



COMPARATIVE ANALYSIS OF PROFITABILITY OF PARTICIPATING AND NON-PARTICIPATING RAINFED RICE FARMERS IN THE ANCHOR BORROWERS' PROGRAMME IN SELECTED LGAS OF KADUNA STATE, NIGERIA

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ABSTRACT

Rice remains a critical staple food in Nigeria, supporting both national food security and rural livelihoods. Despite its importance, productivity among smallholder rice farmers remains low, primarily due to limited access to improved inputs, credit, and extension services. To address these challenges, the Anchor Borrowers' Programme (ABP) was introduced in Kaduna State in 2017. This study assessed the profitability of rainfed rice farmers who participated in the ABP compared to non-participants. A total of 263 farmers (143 participants and 120 non-participants) were selected using a multistage sampling technique across four Local Government Areas in Kaduna State. Primary data were collected using structured questionnaires and analyzed using descriptive statistics, gross margin analysis, and t-tests. Findings revealed significant differences in age, household size, farming experience, education level, and cooperative membership between the two groups. ABP participants recorded higher mean yields (3174.1 kg/ha), lower production costs (₦210,400/ha), and significantly greater gross margins (₦1,440,132) compared to non-participants. Return on investment was also higher for participants (6.84) than for non-participants (3.27), indicating enhanced profitability due to ABP support. Key constraints identified include inadequate access to capital, poor credit facilities, weak extension service delivery, and infrastructural challenges such as transportation and storage facilities. The study concludes that participation in the ABP has a positive impact on productivity and profitability. It recommends scaling up the program to include more farmers, improving access to credit, strengthening cooperatives, and enhancing extension services to sustain growth in rice production.

Keywords: Anchor Borrowers' Programme, Production, Profitability, Rice, Rainfed Rice, Smallholder Farmers

INTRODUCTION

Rice stands as a pivotal staple crop for a significant portion of the global population, being the second most extensively cultivated grain after maize (Food and Agriculture Organization Statistics/FAOSTAT, 2021). Its paramount importance in human nutrition and calorie intake is evident due to its dominance in dietary preferences and nutritional significance (Kaka, Gindi, & Khalid, 2020). In Nigeria, the cultivation of rice is predominantly undertaken by smallholder farmers who adhere to traditional methods that have been associated with challenges of diminished productivity (Tsado, Ojo and Ajayi, 2014).

Rice serves as a staple crop cultivated and consumed across the Nigeria, occupying over 1.7 million hectares of the available 4.6 million hectares for cultivation (Food and Agriculture Organization/FAO, 2022). Despite this widespread cultivation, the sector remains largely dominated by small-scale farmers who often do not assess their production efficiency (Kaka et al., 2020). Although ranking sixth after sorghum, millet, cowpea, cassava, and yam (NAERLS, 2020), rice production witnessed substantial growth from 2.4 million metric tons in 2019 to 5.8 million metric tons in 2020 (NAERLS, 2020). Yet, the escalation in domestic production hasn't bridged the demand-supply gap, leading to considerable imports and foreign exchange expenditures (Federal Ministry of Agriculture and Rural Development/FMARD, 2020).

Numerous agricultural programs and policies have been enacted to mitigate this gap, such as the Anchor Borrowers Programme (ABP) initiated by the Central Bank of Nigeria (CBN) to foster local production of rice and wheat (Bitrus *et al.*, 2021). The ABP, commenced in 2015, aims to bolster integrated millers, enhance financing, build farmers' capacity, and exploit Nigeria's comparative advantages in agriculture (Bitrus *et al.*, 2021). Kaduna State in particular, which contributes about 4 % of Nigeria's total rice output, the ABP was introduced in 2017 to address low productivity and improve farmers' livelihoods. Despite its potential for rice production, the State faces subpar productivity, with an average yield of 3240 kg/ha in 2020 (NAERLS, 2020). The ABP is designed to provide labor and input support to participating farmers, addressing the demand-supply gap and enhancing production efficiency (CBN, 2019).

