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Do Farmer-Based Organizations Shape Welfare? Evidence from Rice-Farming Households in Niger and Nasarawa States, Nigeria

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Over the years, farmer-based organizations have been recognized as a key approach for small-scale farmers to enhance their income and address challenges in agricultural production and marketing. This paper presents a framework for analyzing the effect of membership of farmer-based organizations on the welfare of rice-farming households. The research utilized a multistage sampling technique and a total of 300 rice-farming households were selected. The analytical techniques involved descriptive and inferential statistics, logit regression, and quantile regression. The findings of the logit analysis indicated that education level, farming experience of household head, non-farm income and access to credit were the factors influencing membership in farmer-based organizations. Results of the quantile regression analysis showed that membership of farmer-based organizations had a negative effect on the welfare of rice-farming households and was significant at ($p < 0.1$). Household size and farm size had an inverse relationship with the welfare of rice-farming households and were significant at ($p < 0.001$) across all quantiles. Non-farm income and farming experience all had a positive influence on the welfare of rice-farming households. The study, therefore, recommends that farmers should be encouraged to join and participate in farmer-based organizations. Efforts should also be made to facilitate the formation and sustainability of these organizations.

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INTRODUCTION

In All developing countries across the globe, with the exception of Africa, effectively decreased poverty by half between 1990 and 2015, achieving an essential Sustainable Development Goal. Knowing that agriculture provides the majority of Africa's economically disadvantaged with a means of livelihood, increasing agricultural productivity, profitability, and sustainability is regarded as the primary path out of poverty on the continent (Musa & Mesfin, 2017). Farming households account for 85% of all farms globally, and the people who live on them comprise the vast bulk of the rural poor. These farming households join associations to address the obstacles of operating alone while also increasing profitability and efficiency (IFAD, 2024). In Nigeria, the majority of smallholder farmers live in rural regions and frequently endure low livelihoods and living conditions. Promoting institutional frameworks, such as farmer-based organizations, has been advocated as a key strategy for resolving the restrictions that prevent smallholders in developing countries from taking advantage of agricultural production and marketing capacity.

According to Esham (2012), farmer-based organizations (FBOs) are groups that represent farmers within a specific region and focus mainly on agribusiness activities. They mainly include farmers' associations, farmer cooperatives, farmer clubs, farmer groups, producer organizations, and women's groups. Some of the benefits of belonging to a farmer-based organization have been identified

as strengthening farmers' negotiation abilities in the markets to gain more competitive prices for both inputs and outputs, reducing transaction costs and information asymmetry, and improving agro-food safety and quality standards (Ma & Abdulai, 2016). Due to the significant role that farmer-based organizations play in promoting rural development, many organizations have partnered with these FBOs over the years. For instance, the International Fund for Agricultural Development (IFAD) has been able to recognize the importance of farmer-based organizations in smallholder development and has been committed to building their capacity and strengthening their institutions to perform through the channelling of funds in these organizations (IFAD, 2024).

Existing studies suggest that farmer-based organizations can help boost the productivity, income and food security of farming households (Afolami, Obayelu, Agbonlahor, & Lawal-Adebowale, 2012; Kehinde & Ogundeji, 2022; Kehinde & Kehinde, 2020; Rahmadanih, Bulkis, Arsyad, Amrullah, & Viantika, 2018; Wanglin & Abdulai, 2016; Fasakin & Popoola, 2019). The majority of these studies have been conducted outside Nigeria, however, there is no comprehensive understanding of how membership in farmer-based organizations affects the welfare of rice-farming households, especially in Niger and Nasarawa states.

This paper, therefore, seeks to add to the expanding body of literature on the influence of farmer-based organizations by exploring its effects on household

welfare. The study's specific objectives are to identify the various farmer-based organizations in the study area; assess the various factors influencing the membership of farmer-based organizations; and examine how membership of these organizations influences the welfare of rice-farming households in the region.

LITERATURE REVIEW

Concept of Farmer-based organizations

Farmers saw the need to organize into groups to share common assets like labour, land, and water, and to respond to market pressures like pricing and market accessibility. This is how Farmers' Organizations (FOs) came to be around the world. Input supply, consulting services, and loan availability are all examples of other needs of farmers (Wennink, Nederlof, & Heemskerk, 2007). According to Chilongo (2005), cooperatives constituted the majority of farmers' groups in Sub-Saharan Africa (SSA) prior to the liberalization era.

