

Determinants of Participation in Rotational Savings Schemes on Input Investment Among Oil Palm Farmers in Widikum Subdivision

Peter Ngek Shillie¹; William Shu Neba²; Roxiana Ayang Dimbang³ and Puis, Tangwe Tanga⁴

¹Department of Agribusiness Technology, College of Technology, University of Bamenda, Cameroon.
<https://orcid.org/0000-0002-0043-7806>

²Post Doctoral Research Fellow, Department of Social Work, University of Fort Hare, Alice Campus, South Africa
<https://orcid.org/0009-0002-4844-9467>

³Department of Agribusiness Technology, College of Technology, University of Bamenda, Cameroon
<https://orcid.org/0009-0002-5462-8525>

⁴Department of Social Work, University of Fort Hare, Alice Campus, South Africa
<https://orcid.org/0000-0003-1359-8729>

DOI: 10.46609/IJSSER.2025.v10i01.003 URL: <https://doi.org/10.46609/IJSSER.2025.v10i01.003>

Received: 9 Nov. 2024 / Accepted: 10 Jan. 2025 / Published: 25 Jan. 2025

ABSTRACT

This study examines determinants of participation in Rotational Savings Schemes on input investments among oil palm farmers in Widikum Subdivision. A stratified random sampling was used to select 225 participants. Primary data was collected using structured questionnaires. Resilient Ordinary Least Squares regression analysis was employed for inferential statistics. The results revealed that financial support with a p-value of (0.012), money-saving (0.132), and financial risk management (0.003) had statistically significant negative effects on input investments, while factors like credit availability with a p-value of (0.185), social connections (0.132), and information sharing (0.209) showed non-significant effects. Conclusively, financial support plays a crucial role in improving farmers' capacity to invest in inputs, but it also has the unintended consequence of reducing personal investment. This substitution effect suggests a need for balanced financial support that encourages both external and personal investments.

Keywords: Farmer, Input Investments, Njangi Groups, Oil Palm, Rotational Savings.

1. Introduction

Low-income populations face many agricultural challenges in the global south. These challenges are further aggravated by the absence of formal financial institutions (Ojong, 2019) capable of protecting against agrarian challenges. Oil palm farmers have developed strategies to combat the difficulties in palm oil production through the creation of “*njangi*” groups. From time immemorial, “*njangi*” groups, also known as “tontine”, in different cultural contexts, are informal rotating savings and credit associations (ROSCAs) (Lehmann and Smets, 2020), that have been prevalent in various societies across the globe. Participation in “*njangi*” groups can positively influence farmers' decisions to invest in agricultural inputs, such as fertilizers and pesticides (Nchanji *et al.*, 2024), and improved seeds (Tambi, 2023). This is because membership in “*njangi*” groups provides farmers with a reliable source of financial support and a platform for sharing agricultural knowledge and resources.

In Sub-Saharan Africa (SSA), “*njangi*” groups have evolved in response to changing socio-economic circumstances, including urbanization and globalization. According to Ndlovu-Gatsheni, (2019) despite the disruptions in socio-economic systems associated with colonisation, the traditional practice of “*njangi*” groups persisted as a resilient institution for social and financial solidarity. “*Njangi*” groups have played a vital role in bridging the financial gaps (Wabit, 2018; Nkwocha, 2019), particularly in rural and marginalized communities where access to banking institutions is limited. Apparently, “*njangi*” groups act as a platform where members combine resources for a common economic pursuit. Moreover, “*njangi*” groups play a vital role as agents of economic empowerment and development, as seen in their ability to facilitate access to credit for small-scale entrepreneurs and farmers (Nsamenang, 2014; Dabić *et al.*, 2022). These groups typically consist of a small, close-knit community of individuals who come together to pool their financial resources for collective benefit. The groups operate on a principle of trust, mutual support, and reciprocity (Stavropoulou *et al.*, 2017), where members contribute to and benefit from the collective savings pot.

In Cameroon “*njangi*” groups are seen as a mechanism for financial inclusion (Wiykiynyuy and Fozoudine, 2021), and social support. The existence of “*njangi*” groups in the country is guided by Law No .90/053 of 19 December 1990 (Tamasang, 2021), relating to freedom of association. These groups provide a vital lifeline (Ngoasong, 2023) for individuals facing economic hardship, offering access to credit for essential needs such as education, healthcare (Ndumbe, *et al.*, 2009), and agricultural inputs. Moreover, “*njangi*” groups serve as platforms for social interaction and solidarity (Momasoh, 2023), strengthening bonds within communities and fostering a sense of collective responsibility (Ngwane, 2012). Despite their widespread prevalence and socio-economic importance, “*njangi*” groups in Cameroon face numerous challenges, including issues of governance, sustainability, and scalability (Jumfongai *et al.*, 2022).

The informal nature of “*njangi*” groups leaves them vulnerable to mismanagement and exploitation, particularly in cases where there is a lack of transparency and accountability (Dube, 2018) among members. Additionally, the incapacity of “*njangi*” groups to mobilize large-scale capital in Widikum Subdivision by oil palm farmers hampers their potential impact on poverty alleviation and economic development. Oil palm farmers in Widikum Subdivision engage in “*njangi*” groups with the expectation of accessing funds at low interest rates to purchase inputs for their palm fields, thereby enhancing production and improving their livelihoods with the sales of palm oil. However, the actual situation on the ground presents a stark contrast to these expectations. They often lack the basic contributions needed to participate effectively in “*njangi*” groups and access the necessary capital for investment in their oil palm fields. A significant proportion of farmers struggle to meet their financial obligations within “*njangi*” groups, leading to exclusion from these networks and limited access to credit for input purchases. Other constraints include limited access to formal credit, fluctuations in market prices for palm oil, environmental challenges such as global climate change (Tume *et al.*, 2020) and land degradation. Concerted efforts from both government agencies and civil society organizations to provide support and capacity-building initiatives for “*njangi*” groups, ensuring their continued relevance and effectiveness in Cameroon's evolving socio-economic landscape are necessary to address these challenges. This study examines the determinants of participation in “*njangi*” groups and their effects on input investments among oil palm farmers in the Widikum Subdivision, located in the Momo Division of the Northwest region in Cameroon. This paper argues that addressing the challenges faced by oil palm farmers in accessing capital through “*njangi*” groups is essential for promoting sustainable palm oil production and improving livelihoods in Widikum. We discussed the research methodology and moved to a presentation of results and a discussion of empirical findings.

2. Research Methodology

2.1. Study Area

Widikum Subdivision is in the Momo Division, situated some 22km (Akon and Lon, 2021) away from the regional headquarters, Bamenda (Figure 1). Situated geographically, Widikum lies between latitude 5° N 43 – 5° N 54 and longitude 9° E 41 – 9° E 44 (Ferahtia, 2021). This geographical space constitutes one out of five Subdivisions in the Division including Mbengwi, Njikwa, Ngie and Batibo Subdivisions (Boh, and Richard, 2019), with Mbengwi representing the Divisional headquarters (INS, 2017). Widikum is characterized by temperature variations from 190 C to 250 C around Upper Menka and between 29⁰C and 32⁰C towards Widikum Town and the Ambelle region (WCDP, 2011). The region boasts a tropical climate with significant rainfall between mid-March and mid-November (Wanji *et al.*, 2005). The dry season extends from mid-

November to mid-March (Wanji *et al.*, 2005). The area has a varied relief, encompassing both lowland and highland areas.

Figure 1: Map of Widikum, Momo Division, Northwest Region, Cameroon



Source: Widikum-Boffe Council Development Plan (2011)

2.2. Research Design

The survey design was adopted to examine the determinants of participation in “*njangi*” groups and their effects on input investments among oil palm farmers in the Widikum Subdivision. The quantitative technique of data collection was adopted. A survey was carried out in the study area from April to July 2024; standardized questionnaires were used to collect numerical data from participation in “*njangi*” groups. The population of this study comprises oil palm farmers in

Widikum Subdivision, a prominent palm oil production area in the Northwest Region, Cameroon. The study targets oil palm farmers who were members of “*Django*” groups. From consultations with the Widikum Municipal Council (2011), it was estimated that Widikum had about 86,822 inhabitants with more than 70% of the population actively and partially involved in oil palm production (Wanji, 2005). Non-oil palm farmers were excluded from the sample.

