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*RESEARCH ARTICLE*

# Determinants of Savings Participation in Community Based Savings Groups (CBSGs) Among Smallholder Rice Farmers in Jigawa State, Nigeria

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**ABSTRACT**

Savings are the germs of resilience for small-scale farmers protect farmers against uncertainties, empowering them to invest, innovate, and thrive even in the face of climate and market shocks. The study conducted to evaluate the determinants of Savings Participation in Community-Based Savings Groups (CBSGs) Among Smallholder Rice Farmers in Jigawa State, Nigeria. Data were collected from 100 pilot respondents across the state. The data were analyzed using descriptive statistics and multiple regression analysis. Based on the findings it can be concluded that the farming community faces systemic challenges related to gender disparity, low education, limited access to finance, and small farm sizes. This success highlights that targeted interventions can effectively address the systemic challenges faced by these farmers. The determinants of savings are found to be income generated (B =5.95, P<10), profits on investment (B =0.003, P<1) yield in kg, (B =10.94, P<1) acceptability of the model (B =7.9, P<5) continuity of the model and involvement in agribusiness (B=10.73, P<1). The study identified gender disparity and limited access to finance as key barriers to savings participation. Since women often face restricted access to formal financial services, adapting CBSGs to be more gender-inclusive could enhance participation.

**Key words:** Rice farmers, Saving participation community-based group, Profit on investment.

## INTRODUCTION

Agriculture remains a key component of the Nigerian economy contributing to about 25% of the nation's Growth Domestic Products (GDP) in 2024 (Gomina et al., 2024) employing about two-third of the work force (Okunlola & Ayetigbo, 2024) and accounting for about 5% of total exports (Ikuemonisan, 2024). At independence, the population of Nigeria was about 45 million and 13$^{th}$ among the nations of the world. Nearly six decades later, this has skyrocketed to more than 200 million and 7$^{th}$ among the global rankings (Ibrahim Amoo, 2024) The estimation is that by 2050, Nigeria will be among the top three most populated countries in the world (Ukachukwu et al., 2024). With these statistics, it will be difficult for everybody to get white collar job, and food production need to be significantly increased to meet with the ever-increasing population.

While agriculture is one of the backbones of Nigeria's economy, most of its activities are concentrated in crop production, accounting for 90% of the sector's output (Sanusi, et al., 2025). Rice is a staple food for billions of people worldwide, including Nigeria, where over half of the population depends on it as a primary food source. Nigeria is a significant player in rice production within Sub-Saharan Africa (SSA), contributing to the region's overall rice output (Wudil et al., 2023). Rice farming is the backbone of agrarian livelihoods in Jigawa State, Nigeria, where over 80% of the population depends on agriculture, and approximately 150,000 hectares are cultivated annually for rice production (Aminu et al., 2017). Despite this vast potential, smallholder rice farmers face persistent challenges in transitioning from subsistence farming to commercially viable agri-businesses. A critical barrier is the limited adoption of structured savings and investment mechanisms at the community level,

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which could enable access to capital for innovations such as improved seed varieties, irrigation technologies, and post-harvest processing (Ojo et al., 2022). While government programs and NGOs have promoted interventions like the System of Rice Intensification (SRI) and cooperative financing models (Propcom+, 2023), their uptake remains uneven, raising questions about the socioeconomic factors influencing farmers' participation in community-based savings and investment systems.