Nonetheless, government orders were used to establish and run the majority of these cooperatives. However, the majority of cooperatives became weak, inactive, or even extinct since they were unable to compete in free-market economies. According to Abaru, Nyakuni, and Shone (2006), the loss of agricultural organizations such as cooperatives has left farmers without a unified voice. As a result, farmers lacked access to reasonably priced supplies and technologies. Subsequently, many small-scale farmers continue to live in poverty and are unable to participate in policies that impact their well-being; hence, the creation of farmer-based organizations became necessary.

Even while cooperatives can have issues, working together as a group to find solutions to challenges is often regarded as one of the main strategies for enhancing the welfare of small-scale farmers (Grigoryan, Hakhnazaryan, & Kwapong, 2008). One crucial instrument for ensuring smallholder

farmers raise their standard of living is the creation of FOs (Msuta & Urassa, 2015). Additionally, as individuals living in rural regions with little population with inadequate infrastructure, small-scale farmers may be easier to reach by sponsors through FOs; this could simplify aid in the form of grants or loans that can help these farmers strengthen their quality of life (Bachke, 2009).

Social Capital Theory

Theorists, decision-makers, and community groups have all paid close attention to social capital theory as a means of evaluating and comprehending the connection between social networks and collective action (Bartecchi, 2021). According to Putnam as cited in Bartecchi (2021) social capital can be defined as social organization features, like networks, norms, and social trust, that facilitate coordination and cooperation for mutual benefit. Social capital theory was founded on the premise that individuals are “embedded” in a network of social relations that influence decisions and actions (Bartecchi, 2021). The social capital theory postulates that people derive value from their interpersonal relationships because they offer resources that may be employed to accomplish goals (Bizzi, 2015). According to Fiorini, Seles, Jabbour, Mariano, and Jabbour (2018), social capital theory (SCT) was first defined by Bourdieu in 1985 as the aggregate of the actual or potential resources which are linked to the possession of a durable network of more or less institutionalized relationships of mutual acquaintance or recognition.

According to Kashim (2018) using Social capital theory, Hanifan elucidated how the rural school community members build their social capital to enhance academic performance. He added that social capital theory has been used in the business world to illustrate how underprivileged individuals build their social capital and gain access to resources to enhance the operation of their businesses. Networkers are more likely to achieve more and build up their social capital than non-networkers (Kashim, 2018). Therefore, this theory

shows how farmer-based organizations play a crucial role in enhancing social cohesion, knowledge sharing, and collective action within rural communities by fostering networks of trust, reciprocity, and cooperation among farmers. This theory emphasizes the importance of collective networking and the joining of resources to help achieve both individual and collective goals.

METHODOLOGY

Study Area

The study was carried out in Niger and Nasarawa States, Nigeria. Niger and Nasarawa states are in the country's north-central area. The population of Niger State in the year 2019 was 6,220,617 and that of Nasarawa was 2,632,239 (National Bureau of Statistics [NBS], 2019). Agriculture is the backbone of Niger and Nasarawa State's economy, with the primary economic activities being farming, fishing, and cattle rearing.

Sampling Technique

A multi-stage sampling technique was employed to select respondents for this study. Firstly, one Local Government Area (LGA) was purposively chosen from each of the three (3) zones in both Nasarawa and Niger States, due to the prominence of rice production in these areas. The selected LGAs were Lafia, Wamba, and Doma in Nasarawa, and Wushishi, Katcha, and Bosso in Niger, totalling six (6) LGAs. In the second stage, five (5) villages were randomly selected from each LGA, amounting to thirty (30) villages. Finally, ten (10) rice-farming households were randomly chosen from each of the 30 villages, resulting in a sample of 300 rice-farming households. Data was collected using Computer-Assisted Personal Interviewing (CAPI) technology via Kobotoolbox. The study population comprised rice-farming households and the sample frame was 1,210 registered rice-farming households. This information was sourced from the Agricultural Development Program (ADP) of both states.

Model specification

Descriptive and inferential statistics were employed in this study. The logit regression and quantile regression models were employed in this study.

Logit Model

This model was utilized to assess the factors that influence membership of farmer-based organizations of rice-farming households in the study area. The dependent variable is the choice to join a farmer-based organization coded as 1. In contrast, non-membership of farmer-based organizations was coded 0.