A total of 225 participants were included in this research. The Widikum Subdivision was purposively chosen due to its significant potential for palm oil production in the area. A stratified random sampling technique was employed to choose the participants for the study. Initially, the population of Widikum was categorized into (15) strata, and all the oil palm “*njangi*” groups within each stratum were identified. A random sampling method was utilized to choose (1) “*njangi*” group from each stratum, resulting in a total of 369 members, with (15) members randomly chosen from each “*njangi*” group, culminating in a sample size of 225 participants to guarantee proportional representation of each subgroup.

A structured questionnaire was used to examine the determinants of oil palm farmers' participation in “*njangi*” groups and their investment behaviours in palm oil production. Key areas covered in the questionnaire include farmers' demographic information, factors influencing farmers' participation in “*njangi*” groups, how participation in “*njangi*” groups affects input investment for palm oil production, challenges faced by farmers participating in “*njangi*” groups and strategies that can be adopted to enhance farmers' participation in “*njangi*” groups.

To ensure the validity of the instruments, member checking was conducted, and peer debriefing was utilized. This involved discussions with fellow researchers in the field to critically examine the data analysis process and ensure methodological rigour. The dependability of instruments was confirmed by computing Cronbach's alpha for Likert-scale items to verify that they consistently measure the same underlying construct. All participants provided their informed consent before participating in the study for ethical considerations. Confidentiality was rigorously upheld during the entire research process. Data for this study was acquired from a variety of primary and secondary sources. Primary data was obtained from participants with a survey tool. Secondary data sources were acquired by reviewing published documents and guiding researchers in crafting survey questions.

To analyze the factors influencing farmers' participation in “*njangi*” groups, a robust Ordinary Least Squares (OLS) regression analysis and pairwise correlation metrics were employed. The dependent variable in this analysis was the participation status of farmers in “*njangi*” groups, which is typically a binary variable (1 for participation, Zero (0) for non-participation). The independent variables include financial support, social connections, money saving, information sharing and financial risk management. Socio-economic factors such as age, gender, education

level, longevity in farming, and farm size are control variables. The OLS regression model enables the assessment of the connection between these independent variables and the probability of joining "njangi" groups.

Model Specifications:

$$\text{Participation} = \beta_0 + \beta_1\text{FS} + \beta_2\text{SC} + \beta_3\text{MS} + \beta_4\text{InfoS} + \beta_5\text{FRM} + \beta_6\text{Age} + \beta_7\text{Gen} + \beta_8\text{Edu} + \beta_9\text{FarmSize} + \beta_{10}\text{LonFam} + \epsilon$$

Where: β_0 represents the intercept term

The coefficients of the independent variables needing identification are $\beta_1, \beta_2, \dots, \beta_{10}$.
 ϵ = Term for error

This model helps to determine the extent to which each factor influences the probability of farmers participating in "njangi" groups.

The second objective on how participation in "njangi" groups affects input investment in palm oil production was analyzed using a robust OLS regression model and pairwise correlation metrics. The dependent variable was the level of input investment, measured as the amount of money spent on inputs such as seeds, fertilizers, and pesticides. The key independent variables were credit availability, financial security, access to quality inputs, budget planning, and financial risk reduction while other control variables included farm size, gender, age, longevity in farming and educational level.

Model Specification: Y

$$Y = \beta_0 + \beta_1\text{CreAv} + \beta_2\text{FinS} + \beta_3\text{AQI} + \beta_4\text{BPlan} + \beta_5\text{FinRR} + \beta_6\text{FarmSize} + \beta_7\text{Age} + \beta_8\text{Gen} + \beta_9\text{Edu} + \beta_{10}\text{LonFam} + \epsilon$$

Where: Y = Amount of input investment by farmer

β_0 = Constant term

$\beta_1, \beta_2, \dots, \beta_{10}$ = Parameters of the independent variables

ϵ = Term for error

This analysis helped reveal how participation in "njangi" groups influences the level of financial resources allocated to palm oil production inputs.

The challenges faced by farmers participating in "njangi" groups, were examined through descriptive statistics. Frequency distributions, percentages, and averages were used to summarize

and present data on the various challenges identified by the farmers, such as financial constraints, lack of trust, group mismanagement, and difficulties in meeting contribution requirements. The analysis provided insights into the most common and significant challenges hindering effective participation in “*njangi*” groups.

For the fourth objective, descriptive statistics were used to analyze the strategies that could enhance farmers' participation in “*njangi*” groups. Data collected on suggested strategies, such as improving financial literacy, increasing transparency within groups, and providing external support or incentives, were summarized using frequencies and percentages. This analysis identifies the most feasible and impactful strategies according to the farmers’ perspectives, which could be adopted to improve participation rates in “*njangi*” groups.

3. Results and Discussion

Participant Demographic Features

The findings in Table 1 summarise key descriptive statistics for five variables: age of respondents, gender, educational level, farm size in hectares, and longevity in farming. The results suggest that participants have an average age of approximately 41 years. The standard deviation is 14.59, revealing a moderate level of age diversity among the sample. The skewness value of 0.39 shows a slight positive skewness in the age distribution, while the kurtosis of 2.88 suggests a distribution that is almost normal with a moderate peak. For gender, the table reveals that the mean value is 1.34, which typically represents a binary coding system (e.g., 1 for male and 2 for female), showing a predominance of one gender in the sample. The low variance (0.23) and standard deviation (0.47) indicate little variability, while a skewness of 0.68 shows a minor positive skew and a kurtosis of 1.46 implies a comparatively flat distribution. The findings show that the average educational level is 2.83, accompanied by a standard deviation of 1.38, suggesting a variety of educational backgrounds among participants. A skewness of 0.17 indicates an almost symmetrical distribution, whereas a kurtosis of 1.82 indicates a distribution having lighter tails than a normal distribution. The findings reveal that the average farm size is around 6.29 hectares, showing a significant standard deviation of 5.60. Such results indicate a notable diversity in farm sizes. The skewness of 4.23 indicates a strong positive skew, as many participants possess smaller farms, and the elevated kurtosis value of 28.42 implies a sharply peaked distribution featuring significant outliers. The findings on longevity in farming reveal an average of 19.90 years, with a standard deviation of 13.83, showcasing considerable diversity in farming expertise.

The skewness of 1.20 demonstrates a positive skew, implying that many respondents possess fewer years of farming experience, while the kurtosis of 4.14 indicates a distribution with tails

heavier than normal, suggesting the presence of some extreme values. Various aspects affecting involvement in “*njangi*” groups were emphasized, focusing on financial assistance, social ties, joint savings, access to information, and risk management in palm oil production.

Table 1 Demographic Characteristics of Participants

Statistics	Age of Respondent	Gender of Respondent	Educational Level	Farm size in Hectares	Longevity in Farming
Valid	225	225	225	225	225
N Missing	0	0	0	0	0
Mean	41.03571	1.339286	2.834821	6.291071	19.90179
Variance	212.8866	.2251762	1.905329	31.35005	191.228
SD	14.59063	.4745273	1.380337	5.599112	13.82852
Kurtosis	2.882984	1.460882	1.822812	28.42439	4.138545
Skewness	.3875999	.6788829	.1650042	4.231789	1.198825

3.2. Factors Influencing Farmers' Participation in Njangi Groups

The findings in Table 2 reveal that many participants (72.9%) agree or strongly agree that participation in “*njangi*” groups provides essential financial support for inputs investment in palm oil production, (with 7.6%) disagree. Financial support is a key motivator for joining these groups. Social connections are also a significant factor, (87.1%) of participants agree or strongly agree that being part of a “*njangi*” group strengthens community ties and encourages participation. This demonstrates the importance of social networks in influencing group membership. The ability to save money collectively is considered important (59.1%) of participants agree or strongly agree though (25%) either disagree or strongly disagree, suggesting that while this is a factor, it may not be the primary reason for all participants. *Njangi* groups are valued for providing valuable information about input and farming practices (70.2%) of participants agree or strongly agree. This highlights the role of these groups in disseminating important agricultural knowledge. Finally, (63.5%) of respondents believe that *Njangi* groups help in managing financial risks associated with input investments in palm oil production, although (8%) disagree or strongly disagree. This reflects a significant perception of the groups' role in financial risk management among their members.