Existing studies on agricultural finance in northern Nigeria have primarily focused on credit access (Abdulrahman and Abdullahi, 2020) or standalone interventions like subsidy programs (Shehu et al., 2021), neglecting the role of collective savings and investment behaviors in sustaining agri-business growth. In Jigawa, where rice farmers operate within tightly knit communities, informal savings groups (*adashi*) are common but rarely evolve into formalized investment channels due to gaps in financial literacy, gender disparities in resource control, and inadequate institutional support (Lawson, 2015). For instance, while Propcom+ (2023) reported a 30% yield increase among farmers using SRI in Jigawa, less than 15% reinvested profits into scalable enterprises, highlighting a disconnect between income generation and agri-business expansion. Without addressing these barriers, efforts to reduce poverty and food insecurity through rice farming may remain unsustainable. This study contributes to the literature in three key ways. *First*, it identifies the socioeconomic determinants (e.g., education, cooperative membership, land tenure) shaping community-based savings and investments, offering empirical evidence from Jigawa's rice-producing communities a region underrepresented in agri-finance research. *Second*, it bridges the gap between micro-level savings practices and macro-level agri-business development by analyzing how collective investment models can enhance resilience to climate shocks and price volatility (Owusu-Peprah, 2024). *Third*, the findings will inform policymakers designing tailored interventions, such as Nigeria's National Agricultural Technology and Innovation Policy (NATIP), which prioritizes farmer-led financial inclusion (Federal Ministry of Agriculture, 2021). By aligning community practices with institutional frameworks, this study supports Sustainable Development Goals (SDGs) 1 (no poverty) and 2 (zero hunger) in resource-constrained agrarian economies. The goal of the study is to evaluate socioeconomic Determinants of Community-Based Agri-Business Savings and Investments Among Smallholder Rice Farmers in Jigawa State, Nigeria.

**Explanation of the Model**

The model is design to train rice farmers on the promotion of savings culture for future agricultural production. This will reduce over reliance on informal loan which is exploitative and increase farmers capital formation for diversification and enlarging their scale of production. The model was tested on 100 participants in some selected communities across the state. To identify the participants for the pilot study, a two-stage sampling technique was used in selecting the sample for the study. The first involved purposive selection of one local government each from the 4 agricultural zones in the state, mainly due to high rice production. In the second stage, one community was selected purposively also due to high rice production. Similarly, in each community, one registered farmer group was selected. In the final stage, 25 members were randomly selected from each association to make the sample size of 100 participants. These farmers were train and closely guided to implement it.

## MATERIALS AND METHODS

**Study area**

The study was conducted in Jigawa State. The State has a land area of 23,154 square kilometers with a population of 4,988,888 people which comprised mainly of Hausa, Fulani, Mangawa and Kanuri. It is located in the north western part of the country between latitude 11° 00 and 13° 00 North and longitude 8° 00 and 10°15 East. Kano and Katsina States shares border with it to the west, Bauchi State to the east and Yobe State to the northeast. Jigawa State shares an international border with Republic of Niger, which is a unique opportunity for cross border trading activities. There is a Free Trade Zone of Maigatari. The people depend mainly on agriculture for their livelihood specializing in arable and livestock farming. Agricultural produce includes grains such as maize, millet, rice and Guinea corn. Similarly, groundnut, cowpea, sesame, and hibiscus are also grown. Live-stock are important aspect of the economy. The state has 27 Local Government Areas with capital at Dutse.

**Sampling Techniques and Sample size**

The model was tested in Jigawa state using the rice farmers as a trial. A multi-stage sampling technique was used in selecting the sample for the study. The state is divided into four agricultural zones by the state Agricultural Development Programme (ADP). One Local Government Area was purposely selected in each zone due to concentration of rice farmers in the area. In each LGA selected, one community was also selected due to same reason. In each community, one registered farmer group was selected for the trial. The list of the members of the associations formed the sampling frame. In the second stage, 25 members were randomly selected from each association which made the sample size of100 farmersobtained from four villages for the study. These farmers were trained on the model and closely guided on how to implement it.

In Hadejia agricultural zone Auyo local government area was selected purposely due high number of rice farmers and Auyo cikin gari community was also purposely selected as a result of high concentration of

rice farmers in the area while for the Ringim agricultural zone Ringim local government area, Ringim Dabi was also selected based on high concentration of rice farmers in the area. Moreover, for Dutse agricultural zone Kiyawa local government area was selected and kiyawa community was also selected due high number of rice farmers in the area. Finally, in Kazaure agricultural zone Kazaure Gada community was also selected due high number of rice farmers in the area. In four communities that were selected 25 farmers from each community were selected through the use of random numbers making a total sample size of 100 farmers.