Given that $P_i = \frac{e^{x_i}}{1+e^{x_i}}$ Where e is the base of the natural logarithm, and P_i is the probability that the farming household decides to join a farmer-based organization, $1 - P_i$ is the probability that the farming household chooses not to join a farmer-based organization. The prediction equation for individual farmers' production choices is obtained from natural logarithms as indicated by Muroiwa, Mushunje and Musitini (2018) equation below;

$$\ln\left(\frac{P_i}{1-P_i}\right) = \beta_0 + \sum_{i=1}^n \beta_i X_{ki} = Z_i \quad (1)$$

P_i = odds ratio of a farmer's decision to join a farmer-based organization.

In this study, the logit regression model for the farming household's head decision to be a member of a farmer-based organization is as expressed below:

$$P(Y = 1 | X) = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 + \beta_9 X_9 + \beta_{10} X_{10} + \beta_{11} X_{11} + \mu \quad (2)$$

β_0 = intercept

$\beta_1, \beta_2, \beta_3, \dots, \beta_i$ = coefficients of the independent variables.

$X_1, X_2, X_3, \dots, X_k$ = independent variables (socio-economic, institutional, and technical factors and other household characteristics) that are likely to influence the individual farming households' head decision to become members of farmer-based organizations, namely;

X_1 = Education level of household head (years)

X_2 = Farming experience of household head (years)

X_3 = Household size (number of people in the household)

X_4 = Farm Size (number of hectares)

X_5 = Farm income (Naira)

X_6 = Non-farm income (Naira)

X_7 = Microcredit (Dummy: 1 = if yes, 0 if otherwise)

Quantile Regression

This model was used to examine the influence of membership of farmer-based organizations on Rice-farming households' welfare in Niger and Nassarawa states. Another term for it is percentile and the model is specified below;

$$Q_r(y_i/x_i) = x_i\beta_r \quad (3)$$

$$Q_r(y_i) = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \beta_5X_5 + \beta_6X_6 + \beta_7X_7 + \beta_8X_8 + \beta_9X_9 + \beta_{10}X_{10} + \beta_{11}X_{11} + \beta_{12}X_{12} + \beta_{13}X_{13} + U_i$$

(4)

Where

Q_r = quantile of dependent variable (10th, 25th, 50th, 75th, 90th)

Y_i = Welfare (Per Capita Expenditure)

X_1 = Membership of farmer-based organizations (1 if a household rice farmer is a member, 0 otherwise)

X_2 = Household size (number of people living under the same roof with the household head and eating from the same pot)

X_3 = Rice farm size (Hectares)

X_4 = Farm income (Naira)

X_5 = Non-farm income (Naira)

X_6 = Education level of household head (Number of years spent in school)

X_7 = Farming experience (number of years spent in farming)

Household Welfare Measurement

While other indicators of measuring household welfare include true welfare indexes, total household expenditure and total household income, this study utilized the Per Capita household Consumption Expenditure (PCE) as a measure of household welfare, similar to earlier studies on welfare in Nigeria by Okezie, Teran, and Enete (2021); Okunmadewa et al. (2010); and Omonona (2001); and in the other parts of the world Lin, Wang, Gan, and Nguyen (2019); Muayila and Tollens (2012); Rui and Xi (2010); Tran, Gan, and Baiding (2016).

Therefore, the per capita expenditure is denoted as:

$$\frac{\text{Total household consumption expenditure}}{\text{No. of members of household}} \quad (5)$$

RESULTS

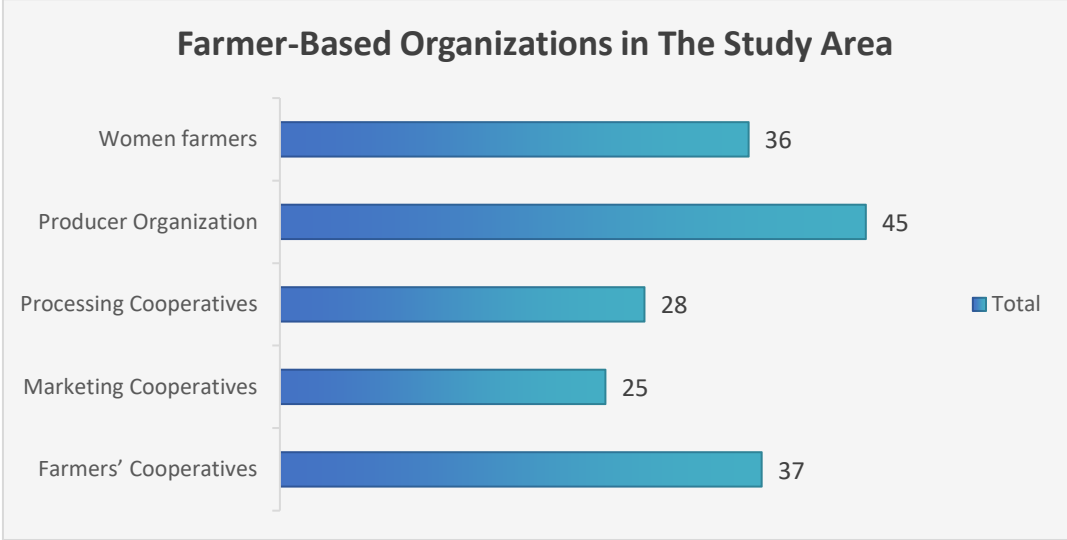
Membership of Farmer-Based Organizations of the Respondents