Examining the factors that affect farmers' involvement in "*njangi*" groups in Widikum uncovers important insights into the motivations for joining these groups. The p-values for numerous

factors, as emphasized in the analysis, provide a detailed insight into the influences on participation. Crucial elements like financial assistance and social ties drive farmers to participate in “*njangi*” groups. In particular, the P-value for financial assistance is 0.012, showing that it has a significant impact on participation. This discovery underscores the importance of financial incentives in drawing members to financial support groups, as revealed in previous studies (Manjenje and Muhanga, 2021). Social connections significantly contribute as well, with a p-value of 0.132, indicating that although social ties matter, they are not as statistically meaningful as financial assistance. This aligns with the findings of Mansuri and Rao (2013). They emphasized the significance of social networks in group dynamics, all the while recognizing the overarching influence of financial aspects. Saving money is noted as a significant motivator, with a p-value of 0.000, further supporting earlier research emphasizing group savings as a major driver for participation (Fafchamps and Minten, 2012). However, the decreased significance of information exchange and financial risk management (with p-values of 0.209 and 0.003, respectively) suggests that while these factors are important, they are not as vital as financial backing and social connections. This underscores an area for additional investigation to understand why financial risk management is less effective in this scenario compared to another research.

Table 2. Factors Influencing Farmers' Participation in *Njangi* Groups

Items	SD (%)	D (%)	N (%)	A (%)	SA (%)
Participation in “ <i>njangi</i> ” groups provides you with the necessary financial support for your palm oil farming activities	0.9% (2)	6.7% (15)	19.6% (44)	48.0% (108)	24.9% (56)
Being a member of a “ <i>njangi</i> ” group strengthens your social connections within the community, which encourages your participation	0.0% (0)	2.2% (5)	10.7% (24)	48.4% (109)	38.7% (87)
The ability to save money collectively is a significant factor in your decision to join “ <i>njangi</i> ” groups	9.4% (21)	15.6% (35)	16.0% (36)	42.7% (96)	16.4% (37)
<i>Njangi</i> groups provide you with valuable information about available inputs and farming practices.	0.4% (1)	4.0% (9)	25.3% (57)	50.2% (113)	20.0% (45)
Participation in “ <i>njangi</i> ” groups helps you manage financial risks associated with input investments in palm oil production.	2.7% (6)	5.3% (12)	28.4% (64)	42.2% (95)	21.3% (48)

3.3. Participation in Njangi Groups Affects Input Investment for Palm Oil Production.

The findings presented in Table 3 highlight the main factors that influence individuals' involvement in "njangi" groups, especially within palm oil production. The results suggest that a considerable proportion of participants – 86.7% to be exact – either agree or strongly agree that accessing credit from "njangi" groups motivates them to enhance their investments in palm oil production. Only a small minority (2.2%) disagrees or strongly disagrees, suggesting that credit access is a powerful incentive for group participation. Security in financing agricultural inputs is another important factor, with (70.7%) of participants agreeing or strongly agreeing that they joined "njangi" groups because they provide a secure means to finance their agricultural activities. However, (7.1%) of participants disagree or strongly disagree, indicating that while this is a crucial factor for many, it is not universal.

Access to better quality agricultural inputs is highly valued (82.3%), and participants agree or strongly agree that "njangi" groups facilitate this access. This elevated level of agreement underscores the role of "njangi" groups in improving farming outcomes by enabling members to obtain superior input. Effective planning and budgeting for input investments are also significant benefits of "njangi" group participation, (with 74.2%) of participants agreeing or strongly agreeing that these groups help them plan and budget more effectively. The low level of disagreement (5.8%) further emphasizes the importance of this factor in encouraging participation. Finally, participation in "njangi" groups is seen to reduce financial risks associated with input investments, (with 68.9%) of respondents agreeing or strongly agreeing with this statement. However, (5.4%) disagree or strongly disagree, suggesting that while risk reduction is a key advantage for most, some respondents may perceive it differently.

Examining the extent to which participation in "njangi" groups affects input investment in palm oil production reveals some critical findings. The p-values indicate that "njangi" groups positively affect farmers' investment in fertilizers, pesticides, and advanced farming equipment, with p-values of 0.006 for access to quality inputs and 0.000 for planning and budgeting. The implications are that "njangi" group membership significantly enhances farmers' ability to invest in essential agricultural inputs. This aligns with earlier studies that highlight the importance of collective financial systems in enhancing agricultural productivity (Karlán *et al.*, 2017). The positive impact of "njangi" groups on obtaining modern farming tools and high-quality seedlings, with p-values of 0.000 and 0.000, showcase their effectiveness in facilitating substantial investments. These findings align with the conclusions drawn by Deininger and Liu (2013). They highlighted the potential of financial groups to increase agricultural investments through improved access to resources. The enhancements in investment consistency and total productivity, with p-values of 0.000, further confirm the substantial positive impacts of "njangi"

group involvement, consistent with research that endorses the advantages of joint financial assistance in improving agricultural results (Woolcock, 2001).

Table 3. How Participation in “Njangi” Groups Affects Input Investment

Items	SD (%)	D (%)	N (%)	A (%)	SA (%)
The availability of credit from “njangi” groups motivates you to invest more in palm oil production.	1.3% (3)	0.9% (2)	11.1% (25)	46.7% (105)	40.0% (90)
You joined “njangi” groups because they provide a secure way to finance your agricultural inputs.	1.3% (3)	5.8% (13)	22.2% (50)	46.7% (105)	24.0% (54)
Njangi Groups facilitate your access to better quality agricultural inputs.	1.8% (4)	2.2% (5)	13.8% (31)	60.5% (136)	21.8% (49)
Participation in “njangi” groups helps you to plan and budget for your input investments more effectively.	0.0% (0)	5.4% (12)	20.0% (45)	49.8% (112)	24.4% (55)
Being part of a “njangi” group reduces the financial risks associated with input investments.	1.8% (4)	3.6% (8)	25.8% (58)	38.7% (87)	30.2% (68)

3.3.1. Correlation Analysis

The Pair-Wise Correlation Matrix in Table 4 was utilized to assess the connections between different predictors and demographic variables in the research. The availability of credit demonstrates a positive yet weak association with secured financing (0.0936) and input accessibility (0.2145), although it is not significantly connected to other factors. Secure finance exhibits a moderate positive correlation with access to inputs (0.3521) and with planning and budgeting (0.4209), suggesting that secure finance is linked to enhanced access to inputs and improved planning. Access to inputs shows a positive correlation with planning and budgeting (0.2410) as well as risk reduction (0.4599), indicating that enhanced access to inputs relates to improved financial planning and risk management. Planning and budgeting demonstrate a significant positive correlation with risk mitigation (0.4151), suggesting that efficient planning and budgeting help lower financial risks. The age of participants has a weak correlation with several variables, indicating minor positive correlations with credit availability (0.0598) and access to resources (0.0318), while exhibiting a negative correlation with planning and budgeting (-0.2011).

Gender shows a negative relationship with credit access (-0.1810) and other financial factors, indicating that gender may affect financial choices in varied ways. Educational attainment shows a moderate negative relationship with credit access (-0.2502) and a positive relationship with planning and budgeting (0.2107), suggesting that education might influence both credit

availability and financial planning. Farm size exhibits a slight positive correlation with risk reduction (0.2111) and planning and budgeting (0.1202), but its effect on the other factors is negligible. The longevity in farming shows a moderate positive correlation with age (0.7915), yet its associations with other financial factors are weak. This implies that greater farming experience is closely tied to the age of the participants but has a lesser impact on other financial indicators. In general, the matrix shows that although there are notable correlations between financial elements and demographic factors, the associations are moderate. The examination underscores the relationship between financial behaviours and demographic traits, pointing out regions where monetary management and demographic elements converge.

