and food security, farmers generally strongly agreed that FBO membership improved their household income, but were undecided about whether it improved their household food security. However, in both instances, there were statistically significant differences between the perception of members of Sustainable FBOs and those from non-sustainable FBOs (i.e., by a margin of 0.480,

significant at 1% for the case of household income and by a margin of 0.834, significant at 1% for the case of household food security).

The impacts observed in this study are comparable to those reported in other studies in Ghana. For instance, Shiferaw et al. (2011) found that the characteristics associated with sustainable FBOs enhance improved market access in these groups. FBOs' membership generally improves the adoption of innovations such as farm machinery and row planting in the Upper East region of Ghana (Addai et al., 2021). Still on the adoption of technology, FBOs' membership was found to positively affect the number of soil conservation practices adopted on the farm (Wollni et al., 2009). On the contrary, the results of Ahmed and Anang (2019) study indicate that membership in FBOs leads to lower adoption of improved maize varieties. However, they admit this outcome is contrary to the generally held view that membership in FBOs is positively associated with farmers' adoption of innovation. Other studies that found a relationship similar to this one include Jabbar et al. (2025) and Addai et al. (2024). On their part, Jabbar et al. (2025) found that participation in FBOs improves the Food Consumption Score, promotes livelihood diversification, and enhances access to credit. Addai et al. (2024) on the other hand, found that participation in FBOs increases household dietary diversity and thus reduces food insecurity, a result similar to that of Otitoju and Olaiya (2024) who found that membership in FBOs positively influences food security in Nigeria.

Table 7. Distribution of Responses to Perceived Impacts of FBOs

Statement	Sustainable FBOs (n=65)	Non-Sustainable FBOs (n=135)	*Mean diff.*	Pooled
Membership of FBO has led to improved adoption of **good agricultural practices (GAPs)**	4.91	4.67	**0.241****	4.75
Membership of FBO has led to improved **agricultural inputs (such as seeds, fertilizers) access**	3.63	3.58	0.053	3.60
Membership of FBO has led to improved **agricultural machinery (such as tractors and harvesters) services access**	2.82	2.79	0.030	2.80
Membership of FBO has led to improved **agricultural extension service access**	4.00	4.15	-0.148	4.10
Membership of FBO has led to improved **credit service access**	4.54	4.04	**0.494*****	4.21
Membership of FBO has led to improved farm **yield**	3.98	4.05	-0.067	4.03
Membership of FBO has led to improved **market access**	4.62	4.24	**0.378****	4.36
Membership of FBO has led to improved **household income**	4.97	4.49	**0.480*****	4.65
Membership of FBO has led to improved household **food security**	4.92	4.09	**0.834*****	4.36

Source: Field survey, 2024.

Sample Size (N) = 200 Likert Scale: *5 = Strongly Agree, 4 = Agree, 3 = Undecided, 2 = Disagree and 1 = Strongly Disagree* *p < 0.10; **p < 0.05; ***p < 0.01

5. Conclusions and Implications

These study findings offer insights to support the sustainability of FBOs and their potential to scale benefits associated with farmers' collective action in peri-urban and rural areas of Northern Ghana, leading to positive productivity and livelihood outcomes.

This study provides empirical evidence to bridge the knowledge gap on the sustainability of FBOs in peri-urban Tamale. While FBOs are increasingly organised and formalised, only about one in three remain sustainable, raising concerns about their reliability as long-term vehicles for smallholder organizing, empowerment and productivity enhancement. The analysis reveals that sustainability is closely linked with leadership qualities—particularly proactiveness, effectiveness and non-permanence of tenure—alongside the adoption of governance systems such as transparent feedback mechanisms, operation of a group bank account, audited financial management systems and self-funded operation of the FBOs. Gender, appear to be the key sociodemographic factor that influences FBOs sustainability where female membership is found to be a strong enabler of sustainability. Notably, the study reveals that communication processes—such as feedback which is essential for trust-building, and participatory decision-making—are crucial to sustaining FBOs, thereby reinforcing the argument that development communication is not peripheral but foundational to the survival of these organisations. Incorporating a development communication perspective demonstrates that the sustainability of FBOs is not only a matter of institutional structures or economic viability, but equally a function of how effectively members communicate, participate, and build trust. Stronger communication processes enhance the adoption of innovation, gender inclusion, and long-term resilience, positioning FBOs as both economic and communicative institutions for rural development. Perceptions of impact further highlight that sustainable FBOs are better positioned to enhance the adoption of good agricultural practices, improve access to credit and markets, and strengthen household food security. These findings emphasise the need for targeted policy interventions that build communication and leadership capacity, institutionalise gender-sensitive participation, and provide supportive infrastructure for collective action. Strengthening FBOs in this manner will not only consolidate their role as vital institutions in agricultural development but also contribute to broader goals of reducing rural poverty, ensuring food security, and enhancing community resilience.