According to Figure 1, the various farmer-based organizations rice-farming households belonged to in the study area include producer organizations, farmers cooperatives, processing cooperatives, marketing cooperatives and women farmers groups. Producer Organizations represent the largest group. These organizations likely focus on enhancing the production capacity of farmers by providing

resources, knowledge, and collective bargaining power for inputs. Producer organizations are the most prominent among the farming households, followed closely by farmers' cooperatives and women farmers' groups. Processing and marketing cooperatives have smaller but still significant

memberships. The membership distribution suggests that collective production efforts and access to markets are key drivers of participation in FBOs, with women also playing a significant role through gender-specific organizations.

Figure 1: Farmer-Based Organisations of Rice Farming Households in the Study Area.



Source: Computed from field data, 2024

Factors influencing the membership of farmer-based organizations among Rice farming households in the study area

Table 1 presents the results of the logit regression estimates on factors influencing the membership of farmer-based organizations by the respondents in the study area. The diagnostic statistics showed the wald chi2 (7) value of 26.20, prob<chi2 of 0.000, and log pseudolikelihood of -190.13 suggesting that the model was a good fit. The analysis found that only 4 variables out of the 7 independent variables were significant and they include: education level, farming experience, non-farm income and microcredit.

The estimation result showed that education had a significant positive effect on the membership of farmer-based organizations of rice farming households in the study area. Education was significant at ($p<0.01$) suggesting that an increase in one year in formal education increased the

probability of farming households becoming members of a farmer-based organization by 0.181. Farmers with more years of education are more likely to join FBOs. This could be due to the fact that more educated farmers are better able to understand the benefits of membership, such as access to information, training, and resources. This aligns with the findings of Rwela (2023) who also reported that farmers who had received formal education were more likely to become members of a farmer-based organization than those who had not.

Farming experience had a positive and significant effect on membership, suggesting that for each additional year of farming experience, the probability of joining a farmer-based organization increases by 0.007. A possible explanation could be that more experienced farmers may recognize the value of collective action in farmer organizations. They are likely to join for the benefits of shared knowledge, risk management, and collective

bargaining for inputs or market access. This aligns with the findings of Mbagwu (2018) who suggested that with farming experience, the farmers are aware of the numerous benefits emanating from being members.

Non-farm income had a negative and significant effect at $P < 0.05$, suggesting that farmers who earn more income outside of farming are less likely to join farmer-based organizations. A possible explanation could be that farmers with higher non-farm income may not see the need to join these organizations, possibly because they are less reliant on farming as their primary income source or less involved in farming activities. Access to microcredit was also negative and significant at $P < 0.05$. This suggests that access to microcredit decreases the probability of joining a farmer-based organization. Farmers who can access microcredit independently may feel less need to join farmer-based organizations, as one of the key incentives for joining is often access to financial support and resources. This could also indicate that farmer-based organizations are seen as substitutes for formal credit in some cases.

Table 1: Logistic estimates showing the factors influencing the membership of farmer-based organisations of Rice farming households in the Study Area

Variables		Coefficients	dy/dx	Robust Std. Err	z
Education level (Years)	β_1	0.074***	0.181	0.025	2.88
Farming experience (Years)	β_2	0.031**	0.0076	0.013	2.39
Household size	β_3	-0.0112	-0.002	0.028	-0.39
Farm size(hectares)	β_4	0.26	0.063	0.925	0.28
Farm income (Naira)	β_5	-1.47e-06	-3.58e-07	4.74e-06	-0.31
Non-farm income (Naira)	β_6	-9.88e-06**	-2.41e-06	4.36e-06	-2.27
Microcredit	β_7	-0.523**	-0.12	0.248	-2.11
Diagnostic Statistics					
Number of observations		300			
Wald chi2(11)		26.20			
Prob<chi2		0.000			
Pseudo R2		0.0725			
Log pseudolikelihood		-190.13			

(+) is dummy variable from 0 to 1, *** significance at 1% level; ** significance at 5% level; * significance at 10% level.