Table 4. Pair-Wise Correlation Matrix

Items	Credit availability	Secure Finance	Access to inputs	Plant & Budgeting	Risk reduction	Age	Gender	Educa tion	Farm Size	Longev ity
Credit availability	1.0000									
Secure Finance	0.0936	1.0000								
Access to inputs	0.1625	0.3521	1.0000							
Plant& budgeting	0.0012	0.0000	0.2410	1.0000						
Risk reduction	0.0587	0.4209	0.0003	0.4151	1.0000					
Age	0.3822	0.0000	0.4599	0.0000	0.0000	1.0000				
Gender	0.0448	0.3702	0.0000	0.0000	-0.0934	0.1636	1.0000			
Education	0.5049	0.0000	0.0000	0.0000	0.2315	0.0154	-0.1617	1.0000		
Farm size	0.0598	0.0438	0.0318	-0.2011	0.0910	-0.1863	0.0996	0.0002	1.0000	
Longevity	0.3733	0.5142	0.6361	0.0025	0.2107	0.0910	0.0052	0.1371	0.0002	1.0000
	-0.1810	-0.0757	-0.0959	0.0204	0.1748	0.0052	0.1371	0.0002	0.0638	0.3422
	0.0066	0.2594	0.1524	0.7619	0.2315	0.0154	1.0000	0.0002	0.0169	0.8015
	-0.2502	0.0499	0.0596	0.2107	0.0910	-0.1863	0.0996	0.0002	0.0169	0.8015
	0.0002	0.4570	0.3750	0.0015	0.1748	0.0052	0.1371	0.0002	0.0169	0.8015
	0.0638	0.0169	0.0910	0.1202	0.2111	0.2001	-0.0019	-0.0117	1.0000	0.8620
	0.3422	0.8015	0.1745	0.0727	0.0015	0.0026	0.9775	0.8620	0.2227	1.0000
	0.0871	0.0887	0.1100	-0.1143	0.0151	0.7915	-0.2047	-0.2541	0.2227	1.0000
	0.1938	0.1862	0.1007	0.0878	0.8223	0.0000	0.0021	0.0001	0.0008	0.0008

3.3.2. Robust Ordinary Least Square Regression

Table 5 showcases the results of a Robust Ordinary Least Squares (OLS) regression analysis, which delves into the impact of various predictors on investment decisions. The results suggest that the credit accessibility coefficient is 0. 0183, with a dependable standard error of 0. 0137. This results in a t-value of 1. 33 and a p-value of 0. 185. This signifies that credit access does not significantly impact investment decisions, as the p-value exceeds the typical threshold of 0. 05. Financial security is associated with a coefficient of 0. 0271 and a robust standard error of 0. 0142. This leads to a t-value of 1. 91 and a p-value of 0. 057. Almost reaching significance, the finding slightly surpasses the 0. 05 threshold. This suggests that financial security may have a

positive impact on investment decisions, albeit not in a statistically significant manner. Access to quality inputs has a coefficient of 0.0507, accompanied by a dependable standard error of 0.0183. This results in a t-value of 2.77 and a p-value of 0.006.

This significant p-value demonstrates that improved access to high-quality input has a positive impact on investment decisions. In the realm of planning and budgeting, there is a coefficient of 0.0787 complemented by a robust standard error of 0.0182. These are further supported by a t-value of 4.32 and a p-value of 0.000. This significant statistical finding emphasizes the importance of careful planning and budgeting to enhance investment decisions. The decrease in financial risk is indicated by a coefficient of 0.0426, accompanied by a robust standard error of 0.0183. This results in a t-value of 2.32 and a p-value of 0.021. The significant p-value demonstrates that strategies aimed at reducing financial risks positively impact investment decisions. The age of the respondents shows a coefficient of -0.0005, with a robust standard error of 0.0012. This results in a t-value of -0.39 and a p-value of 0.695. This implies that age has a minimal impact on investment decisions. The participants' gender coefficient stands at 0.0360, accompanied by a robust standard error of 0.0223. This leads to a t-value of 1.62 and a p-value of 0.107. This p-value suggests that gender does not significantly influence investment decisions, despite exerting a minor influence. The education level indicates a coefficient of -0.0001, accompanied by a reliable standard error of 0.0083. This yields a t-value of -0.02 and a p-value of 0.988. This discovery implies that the extent of education has a minimal impact on investment decisions. The farm's size shows a coefficient of 0.0002, with a sturdy standard error of 0.0015. This results in a t-value of 0.11 and a p-value of 0.910. The p-value indicates that the size of a farm does not have a substantial impact on investment decisions. In agriculture, longevity is reflected by a coefficient of -0.0006, with a robust standard error of 0.0012. This results in a t-value of -0.47 and a p-value of 0.641. This suggests that the length of time spent on farming does not significantly impact investment decisions.

Table 5. Robust Ordinary Least Square

Inve	Coef.	Robust Std. Err.	t	P>t	[95% Conf.	Interval]
Credit availability	.0182623	.0137432	1.33	0.185	-.0088277	.0453523
Financial security	.0270822	.0141585	1.91	0.057	.054991	.0008266
Access quality inputs	.0507342	.0183069	2.77	0.006	.08682	.0146484
Planning budget	.0787114	.018222	4.32	0.000	.1146299	.0427929
financial risks reduction	.0426499	.0183442	2.32	0.021	.0788094	.0064904
Age of respondent	-.0004895	.0012483	-0.39	0.695	-.0029502	.0019712
gender of respondent	.0360473	.0222679	1.62	0.107	-.0078464	.0799411
Educational level	-.000126	.0083339	-0.02	0.988	-.0165534	.0163014
Farm size	.0001648	.0014534	0.11	0.910	-.0027002	.0030298
Longevity in farming	-.000569	.0012178	-0.47	0.641	-.0029694	.0018315
_cons	.9141718	.1126077	8.12	0.000	.6922034	1.13614
		F (10, 213)	=	11.66		
		Prob > F	=	0.0000		
		R-squared	=	0.4357		

3.3.3. VIF Test for Multicollinearity

The comprehensive model (Table 6) demonstrates statistical significance, with an F-value of 11.66 and a p-value of 0.0000. This indicates that the predictors collectively explain a substantial portion of the variability in investment decisions. The R-squared value of 0.4357 suggests that approximately 43.57% of the variance in investment decisions is explained by the predictors employed. The VIF findings indicate that multicollinearity is not a major concern, as the average VIF value stays below 2.5. In the realm of OLS regression, numerous authors advocate for utilizing the average VIF as a standard measure to evaluate the extent of multicollinearity. O'Brien (2007) suggested that a VIF average of 2.5 or more indicates the presence of significant multicollinearity, ranging from moderate to severe. The author highlights that this threshold aligns well with the heuristic suggested by Neter *et al.* (1996), and the R-squared value for a regression model starts to stabilize. Kutner *et al.* (2005) indicate that a mean VIF (Variance Inflation Factor) of five or higher indicates a significant presence of multicollinearity. The threshold mentioned is determined through simulation studies and real-world evidence. It aligns with the guidelines put forth by Neter *et al.* (1996). Gujarati (2003) suggests that a mean VIF of 10 or above can be used as a benchmark for identifying significant multicollinearity. The writer acknowledges that this limit is set based on the findings of simulation experiments and is in line with the suggestions put forth by Neter *et al.* (1996).

Table 6. Variance Inflation Factor (VIF) Test for Multicollinearity

Variable	VIF	1/VIF
Longevity	2.92	0.342400
Age	2.86	0.350251
Financial_~n	1.57	0.636364
Planning_b~t	1.48	0.676074
Access_qua~s	1.42	0.705230
Financial_~y	1.40	0.716142
Education	1.20	0.830025
Credit_ava~y	1.17	0.852774
Farm_size	1.14	0.875106
Gender	1.09	0.919230
Mean VIF	1.62	

3.3.4. Breusch-Pagan/Cook-Weisberg Test for Heteroskedasticity

Finally, this section delves into investigating the presence of heteroskedasticity within our model. Table 7 sheds light on this analysis. To accomplish this, we employ the Breusch-Pagan and Cook-Weisberg tests to detect heteroskedasticity. According to the conclusion, the null hypothesis of constant variance is not rejected. This indicates that our estimated model does

exhibit heteroskedasticity. Numerous researchers have delved into the exploration of incorporating heteroskedasticity in Ordinary Least Squares (OLS) regression. They have put forth guidelines for identifying and addressing heteroskedasticity. White (1980) presents a method for detecting heteroskedasticity and recommends using a 5% significance level to determine whether the null hypothesis should be rejected. Greene (2000) delved into the effects of heteroskedasticity and proposed a rejection threshold of 10%. Kennedy (2003) explored different methods to detect heteroskedasticity and recommended a significant level of 5% for rejecting the null hypothesis.

Table 7. Breusch-Pagan/Cook-Weisberg Test for Heteroskedasticity

Breusch-Pagan / Cook-Weisberg Test for Heteroskedasticity	
Ho: Constant variance	
Variables: fitted values of inve	
Chi ² (1)	= 40.36
Prob >Chi ²	= 0.0000

3.4. Challenges Faced by Farmers Participating in *Njangi* Groups

Table 8 demonstrates that a large majority of participants (90.2%) concur or strongly concur that elevated interest rates on loans from "*njangi*" groups hinder their involvement. This indicates that financial costs associated with loans are a major concern for most members, affecting their willingness to engage fully with the groups. The findings show that trust among "*njangi*" group members also poses a challenge; (with 89.3%) agreeing or strongly agreeing that lack of trust impacts their willingness to join or stay in the group. This reflects a strong perception that trust issues are a substantial barrier to effective group participation. The study results also indicate that meeting the regular financial contributions required by "*njangi*" groups is challenging for (70.2%) of participants who agree or strongly agree with this statement. This suggests that the financial demands of group membership can be a significant obstacle for many participants. From the findings, transparency in the management of "*njangi*" group funds is another critical issue, (with 88.9%) of participants agreeing or strongly agreeing that a lack of transparency discourages their participation. These highlight concerns about the management and accountability of group resources.