**Method of Data Collection / Analysis**

Data was collected with the aid of questionnaire, interview, and participatory survey. The specific techniques used includes; focus group discussions, direct observation, and direct consultation with key informants. Data was analyzed using descriptive statistics and multiple regression. The descriptive statistics involves the use of means, frequencies, percentages and charts while the multiple regression involves the use of a dependent variable with six independent variables which is explicitly expressed as follows:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \varepsilon$$

Where:

$Y =$ Amount of savings by farmers (₦)
$X_1 =$ Income generated (₦)
$X_2 =$ Profits on investment (₦)
$X_3 =$ Yield in kg
$X_4 =$ Acceptability of the model (1=accept 0=reject)
$X_5 =$ Continuity of the model (1=continue 0= not continue)
$X_6 =$ Involvement in agribusiness (1= yes 0= no)
$\varepsilon = Error\ term$

## RESULTS AND DISCUSSION

**Socioeconomic Characteristics**

Socioeconomic Characteristics shows a highly skewed gender distribution among rice farmers in Jigawa State, with an overwhelming majority being male (82%) and a smaller proportion being female (18%).This is in accordance with Agarwal (2014) indicating dominance of male farmers in the area. This also agrees with the studies of Abdu et al. (2023) that female farmers likely face substantial barriers to accessing critical resources such as land, credit, improved seeds, fertilizers, and extension services. These barriers are often rooted in cultural norms, patriarchal land tenure systems, and lack of collateral which can severely limit their productivity and income potential. Majority of rice farmers in Jigawa State fall within the economically active age groups, with the largest proportions being between 30-39 years (25%) and 40-49 years (24%), collectively accounting for almost half (49%) of the farming population. The mean age of the respondents is found to be 41 years.

Table 1 indicates that the overwhelming majority of rice farmers in Jigawa State (65%) have household sizes ranging from 5 to 10 members. The mean household size was found to be 1 people. Household size can influence decisions on resource allocation, such as the amount of land cultivated, types of crops grown, and adoption of technologies. Households with more labor might be more inclined to cultivate larger areas or crops that require significant manual input, potentially neglecting more capital-intensive, high-yield options (Ikehi et al., 2017). The result reveals that a significant majority of rice farmers in Jigawa state have a Qur'anic

**Table 1:** Socio-economic characteristics

| Gender | Frequency | Percentages |
|---|---|---|
| *Male* | *82* | *82* |
| *Female* | *18* | *18* |
| Age | | |
| *<20* | *8* | *8* |
| *21-30* | *18* | *18* |
| *31-40* | *25* | *25* |
| *41-50* | *24* | *24* |
| *51-59* | *16* | *16* |
| *>59* | *9* | *9* |
| Mean age | | *40.2* |
| Household size | | |
| *<5* | *18* | *18* |
| *5-10* | *65* | *65* |
| *11-15* | *8* | *8* |
| *16-20* | *5* | *5* |
| *21-25* | *3* | *3* |
| *>25* | *1* | *1* |
| Mean household size | | *11.6* |
| Educational Level | | |
| *Qur'anic* | *56* | *56* |
| *Primary* | *19* | *19* |
| *Secondary* | *15* | *15* |
| *Tertiary* | *8* | *8* |
| *Others* | *2* | *2* |
| Farming experience | | |
| *<10* | *22* | *22* |
| *10-19* | *54* | *54* |
| *20-29* | *14* | *14* |
| *30-39* | *6* | *6* |
| *>40* | *4* | *4* |
| Mean farming experience | | *16.1* |
| *Farm size (ha)* | | |
| *< 1* | *61* | *61* |
| *1 – 2* | *21* | *21* |
| *3 – 4* | *10* | *10* |
| *4 – 5* | *5* | *5* |
| *>5* | | |
| *mean* | | *1.9* |
| Annual Income | | |
| *<200,000* | *61* | *61* |
| *200,000 - 300,000* | *21* | *21* |
| *300,001 – 400,000* | *10* | *10* |
| *400,001 – 500,000* | *5* | *5* |
| *>500,000* | *3* | *3* |
| Mean | | *218,000* |

Source: Field Survey, 2025

education (56%), followed by primary education (19%). Farmers with secondary education are 15%, while those with tertiary education constitute a small minority (8%). "Others" account for 2%. This suggests a relatively low level of formal Western education among the rice farming population, with traditional religious education being the dominant form.