Source: Computed from field data, 2024

Welfare levels (Per Capita Consumption Expenditure) of Rice-farming Households in the Study Area

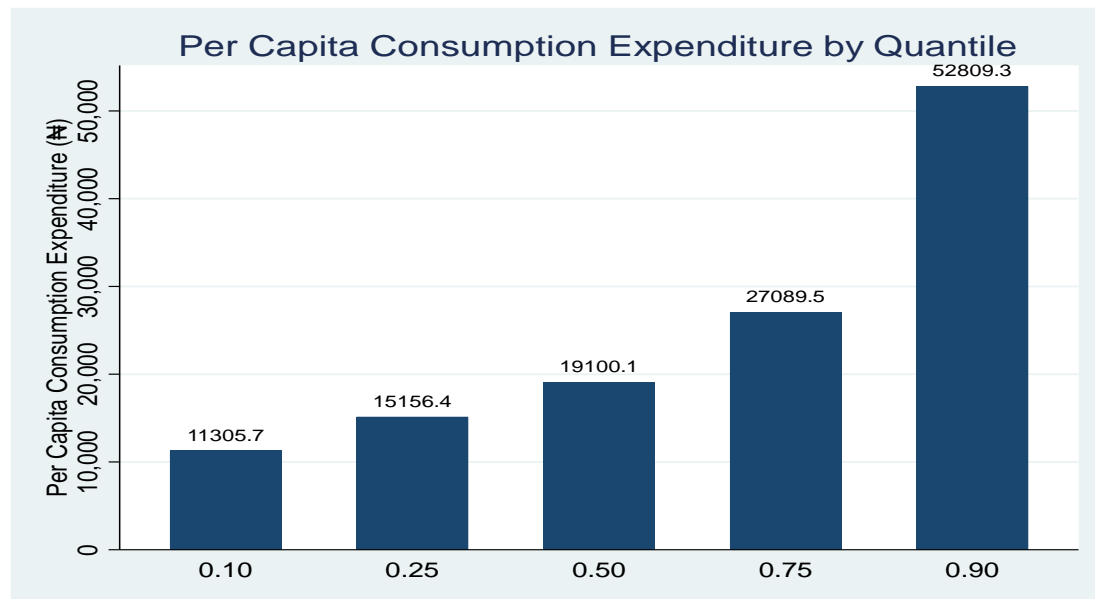
Per capita consumption expenditure is a crucial indicator of household welfare and economic well-being, offering insights into the living standards and consumption patterns within a household. Figure 2 shows the distribution of per capita consumption expenditure of rice farming households across various quantiles. The result showed that households at the 10th and 25th percentiles had relatively low consumption expenditure, indicating low welfare levels. The per capita consumption expenditure of rice farming households at the 10th and 25th percentiles were ₦11,305.7 and ₦15,156.4 respectively. These figures underscore the economic challenges faced by a considerable portion of the population, reflecting low welfare levels and limited financial resources. Such households are likely struggling to meet basic

needs, which could have implications for their overall well-being and ability to invest in productive activities.

The per capita consumption expenditure at the 50th percentile, also known as the median, was found to be ₦19,100.1. This median value indicates a medium level of welfare for the rice-farming households in the study area.

At the higher end of the distribution, households at the 75th and 90th percentile per capita consumption expenditure was ₦27,089.5 and ₦52,809.3 respectively, indicating high welfare levels. These higher percentiles highlight a segment of the population with relatively greater financial stability and higher welfare levels. The substantial difference between the 75th and 90th percentiles indicates that a smaller proportion of households enjoy markedly better living standards, characterized by higher consumption and presumably greater access to resources and opportunities.

Figure 2: Distribution of respondents by the per capita consumption expenditure



Source: Computed from field data, 2024

Effect of Membership of Farmer-Based Organizations on the Welfare of Rice Farming Households in the Study Area

Quantile regression analysis was utilized to evaluate the variables that affect the respondents' household welfare proxied by per capita consumption expenditure in relation to FBO membership. Table

2 presents the analysis findings. It showed that five out of the seven explanatory variables which include FBO membership, household size, farm size, non-farm income, and farming experience were significant. Table 3.2 displays the quantile regression estimates for the 10th, 25th, 50th, 75th, and 90th percentiles. Table 3.2 also showed Pseudo R² of 0.5100, 0.5733, 0.6244, 0.6707 and 0.6835 for the 10th, 25th, 50th, 75th and 90th percentiles respectively, showing measures of goodness of fit. The value of the Pseudo R² increases with the percentile, indicating that the model explains a higher percentage of variability at higher percentiles.