Finally, the time and effort required for active participation in "*njangi*" groups are viewed as too demanding (71.1%) of participants, who agree or strongly agree. This indicates that the commitment required by the groups can be a considerable challenge for many members, potentially affecting their overall engagement. The analysis of challenges farmers face in

participating in “*njangi*” groups reveals many critical barriers. High interest rates on loans were identified as a significant deterrent to participation, reflecting concerns about the cost of borrowing. The implications are that many oil palm farmers will not be encouraged to participate in “*njangi*” groups, affecting their input investment for palm oil production. This discovery aligns with earlier studies emphasizing high interest rates as a significant barrier in microfinance and group lending frameworks (Cai *et al.*, 2023). Lack of trust among group members and issues with financial contributions also emerge as significant challenges. These findings align with the research conducted by Ihli *et al.* (2024), an event that underscored the vital roles that trust, and financial dedication play in the prosperity of community financial organizations. The lack of transparency in fund management further exacerbates these challenges, highlighting the need for greater transparency in financial dealings within “*njangi*” groups. This aligns with the concerns raised by Rego *et al.* (2022) regarding the importance of transparency in maintaining member confidence and participation. The demanding nature of active participation also poses a challenge, reflecting the strain on farmers' time and resources, which is consistent with findings by Magambo (2024) about the resource constraints faced by participants in microfinance groups.

Table 8. Challenges Face by Oil Palm Farmers’ Participation in *Njangi* Groups

Variables	SD (%)	D (%)	N (%)	A (%)	SA (%)
High interest rates on loans from “ <i>njangi</i> ” groups are a barrier to your participation.	0.9% (2)	1.8% (4)	7.1% (16)	35.1% (79)	55.1% (124)
Lack of trust among “ <i>njangi</i> ” group members affects your willingness to join or remain in the group.	0.4% (1)	3.1% (7)	7.1% (16)	46.2% (104)	43.1% (97)
You find it challenging to meet the regular financial contributions required by “ <i>njangi</i> ” groups.	0.4% (1)	11.1% (25)	18.2% (41)	41.3% (93)	28.9% (65)
There is a lack of transparency in how “ <i>Njangi</i> ” group funds are managed, which discourages your participation.	0.0% (0)	3.1% (8)	7.6% (17)	39.6% (89)	49.3% (111)
The time and effort required to actively participate in “ <i>njangi</i> ” groups are too demanding for you.	4.0% (9)	12.9% (29)	12.0% (27)	36.4% (82)	34.7% (78)

3.5. Strategies that can be adapted to Enhance Farmers' Participation in *Njangi* Groups

Table 9 reveals that most participants (68.8%) agree or strongly agree that providing more education and training about “*njangi*” groups would boost participation. This indicates that increased knowledge and understanding of the groups are seen as essential for encouraging greater involvement. The findings also show that reducing membership fees is also viewed as a potential strategy to increase participation (with 69.6%) of participants agreeing or strongly agreeing that lower fees would encourage more people to join. This suggests that financial barriers are a significant consideration for potential members. Enhancing transparency and trust within “*njangi*” groups is perceived as a crucial factor for improving participation, (with 89.8%)

of participants agreeing or strongly agreeing that such improvements would promote more active involvement.

This underscores the importance of accountability and trust in fostering engagement. Simplifying the process to access funds from “*njangi*” groups is seen as highly beneficial, (with 91.9%) of respondents agreeing or strongly agreeing that this would encourage more frequent participation. This highlights the need for more straightforward procedures to facilitate easier access to group resources. Strengthening community support and peer networks is also recognized to improve participation, (with 80.8%) of participants agreeing or strongly agreeing with this strategy. This reflects the value of strong community ties and supportive networks in enhancing group involvement. The strategies to enhance participation in “*njangi*” groups are crucial for improving fund security and investment in palm oil production. The implications are that strategies such as providing more education and training and reducing membership fees can significantly increase participation.

This aligns with earlier studies that highlight the significance of education and lowered financial obstacles in enhancing engagement in financial groups (Mwaikokesya, 2018). Enhancing transparency and trust within groups was also highlighted as a critical strategy, aligning with literature that emphasizes the need for transparent operations to build trust and encourage active involvement (Grimmelikhuijsen *et al.*, 2024). Simplifying the process to access funds was also another effective strategy, reflecting the findings of Karlan and Zinman (2011), who found that streamlined processes improve participation rates in financial programs. Strengthening community support and peer networks further supports the importance of social support structures in enhancing group involvement, consistent with research by Banerjee *et al.* (2015) that highlights the role of community networks in fostering participation. These strategies align well with existing literature on improving group participation and highlight actionable measures for enhancing the effectiveness of “*njangi*” groups in Widikum.

Table 9. Strategies to Enhance Participation in *Njangi* Groups

Items	SD (%)	D (%)	N (%)	A (%)	SA (%)
Providing more education and training about “ <i>njangi</i> ” groups will increase participation	0.4% (1)	6.2% (14)	24.6% (55)	36.% (82)	32.6% (73)
Reducing membership fees would encourage greater participation in <i>njangi</i> groups.	0.9% (2)	6.7% (15)	22.8% (51)	42.% (96)	27.2% (61)
Enhancing transparency and trust within “ <i>janggi</i> ” groups will promote more active involvement.	1.3% (3)	4.9% (11)	4.0% (9)	41.% (93)	48.7% (109)
Simplifying the process to access funds from “ <i>njangi</i> ” groups would encourage more frequent participation.	1.3% (3)	1.3% (3)	5.4% (12)	33.% (77)	58.0% (130)
Strengthening community support and peer networks can improve participation in “ <i>njangi</i> ” groups.	0.9% (2)	3.1% (7)	15.2% (34)	45.% (102)	35.3% (80)

3.6. Determinants of Participation in Njangi Groups by Oil Palm Farmers

The findings in Table 10 reveal that most participants (69.8%) agree or strongly agree that their participation in “*njangi*” groups has increased their investment in fertilizers and pesticides for palm oil production. However, a notable (14.2%) disagree or strongly disagree, indicating that while the impact is positive for most, it is not universal. In terms of acquiring more advanced farming equipment, the results show that (83.6%) of participants agree or strongly agree that their involvement in “*njangi*” groups has enabled them to make such purchases. The low disagreement rate (2.6%) suggests that access to better equipment is a significant benefit of group participation. Investing in higher quality palm oil seedlings is another positive outcome of “*njangi*” group membership, (with 83.1%) of participants agree or strongly agree with this statement. The minimal disagreement (5.3%) underscores the importance of “*njangi*” groups in improving the quality of inputs available to farmers. Regularity and timeliness of input investments have also improved due to “*njangi*” groups’ participation, as reported (by 64.4%) of participants who agree or strongly agree. However, a high percentage of respondents (27.1%) remain neutral, indicating that the impact on investment timing might vary depending on individual circumstances. Finally, the overall productivity of oil palm farmers has seen a significant boost, (with 89.3%) of participants agree or strongly agree that “*njangi*” group participation has improved their farm’s productivity. The extremely low level of disagreement (3.6%) highlights the effectiveness of “*njangi*” groups in enhancing agricultural outcomes for their members.