Table 1 shows that the majority of rice farmers in Jigawa State have moderate to farming experience. The largest group (54%) has between 11 and 19 years of experience, followed by those with less than 10 years (22%). The mean farming experience is 16 years. Highly experienced farmers may sometimes exhibit risk aversion, preferring to stick with proven methods rather than adopting new, potentially higher-risk technologies, especially if their livelihoods are precarious (Simtowe et al., 2016). The result in Table 1 indicates that the vast majority of rice farmers in Jigawa State are smallholders. A high percentage 61% cultivate less than 1 hectare, and another 21% cultivate between 1 and 2 hectares. This means 82% of rice farmers operate on 2 hectares or less. Only a very small proportion (3%) cultivates more than 5 hectares. This finding confirms the typical agricultural landscape in many parts of Nigeria, dominated by smallholder farmers. Their operations are often characterized by low capital investment, reliance on manual labor, and production primarily for subsistence with some surplus for market (Liverpool-Tasie et al., 2020). Table 2 reveals that a significant majority of rice farmers in Jigawa State operate on very low incomes. 61% of farmers earn less than ₦200,000 annually, and another 21% earn between ₦200,000 and ₦300,000. This means 82% of farmers earn less than ₦300,000 per year. Only a very small fraction (3%) earns more than ₦500,000. (Note: As of May 2025, ₦200,000 is approximately $130 - $140 USD depending on the current exchange rate, which is a very low annual income, signifying significant poverty).

**Farmers Reasons for Saving Money**

Based on the information provided in Table 2, farmers in the study area save money for a variety of reasons, with medical emergencies and farm inputs being the most significant motivations. The total percentage exceeds 100% because farmers could provide multiple responses, indicating they save for more than one purpose. The data suggests a strong emphasis on both productive and protective savings among farmers. The highest percentage is for medical emergencies (90%), indicating that farmers prioritize having a financial safety net for health-related issues. This is a crucial protective measure, as unexpected illnesses or accidents could otherwise be financially devastating. The second highest percentage is for farm inputs (89%). This highlights the importance of capital for agricultural productivity. Saving for inputs like seeds, fertilizer, and tools ensures the continuation and potential growth of their farming operations.

**Table 2:** Distribution of farmers on why they save money in the study area.

| Reasons for Savings | Percentage |
|---|---|
| Farm inputs | 89 |
| Purchase Livestock | 54 |
| Household expenses | 74 |
| Festivals | 80 |
| Medical emergencies | 90 |
| Others | 35 |
| Total | 422* |

Source: Field Survey, 2025
*Multiple responses exist

Festivals (80%) and household expenses (74%) are also significant reasons for saving. These percentages show that farmers are also concerned with maintaining their social and domestic obligations. Saving for festivals suggests the importance of social and cultural participation, while saving for household expenses points to the need for financial stability to cover day-to-day living costs.

The lower percentages for purchase of livestock (54%) and others (35%) suggest these are fewer common reasons for saving compared to the top four. While livestock can be a form of savings or investment, it appears to be a secondary goal for most farmers in this study. The "others" category, with its low percentage, likely includes a wide range of less common or unique reasons for saving

**Regression Results for Effect of some Variables on Amount of Savings**

Table 3 indicates that the dependent variable is the amount of savings by farmers (₦) while the independent variables were $X_1$ income generated, $X_2$ profits on investment, $X_3$ yield, $X_4$ acceptability of the model $X_5$ continuity of the model and $X_6$ involvement in agribusiness. The R-squared indicates that about 97.93% of the variation in the "amount of savings by farmers" can be explained by the independent variables included in your model. The Adjusted R-squared suggests that about 97.16% of the variance in savings is explained by the predictors, accounting for the number of variables. This indicates that the model is fit. The F- statistics of 2468.407 indicates that the overall variables included in the model are jointly and statistically affecting the dependent variable. The constant shows that it's highly statistically significant indicating that the estimated amount of savings when all independent variables are zero it remains ₦2468.407. The results indicated that $X_1$ which is income generated, for every ₦1 increase in income generated, the amount of savings by farmers is estimated to increase by ₦5.95. It suggests that "Income generated" has a positive influence on savings, but it's not as strong as some other variables and it is statistically significant at 10%. For $X_2$ which is profits on investment it shows that for every ₦1 increase in profits on investment, the amount of savings by farmers is estimated to increase by ₦0.00378 and is