The coefficient of membership of farmer-based organizations was significant and negative at the 10th, 50th and 75th percentiles, respectively, indicating that an increase in membership of a farmer-based organization is associated with a decrease in the consumption of expenditure of rice-farming households. However, the magnitude of the effect was higher at the lower quantile (10th percentile) indicating that an increase in membership of FBO will decrease household consumption expenditure by 0.063. This is consistent with the findings of Mignouna et al. (2015) who also found a negative association between households who were members of an association and their consumption expenditure, suggesting that households who belonged to a farmers' organization had low welfare for households at the 25th quantile. This result, however, is in contrast to a prior expectation and several other literature like Manda et al. (2021) that found a positive relationship between membership of FBO and household consumption expenditure. This explanation suggests that while farmer-based organizations (FBOs) provide various benefits, the costs associated with participating in and maintaining these groups can outweigh the benefits for some farming households. Specifically, households in the lower distribution of welfare (10th percentile) might struggle to bear these additional costs, leading to a negative effect on their

overall expenditure. This financial strain could deter these households from participating in FBOs, thus affecting their potential to reap the associated benefits.

Additionally, the coefficient of household size was negative and had more magnitude effect at the upper quantile (90th percentile) and significant at ($p < 0.01$) across all quantiles, indicating that an increase in the number of persons in a household is associated with a decrease in household consumption expenditure by 0.125. This result aligns with the findings of Hastuti, Darma, Salman, Santosa, and Rahmadanih (2021) who hypothesized that a negative household size coefficient indicated that large households often incurred lower levels of per capita consumption expenditures. Larger families are typically poorer since they spend less per person per family, according to Lanjouw and Ravallion, as cited in Hossain and Al-Amin (2018). One explanation for this result would be that most household members are dependents and make no contributions to the household's revenue.

The coefficient of farm size was negative and significant at ($p < 0.1$) at the 90th quantile, indicating that an increase in the number of hectares of land reduces the consumption expenditure of rice farming households by 0.257. The implication of this could be that as farm size increases, the cost of operating the farm (e.g., labour, inputs, machinery) may rise, potentially reducing the amount of disposable income available for household consumption. Farmers with larger farms might reinvest more of their income into expanding or maintaining the farm rather than using it for household consumption. This is in agreement with the findings of Mignouna et al. (2015) who stated that as farms increase in size, there is an increased need for farm inputs which leads to an increase in expenditure.

Furthermore, the coefficient of non-farm income was positive and significant at ($p < 0.05$) at the 10th and 25th percentile while the magnitude of effects was higher at the 10th quantile, indicating that an

increase in non-farm income increases the consumption expenditure of rice farming households. This finding is consistent with that of Hossain and Al-Amin (2018). This suggests that households with a strategy of income diversification through non-farm activities are more likely to experience greater levels of consumption (Okezie et al., 2021).

The coefficient of farming experience was positive and significant at ($p < 0.01$) across all quantiles but had more magnitude of effect at the 10th percentile, showing that an increase in the farming experience of a household head is associated with a 0.0074 increase in the consumption expenditure of the household. This suggests that experienced farmers are likely to possess better agronomic practices, crop management techniques, and risk mitigation strategies, leading to higher productivity, efficiency, and profitability in agricultural activities. This agrees with the findings of Hossain and Al-Amin (2018) who stated that with greater experience comes more income for the head of the household which allows him to put more money down to meet the needs of the family.

Table 2: Quantile regression of the Influence of Membership of Farmer-Based Organizations on the welfare of Rice Farming Households in the Study Area