Table 10. Impact of Njangi Group Participation on Input Investment

Variables	SD (%)	D (%)	N (%)	A (%)	SA (%)
Your participation in the “ <i>njangi</i> ” groups has increased your investment in fertilizers and pesticides for palm oil production.	0.9% (2)	13.3% (30)	16.9% (38)	39.1% (88)	30.7% (67)
You have been able to purchase more advanced farming equipment due to your involvement in “ <i>njangi</i> ” groups.	0.4% (1)	2.2% (5)	13.7% (31)	56.0% (126)	27.6% (62)
<i>Njangi</i> group membership has enabled you to invest in higher-quality palm oil seedlings.	0.4% (1)	4.9% (11)	11.6% (26)	52.9% (119)	30.2% (68)
Your input investments have become more regular and timelier since you joined the “ <i>njangi</i> ” group.	0.4% (1)	8.0% (18)	27.1% (61)	36.4% (82)	28.0% (63)
Participation in “ <i>njangi</i> ” groups has improved the overall productivity of your palm oil farm.	2.7% (6)	0.9% (2)	7.1% (16)	45.1% (101)	44.2% (99)

3.6.1. Correlation Analysis Test

A correlation analysis was conducted on the factors influencing participation in “*njangi*” groups and its impact on input investments for palm oil farmers in Widikum. The findings in Table 11 reveal a moderate positive correlation between financial assistance and saving money (0.4060, p

= 0.0000). This indicates that an increase in financial support boosts the likelihood of farmers saving money. This connection is statistically important, indicating that these two factors are strongly associated with input investments. Financial assistance also exhibits a positive relationship with information exchange (0.2567, $p = 0.0001$) and financial risk mitigation (0.3257, $p = 0.0000$), suggesting that enhanced financial support correlates with improved information sharing and risk management strategies. Social ties exhibit a weak yet positive relationship with information sharing (0.3642, $p = 0.0000$), indicating that oil palm farmers who possess stronger social ties are more inclined to participate in information-sharing activities. The strong link between social connections and financial assistance (0.2152, $p = 0.0012$) emphasizes that social networks could enhance financial support for oil palm farmers. Nonetheless, the relationship between social connections and financial risk management is weak and statistically insignificant (0.0133, $p = 0.8426$), suggesting that social connections might not directly affect risk management strategies. Saving money shows a weak yet notable positive correlation with information sharing (0.1682, $p = 0.0117$) and financial risk management (0.3528, $p = 0.0000$), indicating that farmers who focus on saving money are also inclined to participate in information sharing and manage risks effectively. Nonetheless, the relationship between money-saving and education level is positive yet weak (0.2515, $p = 0.0001$), suggesting that increased education may correlate with improved money-saving habits. The sharing of information indicates a positive relationship with financial risk management (0.1382, $p = 0.0388$). This implies that farmers who engage in exchanging information are likely to manage financial risks more proficiently. This connection, while statistically important, is quite weak.

Gender exhibits weak and non-significant correlations with other variables, except for social connections (-0.1424, $p = 0.0332$), where a slight negative correlation indicates that there may be minor differences between males and females regarding the influence of social connections on their farming practices. The educational level displays a slight positive correlation with farm size (0.1461, $p = 0.0288$), indicating that farmers with higher education could potentially operate slightly larger farms. Nonetheless, the relationship between education levels and longevity in farming is weak and negative (-0.2541, $p = 0.0001$), indicating that greater experience in farming may correspond to reduced levels of formal education. Farm size displays weak positive correlations with financial risk management (0.1793, $p = 0.0071$) and duration in farming (0.2227, $p = 0.0008$), suggesting that larger farms could be linked to improved risk management and greater farming experience. Nevertheless, the correlations aren't very strong, suggesting that additional factors might also have an important influence. The duration of experience in farming shows a slight negative correlation with financial assistance (-0.1502, $p = 0.0245$) and social ties (0.1024, $p = 0.1264$), suggesting that seasoned farmers might get diminished financial aid and possess less robust social ties. Moreover, the inverse relationship with education level indicates that individuals with more agricultural experience might possess less formal schooling.

Table 11. Pair-Wise Correlation Matrix

Variables	Finan~rt	Social~s	Money ~g	Inform~g	Finan~nt	Gender	Educa~tion	Farm~size	Longevi~ty
Financial~rt	1.0000								
Social_con~s	0.2152	1.0000							
Money saving	0.0012	0.0178	1.0000						
Information~g	0.4060	0.7915	0.1682	1.0000					
Financial~nt	0.2567	0.3642	0.0117	0.1382	1.0000				
Gender	0.0001	0.0000	0.0388	0.0388	0.0002	1.0000			
Education	0.3257	-0.0133	-0.0541	-0.1244	0.9979	0.0996	1.0000		
Farm_size	0.0000	0.8426	0.4207	0.0630	0.0291	0.1371	0.8620	1.0000	
Longevity	0.0372	-0.1424	0.2515	-0.1211	0.1459	0.0975	0.2227	0.0008	1.0000
	0.5794	0.0332	0.0001	0.0705	0.0071	0.9775	0.0001	0.0008	
	0.0657	-0.0858	0.2515	-0.1211	0.1459	0.0996	1.0000		
	0.3278	0.2009	0.0001	0.0705	0.0291	0.1371	0.8620	1.0000	
	0.1461	0.0528	0.1458	0.0992	0.1793	-0.0019	-0.0117	0.0008	1.0000
	0.0288	0.4314	0.0292	0.1390	0.0071	0.9775	0.8620	0.2227	0.0008
	-0.1502	0.1024	-0.1018	0.0892	0.0497	-0.2047	-0.2541	0.2227	1.0000
	0.0245	0.1264	0.1289	0.1833	0.4593	0.0021	0.0001	0.0008	0.0008

3.6.2. Robust Ordinary Least Square Regression

The outcomes from the Robust Ordinary Least Squares (OLS) regression analysis presented in Table 12 disclose a noteworthy positive correlation between financial aid and the dependent variable. The coefficient is 0.0365, and the p-value is 0.012, indicating statistical significance at the 5% threshold. The predictor reveals a positive impact of financial support on the dependent variable, supported by a 95% confidence interval, extending from 0.0082 to 0.0649. Social connections exhibit a humble coefficient of 0.0264, yet with a p-value of 0.132, it does not achieve statistical significance at the 5% level. The confidence interval for social connections ranges from -0.0080 to 0.0607. Conversely, saving money showcases a significant detrimental influence on the dependent variable. The coefficient is -0.0549, with a p-value of 0.000, showing substantial significance at the 1% threshold.

The confidence interval for saving money ranges from -0.0780 to -0.0318, suggesting a significant negative impact on the dependent variable. The coefficient for information sharing is -0.0188, with a p-value of 0.209. This suggests that it is not statistically significant. The 95% confidence interval spans from -0.0483 to 0.0106, indicating a negative coefficient, yet the impact is not significant enough to confidently establish its influence. Financial risk management demonstrates a significant positive correlation with the dependent variable, with a coefficient of 0.0457 and a p-value of 0.003. This discovery stands out significantly at the 1% threshold, as the confidence interval ranges from 0.0162 to 0.0752. It indicates that effective financial risk management has a beneficial impact on the dependent variable. The age of the respondents does not have a noticeable impact, as shown by a coefficient of 0.0005 and a p-value of 0.661. The confidence interval spans from -0.0017 to 0.0026, suggesting that the age probably does not

have a significant impact on the dependent variable. The coefficient for the respondent's gender is 0.0291 and a p-value of 0. This suggests that gender does not play a significant role in predicting the dependent variable. The confidence interval for gender ranges from -0.0178 to 0.0759, suggesting an insignificant impact. The educational level indicates a coefficient of -0.0033 and a p-value of 0.696, leading to the conclusion that it does not exert a substantial influence on the dependent variable. The 95% confidence interval extends from -0.0201 to 0.0134, indicating the lack of a significant impact.

The coefficient for farm size is 0.0014 with a p-value of 0.399. This implies that the size of the farm does not have a significant impact on the dependent variable. The confidence interval ranges from -0.0019 to 0.0046, indicating a subtle effect. In agriculture, the longevity demonstrates a negative coefficient of -0.0019 with a corresponding p-value of 0.085. At the 10% significance level, there is a notable finding with a confidence interval of -0.0042 to 0.0003. This suggests a slightly significant negative impact on the dependent variable. The constant term (_cons) carries a coefficient of 0.8895, which is highly significant with a p-value of 0.000. The 95% confidence interval ranges from 0.6561 to 1.1230, indicating a robust baseline impact of the dependent variable while keeping all predictors constant. The F-statistic for the model is 10.80, with a p-value of 0.0000, indicating a high level of statistical significance. The R-squared value stands at 0.4087, signifying that approximately 40.87% of the variance in the dependent variable is explained by the predictors in the model.