**Table 3:** Regression Results for Effect of some Variables on Amount of Savings

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| C | 2468.407 | 50.44768 | 48.93004 | 0.0000 *** |
| $X_1$ | 5.954161 | 3.311215 | 1.798180 | 0.0910 * |
| $X_2$ | 0.003780 | 0.000978 | 3.865208 | 0.0014 *** |
| $X_3$ | 10.94 | 1.920 | 5.750481 | 0.0001 *** |
| $X_4$ | 7.900512 | 2.704308 | 2.921454 | 0.0100 ** |
| $X_5$ | 17.97675 | 14.60721 | 1.230676 | 0.2362 NS |
| $X_6$ | 10.72.01 | 1.755 | 6.127029 | 0.0000 *** |
| $R^2$statistics | 0.979318 | | | |
| Adjusted $R^2$ | 0.971562 | | | |
| F-statistic | 126.2700 | | | |
| Prob(F-statistic) | 0.000000 *** | | | |
| VIF | 4.75 | | | |

Source: Field Survey, 2025

statistically significant at 1% which indicates that profits on investment" has a statistically significant positive effect on the amount of savings. This is intuitive that higher profits provide more funds that can be saved. For the yield which is $X_3$ the result shows that every 1 kg increase in yield, the amount of savings by farmers is estimated to increase by ₦10867.94and statistically significant at 1%**.** Yield has a positive effect on the amount of savings while $X_4$ which is acceptability of the model indicated that the model is accepted and statistically significant at 5% which indicated that farmers who accept the model tend to have higher savings than those who reject the model. The independent variable continuity of the model which is $X_5$ shows that If farmers intend to continue with the model compared to not continuing, the amount of savings is estimated to increase by ₦17.97 but is statistically insignificant with the sign in the positive direction there is no statistically significant relationship between the intention to continue with the model and amount of savings by farmers. This is in accordance with the a theorical expectation because the model is just introduced issue of continuity may arise in future. The involvement in agribusiness which is $X_6$ shows that If farmers are involved in agribusiness, compared to not involved, the amount of savings is estimated to increase by ₦10972.01 which is highly significantly and statistically affecting the dependent variable at 1% indicating that farmers involving in agribusiness have higher savings than those not involved and could be attributed to involvement in agribusiness leads to higher income, profits and potentially better financial management which will resulted to more savings. The Variance Inflation Factor (VIF) of 4.75 indicated the absence of multi-collinearity in the model which is good for the reliability of the coefficient estimates as indicated in Table 10 below.

To evaluate the impact of the pilot model on participants' financial resilience and agri-business outcomes, the before and after survey by the participating farmers measure of changes in savings behaviour, debts levels, income and investment in business.

**Conclusion**

The study conducted to evaluate the determinants of Savings Participation in Community-Based Savings Groups (CBSGs) Among Smallholder Rice Farmers in Jigawa State, Nigeria. All the four senatorial zones were considered for the study. Data were collected from 100 pilot respondents across the state. The data were analyzed using descriptive statistics and multiple regression analysis. Based on the findings it can be concluded that the farming community faces systemic challenges related to gender disparity, low education, limited access to finance, and small farm sizes. This success highlights that targeted interventions can effectively address the systemic challenges faced by these farmers. The determinants of savings are found to be income generated, profits on investment, yield in kg, acceptability of the model, continuity of the model and involvement in agribusiness. The study identified gender disparity and limited access to finance as key barriers to savings participation. Since women often face restricted access to formal financial services, adapting CBSGs to be more gender-inclusive could enhance participation. Stakeholders should establish women-led CBSG clusters with emphasis on financial literacy training this will improve female participation and promote saving cluster among them.

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**Conflict of interest:** The authors have no conflict of interest to declare.

**Authors contribution:** All authors contributed equally to this research work.

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