Explanatory variables	0.10		0.25		0.50		0.75		0.90	
	Coefficient	t value	Coefficient	t value	Coefficient	t value	Coefficient	t value	Coefficient	t value
+Membership of FBOs	-0.063** (0.045)	-1.83	-0.029* (0.035)	-1.14	-0.024* (0.029)	-1.59	-0.043* (0.03)	-1.82	-0.02 (0.483)	-0.71
Household size	-0.104*** (0.008)	-12.37	-0.1*** (0.004)	-14.69	-0.108*** (0.0043)	-23.78	-0.118*** (0.003)	-43.83	-0.125*** (0.003)	-35.07
Farm size	0.129 (0.159)	0.97	0.11 (0.095)	0.89	0.104 (0.067)	0.84	-0.109 (0.12)	-1.05	-0.257* (0.15)	-1.62
Farm income	-4.52e-07 (8.32e-07)	-0.64	-4.13e-07 (6.13e-07)	-0.64	-1.74e-07 (4.03e-07)	-0.23	4.87e-07 (6.62e-07)	0.84	1.04e-06 (7.59e-07)	1.24
Non-farm income	1.43e-06** (8.58e-07)	1.75	1.12e-06** (4.71e-07)	2.64	4.18e-07 (4.29e-07)	0.85	1.04e-08 (8.59e-07)	0.02	3.15e-09 (5.11e-07)	0.01
Education	0.007 (0.0032)	1.31	0.003 (0.0035)	1.15	0.0032 (0.0036)	0.93	0.0001 (0.0049)	0.07	-0.002 (0.0055)	-0.56
Farming Experience	0.0074*** (0.0024)	4.66	0.005*** (0.0015)	5.12	0.003** (0.001)	2.51	0.003*** (0.002)	4.08	0.0038** (0.021)	2.43
Pseudo R ²	0.5100		0.5733		0.6244		0.6707		0.6835	

*** significance at 1% level; ** significance at 5% level; * significance at 10% level. Figures in parentheses are robust standard errors.

Computed from field data, 2024

CONCLUSION

According to the findings of this study, the study showed that indeed membership of farmer-based organisations had an influence on rice farming households' welfare. Therefore, the following recommendations are presented:

- The empirical result showed that membership of FBO was statistically significant and had a negative effect on household welfare which calls for Government authorities to monitor how these FBOs are operating.
- Efforts should also be made to facilitate the formation and sustainability of these organizations. These organizations should actively promote and encourage farmers' participation through awareness campaigns, community meetings, and providing incentives for membership.
- Government authorities should also implement measures to enhance the governance and accountability of FBOs as this will help in promoting financial transparency, improving internal control and ensuring democratic representation of members.

REFERENCES

- Abaru, M., Nyakuni, A., & Shone, G. (2006). Strengthening farmer's organizations: RELMA's experience in Eastern and Southern Africa. ICRAF Working Paper no 23.
- Afolami, C.A., Obayelu, A.E., Agbonlahor, M., & Lawal-Adebawale, O.A. (2012). Socioeconomic analysis of rice farmers and effects of group formation on rice production in Ekiti and Ogun States of South-West Nigeria. *The Journal of Agricultural Science*, 4, 233.
- Bachke, M.E. (2009). Are farmers' organizations a good tool to improve small-scale farmers' welfare?
- Bartecchi, D. (2021). Social capital theory and its relevance to sustainable community development. Colorado: Village Earth.
- Bizzi, L. (2015). Social capital in organizations. *International encyclopedia of the social and behavioral sciences* (2nd ed.). Elsevier. 181-185.
- Chilongo, T. (2005). Tanzanian agricultural co-operatives: An overview. A draft report. Moshi University College of Co-operative and Business Studies.
- Esham, M. (2012). Lessons for farmer based organizations (FBO) in Sri Lanka: Experiences from agricultural cooperatives (JA) in Japan. University of Colombo Sri Lanka.
- Fasakin, I.J., & Popoola, O.O. (2019). Agriculture co-operative associations, livelihood income and rural households welfare in Osun State, Nigeria. *Greener Journal of Agricultural Sciences*, 9(2), 180-188.
- Fiorini, P.C., Seles, B.M., Jabbour, C.J., Mariano, E.B., & Jabbour, A.B. (2018). Management theory and big data literature: From a review to a research agenda. *International Journal of Information Management*, 43, 112-129.
- Grigoryan, A., Haknazaryan, T., & Kwapong, N.A. (2008). Farmers organization in the development of agriculture in the South Caucasus: Case of Armenia. Paper Prepared for Presentation at the ICA Research Conference.
- Hastuti, D.R., Darma, R., Salman, D., Santosa, S., & Rahmadanih. (2021). Regression application on the farmers' household consumption expenditure model. *Turkish Journal of Computer and Mathematics Education*, 12 (4), 593-599.
- Hossain, M. J., & Abdullah Al-Amin, A.K M. (2019). Non-farm income and consumption expenditures in rural Bangladesh: Empirical evidence from multilevel regression