Table 12. Robust Ordinary Least Square

Variable		Robust Std. Err.	t	P>t	[95% Conf.	Interval]
Financial support	.0365305	.014367	2.54	0.012	.0648501	.0082109
Social Connections	.026357	.0174392	1.51	0.132	.0607325	.0080184
Money saving	-.0548793	.0117109	-4.69	0.000	-.0779633	-.0317953
Information Sharing	-.0188494	.0149602	-1.26	0.209	-.0483384	.0106395
Financial risks management	.0457018	.0149836	3.05	0.003	.0752369	.0161667
Age of respondent	.0004815	.0010966	0.44	0.661	-.0016802	.0026431
Gender of respondent	.0290573	.0237643	1.22	0.223	-.017786	.0759006
Educational level	-.0033234	.008488	-0.39	0.696	-.0200546	.0134079
Farm size	.0013903	.0016444	0.85	0.399	-.001851	.0046317
Longevity in farming	-.001947	.0011257	-1.73	0.085	-.0041659	.0002719
_cons	.8895181	.1184415	7.51	0.000	.6560504	1.122986
		F (10, 213) =	10.80			
		Prob > F =	0.0000			
		R-squared =	0.4087			

3.6.3. VIF Test for Multicollinearity

The Variance Inflation Factor (VIF) test was employed to evaluate multicollinearity among the variables in the regression model. The results indicated by VIF Table 13 show that multicollinearity is not a major concern as the average VIF stays below 2.5. In the realm of OLS

regression, multiple authors advocate for the usage of average VIF as a standard to assess the extent of multicollinearity. O'Brien (2007) argues that a mean VIF of 2.5 or more indicates the presence of moderate to severe multicollinearity. He points out that this threshold aligns with the guideline suggested by Neter *et al.* (1996) and marks the point at which the R-squared value for a regression model begins to stabilize. Kutner *et al.* (2005), that means VIF of 5 or more signifies substantial multicollinearity. They note that this threshold is based on both simulation studies and empirical data, and it is consistent with the guideline proposed by Neter *et al.* (1996). Gujarati (2003) posits that a mean VIF of 10 or higher is commonly used to identify significant multicollinearity. He noted that this limit is based on simulation study findings and corresponds to the guideline proposed by Neter *et al.* (1996).

Table 13. Variance Inflation Factor (VIF) Test for Multicollinearity

Variable	VIF	1/VIF
Longevity	2.91	0.344008
Age	2.79	0.358304
Financial~rt	1.43	0.698705
Money_saving	1.40	0.715109
Financial~nt	1.26	0.794552
Informatio~g	1.26	0.794663
Social_con~s	1.24	0.804323
Education	1.18	0.846501
Farm_size	1.12	0.889905
Gender	1.08	0.922239
Mean VIF	1.57	

3.6.4. Breusch-Pagan/Cook-Weisberg Test for Heteroskedasticity

In the end, this section delves into examining if our model is affected by the issue of heteroskedasticity. To achieve this, we applied the Breusch Pagan and Cook Weisberg test for heteroskedasticity. According to the results presented in Table 14, the null hypothesis affirming constant variance continues to be upheld, suggesting that the estimated model remains unaffected by the issue of heteroskedasticity. Many researchers have delved into exploring the utilization of heteroskedasticity in Ordinary Least Squares (OLS) regression and have put forward thresholds for determining the absence of heteroskedasticity. White (1980) introduces a heteroskedasticity test and suggests using a rejection threshold of 5%. Greene (2000) investigated the consequences of heteroskedasticity and suggested a rejection threshold of 10%. Kennedy (2003) investigated various tests for heteroskedasticity and suggested a rejection threshold of 5%.

Table 14. Breusch-Pagan/Cook-Weisberg Test for Heteroskedasticity

Breusch-Pagan / Cook-Weisberg test for Heteroskedasticity	
Ho: Constant variance	
Variables: fitted values of inve	
Chi ² (1) =	39.05
Prob >Chi ² =	0.0000

4. Conclusion

The study concludes that financial support, social connections, money-saving habits, information sharing, and financial risk management significantly influence farmers' participation in “*njangi*” groups and their input investments in oil palm farming in Widikum. Financial support, although essential, tends to reduce personal investments in inputs, indicating a substitution effect where external aid diminishes the need for personal financial contributions. In numerous agricultural contexts, social connections are crucial. However, they did not have a considerable influence on input investments. This implies that other factors may play a more pivotal role in this setting. Kennedy (2003) conducted a study on various tests for heteroskedasticity and suggested a rejection threshold of 5%. The availability of credit, financial stability, and access to high-quality inputs were identified as factors influencing involvement in “*njangi*” groups. Financial stability and the quality of input led farmers to choose more cautious investment approaches, potentially to reduce risks and guarantee long-term viability. The challenges of high membership fees, complex rules, trust issues, and competition for funds within “*njangi*” groups hinder effective participation, highlighting the need for structural adjustments to make these groups more accessible and dependable. The suggested strategies, including streamlining membership criteria, enhancing transparency, and offering education and training, underline the significance of fostering a more inclusive and supportive setting to boost farmers' involvement in “*njangi*” groups and maximize their investment returns in palm oil production.

The government should be able to put up policies that support the formalization and recognition of “*njangi*” groups as legitimate financial institutions to enhance their credibility and access to external funding sources, further boosting their role in supporting oil palm farmers in Widikum. To enhance farmers' participation in “*njangi*” groups and improve their access to funds for input investments, non-governmental organizations need to implement strategies that build capacity and foster an inclusive environment. Providing ongoing education and training on fiscal management, agricultural best practices, and the benefits of collective action can empower farmers to make more informed decisions and optimize their investments. Encouraging community support for “*njangi*” groups, through partnerships with local organizations or

agricultural cooperatives, can also help strengthen these groups' capacity to secure funds and support their members effectively. Addressing the challenges faced by farmers in participating in “njangi” groups requires targeted interventions. We recommend that reducing membership costs and streamlining group regulations might enhance accessibility for a wider variety of farmers, especially those with constrained financial means. To address trust concerns and enhance the dependability of team members, we suggest implementing transparent mechanisms for overseeing and assessing group activities, utilizing digital tools that monitor contributions and expenditures. Furthermore, adjustable meeting times or other communication options, like online meetings, may aid in addressing farmers' time limitations, facilitating their active involvement in “njangi” group events.

Acknowledgement

The publication of this research paper was made possible thanks to the generous support of the University of Fort Hare, Alice Campus, South Africa. One of the authors is employed there as a Postdoctoral Research Fellow.

References

- [1] Akon, E. T., & Lon, N. J. (2021). Challenges of peace building among the Widikum of the Bamenda Grassland of Cameroon, 1870-2014. *International Journal of Arts Humanities and Social Sciences Studies*, 6 (12). www.ijahss.com
- [2] Banerjee, A., Duflo, E., Glennerster, R., & Kinnan, C. (2015). The miracle of microfinance? Evidence from a random evaluation. *American economic journal: Applied economics*, 7(1), 22-53. DOI: 10.1257/app.20130533
- [3] Boh, N. M., & Richard, E. A. (2019). Factors associated with the implementation of the WHO breastfeeding recommendations in Momo division, North-West Region of Cameroon. *European Journal of Nutrition & Food Safety*, 11(3), 114-123. <https://doi.org/10.9734/ejnfs/2019/v11i330149>
- [4] Cai, J., Meki, M., Quinn, S., Field, E., Kinnan, C., Morduch, J., & Said, F. (2023). Microfinance. *VoxDevLit*, 3(2), 26. https://mmeki.com/wp-content/uploads/Microfinance_Issue_2.pdf, accessed October 2024.
- [5] Dabić, M., Dana, L. P., Nziku, D. M., & Ramadani, V. (2022). *Women entrepreneurs in Sub-Saharan Africa*. Cham: Springer Nature.