Based on the study's findings and insights, several policy-relevant conclusions can be drawn. These are:

i. FBOs are increasingly getting organised and formal in their operation; as such, a fertile institutional environment for growth and performance exists for these organisations to be sustained and expand to cooperatives and other bigger common interest groups to reap the benefits of economies of scale in the access to inputs and services for production, as well as negotiation for favourable output markets.
ii. The sustainability of FBOs remains very limited. Approximately one in three FBOs is sustainable, raising concerns about the long-term viability of relying on these institutions to provide the associated benefits to agrarian producers. With increasingly liberal agricultural markets and limited government participation in agriculture, it is doubtful if these organisations could offer an alternative to smallholders.
iii. FBOs have a better chance at sustainability with members who are women ready to finance the groups using their own contributions. But the most critical determinants of sustainable FBOs are in

their leadership. Specifically, FBOs would be largely sustainable with non-permanent leadership tenure and proactive, effective leaders. FBOs that have a bank account, a mechanism for feedback and an audit for leaders have an even better chance of sustainability.

iv. Impact perception may be a contributor to the sustainability of FBOs, as this is found to vary significantly between sustainable FBOs and non-sustainable FBOs, especially in areas such as improvement in the adoption of good agricultural practices (GAPs), improvement in access to credit and market, as well as improved household income and food security.

From the conclusions drawn, the following are important implications of the study for policy and future research.

To the extent that FBOs are highly unsustainable in peri-urban Tamale and, by extension, in northern Ghana, where government and non-government efforts to organise, farmers are primarily evident, a new direction for smallholder farmer group organisations' self-emergence is encouraged. NGOs have made huge strides in organising rural audiences for projects; these have created a large population of project-initiated and directed groups who turn out to be unwilling, incapable, and unprepared to govern their organisations, leading to many of them collapsing or becoming dormant upon project completion. With the findings clearly depicting the place of leadership and self-directed organisational characteristics, such as self-funding, feedback and auditing, in the sustainability of FBOs, it is expected that future efforts should mainstream these essential characteristics information, registration and project implementation with FBOs to promote their sustainability.

Also, given that sustainable FBO membership found to promote better adoption of GAPs, access to credit and market as well as household income and food security, the sector ministry and development partners should make efforts to encourage and implement the characteristics found to enhance sustainability of FBOs as this bolster the number of households joining the pathway improved income and food security thereby increasing our chances at achieving sustainable development goals (SDGs) 1 on poverty alleviation and 2 on zero hunger. To achieve these, the following specific efforts and recommendations are proposed.

1. Building Organisational Communication Capacity of FBOs: Training programs for FBO leaders should go beyond technical skills to include facilitation, dialogue, conflict management, and participatory planning. With these, leaders can eliminate misunderstanding, build trust and enhance group cohesion, an essential element for sustainability. Communication efforts should include investments in local radio, ICT platforms, and farmer-to-farmer learning networks, which can enhance collective action and support the sustainability of FBOs.

2. Improved Female-Inclusion in FBOs and FBOs' Governance: Generally, groups should consciously include females, as the results indicate they are vital enablers of FBOs' sustainability. Females should also be included in the leadership of FBOs, especially in terms of organizing, as they may be better skilled in these from their nurtured experience from homes. Communication strategies should also explicitly integrate gender inclusivity to amplify women's voices in decision-making spaces.

3. Re-structure financial support services for FBO governance and operations: Organisations seeking to support budding FBOs should restrict their funding to capacity building, innovation promotion,

and structure and process enhancements. Financing for FBO operations needs to be offloaded to members, as this builds commitment and accountability among members. These are traits FBOs need for sustainability.

Although the study employed a scientific approach to understanding the sustainability of FBOs in Ghana, it had several limitations. These include (a) the nature of the measurement of sustainability, (b) the geographic scope of the study, and (c) the time horizon within which the study is conducted.

Regarding (a), there are several approaches to measuring sustainability. This study examined institutional sustainability using three complementary indices – longevity, functionality, and performance. These approaches present their own limitations and a used of different context (such as economic sustainability, and ecological sustainability) or indices may lead in a different sustainability outcome and hence the results of the study.

Regarding (b), the study is limited to the peri-urban area of Tamale. An expansion of this study to include other peri-urban communities across Ghana or expansion to include rural farming communities may lead to a different result. The limitation to only peri-urban Tamale thus limits the study's generalizability.

Regarding (c), the study could have been conducted cross-sectionally, longitudinally or both. We employed only a cross-sectional approach. The use of a cross-sectional time horizon in examining FBOs' sustainability limits our ability to identify and understand how specific FBOs' sustainability (or its determinants) change and/or develop over time. Given these stated limitations, future studies should expand the scope and, where possible, integrate panel sustainability data and objective economic and/or ecological audits into the measurement and analysis of FBO sustainability.

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