- modelling. *Journal of Quantitative Economics*, 17(2), 377-396.
- International Fund for Agricultural Development. (2024). Farmers Organisations.
- Kashim, R.A. (2018). Exploring the strategies for accessing microloans used by small and medium enterprises. Walden Dissertations and Doctoral Studies.
- Kehinde, A. D., & Kehinde, M. A. (2020). The impact of credit access and cooperative membership on food security of rural households in south-western Nigeria. *Journal of Agribusiness Rural Development*, 3(57), 255–268.
- Kehinde, A.D., & Ogundeji, A.A. (2022). The simultaneous impact of access to credit and cooperative services on cocoa productivity in south western Nigeria. *Agric, Food Security*, 11, 1-17.
- Lin, L., Wang, W., Gan, C., Quang, T., & Nguyen. (2019). Credit constraints on farm household welfare in rural China: Evidence from Fujian Province. *Sustainability*, 11, 3221.
- Ma,W., & Abdulai, A. (2016). Does cooperative membership improve household welfare? Evidence from apple farmers in China. *Food Policy*, 58(2), 94-102.
- Manda, J., Azzarri, C., Feleke, S., Kotu, B., Claessens, L., & Bekunda, M. (2021). Welfare impacts of smallholder farmers' participation in multiple output markets: Empirical evidence from Tanzania. *Plos One*, 16(5), 1-20.
- Mbagwu, G.N. (2018). Factors influencing membership of farmers' in cooperative societies in Abia state, Nigeria. *Scientific Papers Series Management, Economic Engineering in Agriculture and Rural Development*, 18(1), 239-244.
- Mignouna, D.B., Abdoulaye, T., Alene, A., Manyong, V.M., Dontsop, P.N., Ainembabazi, J.H., & Asiedu, R. (2015). A microeconometric analysis of household consumption expenditure determinants in Yam growing areas of Nigeria and Ghana. *Tropicultura*, 33(3), 226-237.
- Msuta, P.B., & Urassa, J.K. (2015). The contribution of farmers' organizations to smallholder farmers' well-being: A case study of Kasulu district, Tanzania. *African Journal of Agricultural Research*, 10(23), 2343-2349.
- Muayila, K.H., & Tollens, E. (2012). Assessing the impact of credit constraints on farm household economic welfare in The Hinterland of Kinshasa, Democratic Republic of Congo. *African Journal of Food, Agriculture, Nutrition and Development*, 12(51), 6095-6109.
- Muroiwa, J., Mushunje, A., & Musitini, T. (2018). Factors influencing farmer participation in tobacco contract farming arrangements in Mount Darwin district of Zimbabwe. *International Journal of Development and Sustainability*, 7(12), 2986-3001.
- Musa, H., & Mesfin, H. (2017). The impact of agricultural cooperatives membership on the wellbeing of smallholder farmers: empirical evidence from eastern Ethiopia. *Agricultural and Food Economics*, 5(6), 1-20.
- National Bureau of Statistics. (2019). Demographic Statistics Bulletin.
- Okezie, C. R., Teran, A.D., & Enete, A. A. (2021). Effect of informal credits on farm household's welfare in south east, Nigeria: A quantile regression approach. *Nigerian Agricultural Journal*, 52(3), 293.
- Okunmadewa, F., Olaniyan,O., Yusuf, S.A., Bankole, A.S., Oyeranti, O.A., Omonona, B.T., ... Olayiwola, K. (2010). Poverty and inequality among rural households in Nigeria. *New York Science Journal*, 5(10), 13-19.
- Omonona, B.T. (2001). Poverty and its correlates among rural farming households in Kogi State, Nigeria. Unpublished PhD Thesis. University of Ibadan, Nigeria.

- Rahmadanih, S., Bulkis, M., Arsyad, A., Amrullah, N., & Viantika, M. (2018). *Role of farmer group institutions in increasing farm production and household food security*. IOP Conf. Series: Earth and Environmental Science.
- Rui, L., & Xi, Z. (2010). Econometric analysis of credit constraints of Chinese rural households and welfare loss. *Applied Economics*, 42(13), 1615-1625.
- Rwela, A.G. (2023). Socio-economic and institutional determinants of membership in agricultural marketing co-operative societies in Mvomero and Kilombero districts, Tanzania. *Development Studies Research*, 10(1), 1-15.
- Tran, M., Gan, C., & Baiding, H. (2016). Credit constraints and their impact on farm household welfare: Evidence from Vietnam's North Central Coast region. *International Journal of Social Economics*, 43(8), 782-803.
- Wennink, B., Nederlof, S., & Heemskerk, W. (2007). *Access of the Poor to Agricultural Services: The role of farmers' organizations in social inclusion*. KIT Publishers: Amsterdam.