- [6] Deininger, K., & Liu, Y. (2013). Economic and social impacts of an innovative self-help group model in India. *World Development*, 43, 149-163. <https://doi.org/10.1016/j.worlddev.2012.09.019>
- [7] Dube, N. (2018). *Informal Social Security and Its Contributions Towards Meeting the Needs of the Poor: The Case of Stokvels in Soweto, South Africa* (Doctoral dissertation, University of the Witwatersrand, Faculty of Humanities, School of Social Work).
- [8] Fafchamps, M. (2011). Development, social norms, and task assignment. *Proceedings of the National Academy of Sciences*, 108(Supplement 4), 21307-21312. <https://doi.org/10.1073/pnas.1019457108>
- [9] Ferahtia, A. (2021). See discussions, stats, and author profiles for this publication. *Net/publication/350567414 surface water quality assessment in the semi-arid region (el hodna watershed, Algeria) based on water quality index (WQI)*.
- [10] Fonchingong, C. C. (2013). *Growing old in Cameroon: gender, vulnerability, and social capital*. University Press of America.
- [11] Greene, W. (2000). LIMDEP computer program: Version 8.0. *Econometric Software*, Plainview, New York.
- [12] Grimmelikhuijsen, S., de Vries, F., & Bouwman, R. (2024). Regulators as guardians of trust? The contingent and modest positive effect of targeted transparency on citizen trust in regulated sectors. *Journal of Public Administration Research and Theory*, 34(1), 136-149. <https://doi.org/10.1093/jopart/muad010>
- [13] Gujarati, D. (2003). *Basic econometrics. 4th ed.* New York: McGraw Hill, pp. 638-640.
- [14] Ihli, H. J., Mausch, K., & Fuchs, L. (2024). Behavioural determinants of trust and commitment in horticultural cooperatives: Experimental evidence from Rwanda. *World Development Sustainability*, 5, 100176. <https://doi.org/10.1016/j.wds.2024.100176>
- [15] INS (2017). *Northwest regional agency of the National Institute of Statistics in Bamenda*.
- [16] Jumfongai, V. D., & Thomas, N. D. (2022). The Role of Informal Financing on the Sustainability of Entrepreneurship in Kumba Municipality. *International Journal of Economics & Business Administration (IJEBA)*, 10(2), 130-163.
- [17] Karlan, D. & Zinman, J. (2011). Microcredit in theory and practice: Using randomized credit scoring for impact evaluation. *Science*, 332(6035), 1278-1284. DOI: [10.1126/science.1200138](https://doi.org/10.1126/science.1200138)

- [18] Karlan, D., Savonitto, B., Thuysbaert, B., & Udry, C. (2017). Impact of savings groups on the lives of the poor. *Proceedings of the National Academy of Sciences*, 114(12), 3079-3084. <https://doi.org/10.1073/pnas.1611520114>
- [19] Kennedy, P. (2003). *A guide to econometrics, 5th ed*, Blackwell Publishing, Oxford.
- [20] Kutner, Michael H., et al. (2005). *Applied linear statistical models*. McGraw-Hill.
- [21] Lehmann, J. M., & Smets, P. (2020). An innovative resilience approach: Financial self-help groups in contemporary financial landscapes in the Netherlands. *Environment and Planning A: Economy and Space*, 52(5), 898-915. <https://doi.org/10.1177/0308518X19882946>
- [22] Magambo, E. F. (2024). *An assessment of group lending challenges facing microfinance institutions in Mwanza, Tanzania*.
- [23] Manjenje, M., & Muhanga, M. (2021). Financial and non-financial incentives best practices in work organizations: a critical review of the literature.
- [24] Mansuri, G., & Rao, V. (2013). Can participation be induced? Some evidence from developing countries. *Critical Review of International Social and Political Philosophy*, 16(2), 04-08. <https://doi.org/10.1080/13698230.2012.757918>
- [25] Momasoh, C. M. (2023). International migration and social inclusion of migrants in South Africa: the case of Cameroonian Migrants in the Western Cape.
- [26] Mwaikokesya, M. (2018). Financial barriers affecting students from poor families' accessibility to higher education in Tanzania. In *Contexts for Diversity and Gender Identities in Higher Education: International Perspectives on Equity and Inclusion* (pp. 127-140). Emerald Publishing Limited.
- [27] Nchanji, E., Acheampong, P., Nghoh, S. B., Nyamolo, V., & Cosmas, L. (2024). Comparative analysis of youth transition in bean production systems in Ghana and Cameroon. *Humanities and Social Sciences Communications*, 11(1), 1-13. <https://doi.org/10.1057/s41599-024-02620-6>
- [28] Ndanitsa, M. A., Adetunji, A. O., Mohammed, D., & Ndako, N. (2021). Effects of agricultural credit delivery on the income of arable crop farmers in Niger state of Nigeria. *Journal of Agripreneurship and Sustainable Development*, 4(1), 10-32.
- [29] Ndlovu-Gatsheni, S. J. (2019). Rethinking development in the age of global coloniality. *Rethinking and unthinking development: Perspectives on inequality and poverty in South Africa and Zimbabwe*, 27-49.

- [20] Ndumbe, L., Ingram, V., & Awono, A. (2009). *Baseline Study on Gnetum spp. in the Southwest and Littoral Regions of Cameroon*. FAO-CIFOR-SNV-World Agroforestry Center-COMIFAC, Yaoundé, Cameroon.
- [31] Neter, J., Kutner, M. H., Nachtsheim, C. J., & Wasserman, W. (1996). *Applied linear statistical models*.
- [32] Ngoasong, M. Z. (2023). *Women's entrepreneurial journeys in sub-Saharan Africa*. Edward Elgar Publishing.
- [33] Ngwane, G. (2012). *The Cameroon Condition*. African Books Collective.
- [34] Nkwocha, O. U. (2019). *Microfinance, women's entrepreneurial development and empowerment in Nigeria* (Doctoral dissertation, Birmingham City University).
- [35] Nsamenang, A. B. (2014). *Human development in cultural contexts: Implications of the new life sciences*. Springer Science & Business Media.
- [36] O'brien, R. M. (2007). A caution regarding rules of thumb for variance inflation factors. *Quality & quantity*, 41, 673-690. DOI 10.1007/s11135-006-9018-6
- [37] Ojong, N. (2019). Healthcare financing in rural Cameroon. *Societies*, 9(4), 77. <https://doi.org/10.3390/soc9040077>
- [38] Rego, A., Cunha, M. P. E., & Giustiniano, L. (2022). Are relationally transparent leaders more receptive to the relational transparency of others? An authentic dialogue perspective. *Journal of Business Ethics*, 180(2), 695-709. <https://doi.org/10.1007/s10551-021-04792-6>
- [39] Stavropoulou, M., Holmes, R., & Jones, N. (2017). Harnessing informal institutions to strengthen social protection for the rural poor. *Global food security*, 12, 73-79. <https://doi.org/10.1016/j.gfs.2016.08.005>
- [40] Tamasang, C. F., Effala, C., & Tassah, I. T. (2021). Country report for Cameroon. In *African Soil Protection Law* (pp. 53-176). Nomos Verlagsgesellschaft mbH & Co. KG.
- [41] Tambi, M. D. (2023). Determinants of coffee production in Melong Coffee Zone, Cameroon. *Journal of Economic & Social Development (1849-6628)*, 10 (1).
- [42] Tawe, T. I. (2018). Highlands vulnerability to cattle rearing in Momo Division, Northwest Cameroon. *Planning*, 3(1), 10-15. doi: 10.11648/j.larp.20180301.12
- [43] Tume, S. J. P., Zetem, C. C., Nulah, S. M., Ndzifofo, A. E., Mbuh, B. K., Nyuyfoni, S. R., & Kwei, J. (2020). Climate change and food security in the Bamenda Highlands of Cameroon. *Food Security and Land Use Change under Conditions of Climatic Variability:*

A Multidimensional Perspective, 107-124. https://link.springer.com/chapter/10.1007/978-3-030-36762-6_6

- [44] Wabit Epse Ngawana, M. M. (2018). *Community-based organisations as an approach to effective sustainable artisan fishing*.
- [45] Wanji, S., Tendongfor, N., Esum, M., Yundze, S., Taylor, M. J., & Enyong, P. (2005). Combined utilisation of rapid assessment procedures for loiasis (RAPLOA) and onchocerciasis (REA) in rainforest villages of Cameroon. *Filaria journal*, 4, 1-10. <https://doi.org/10.1186/1475-2883-4-2>
- [46] WCDP (2011). *Widikum-Boffe Council Development Plan*.
- [47] White, H. (1980). A heteroskedasticity-consistent covariance matrix estimator and a direct test for heteroskedasticity. *Econometrica: journal of the Econometric Society*, 817-838. <https://doi.org/10.2307/1912934>
- [48] Wiykiynyuy, T. M., & Fozoudine, T. N. Y. (2021). Financial inclusion gaps between formal and informal beneficiaries in Cameroon: Does ethnicity-based social capital matter? *Revue Africaine des Sciences Economiques et de Gestion–Série Sciences Economiques*, 22, 93-149.
- [49] Woolcock, M. (2001). Microenterprise and social capital: A framework for theory, research, and policy. *The Journal of Socioeconomics*, 30(2), 193-198. [https://doi.org/10.1016/S1053-5357\(00\)00106-2](https://doi.org/10.1016/S1053-5357(00)00106-2)