While various studies have delved into rice production dynamics both in Nigeria and globally (Kaka *et al.*, 2020; Bitrus *et al.*, 2021; Subedi *et al.*, 2020), a research gap persists in the analysis of profitability among participants and non-participants of the Anchor Borrower's Program, specifically within rainfed rice farming in Kaduna State, Nigeria. This research void necessitates addressing the lacuna to provide valuable insights into improving productivity among existing rice farmers. This study therefore examines the profitability of rice productions of participating and non-participating rainfed rice farmers in the Anchor Borrower's Program in Kaduna State, Nigeria.

MATERIALS AND METHODS

Study Area

The study was carried out in Kaduna State. The Kaduna state is located in the Northern Guinea Savannah ecological zone, located between latitude 9° N and 12° N and longitude 6° E and 9° E of the prime meridian. The population of the state was projected to be 9,805,858 people in 2021 at population growth rate of 3.2% occupying an area of approximately 68,000 square kilometers. Agriculture is the main stay of the economy of Kaduna State with about 80 % of the people actively engaged in farming (John & Balogun, 2025).

Sampling Technique and Sample Size

A two-stage sampling procedure was adopted for the study. The first stage involved purposive selection of Makarfi and Sabon Gari Local Government Areas, based on the fact that they are among the LGAs participating in ABP programme and are also among areas with high concentration of rice farming activities within the State (KNARDA, 2019). The second stage involved a random selection of three communities from each LGA. This gave a total of six (6)

communities which were Meyere, Gubuchi, Gimi, Bormo, Saka-Dadi and Basawa. To control for spillover effect, two LGAs (Kudan and Ikara) were purposively selected from the non-participating LGAs and three communities (Zabi, Hunkuyi, Doka, Furana, Auchan, Rumi) were also randomly selected from each of the two LGAs making a total of 6 communities.

Finally, Slovia Formula was used to determine the sample size from each of the communities based on the assumption of 5 % expected margin error, which is 95 % confidence level. It was given as;

$$n_0 = \frac{N}{1+(Ne^2)} \tag{1}$$

Where: n_0 is the required sample size; N is the sample frame and e = the expected error.

These gave a total number of 143 participants and 120 non-participants are also selected from the four LGAs. The non-participants were selected to serve as control group. In all, a total of 263 rural farmers were selected as the sample size as shown below.

Table 1: Sampling Technique and Sample Size

PLGA	SV	SF	SS (33 %)	NPLGA	SV	SF	SS (33 %)
Makarfi	Meyere	31	20	Kudan	Zabi	32	20
	Gubuchi	34	22		Hunkuyi	42	27
	Gimi	40	26		Doka	33	21
Sabon Gari	Bomo	78	27	Ikara	Furana	69	35
	Saka-Dadi	40	26		Auchan	49	31
	Basawa	35	26		Rumi	34	22
Total		423	143			341	120

Note: PLGA=participants local government area and NPLGA=nonparticipants local government area, SV= selected villages, SF= sample Frame and SS=Sample Size
Reconnaissance Survey, 2019

Method of Data Collection

Primary data was used for the study. A cross-sectional data for cropping season of 2019 (which covered July through to October) was collected from the selected farmers by administering a well-structured questionnaire in the area through the help of well-trained enumerators. The information collected from the farmers include: age, sex, number of years in rice farming, educational level, household size, farm size, number of extensions contact, membership of associations, land renting, amount of credit received and interest charged, inputs availability and prices, source and quantity of labour, output and its price(s) and finally constraints faced in rice production were also obtained from the farmers.

Analytical Techniques

The analytical techniques that were used for this research to achieve its objectives include: Descriptive Statistics, which was used to describe the characteristics of socio-economic characteristics and the constraints facing the rice production in the study area, and Gross margin model was used to estimate the cost and return of rice production in the study area.

Model Specification

The gross margin model is expressed as;

$$GM = TR - TVC \tag{2}$$

Where: GM = gross margin (Naira), TR = total revenue, TR = (Q x P) , Q = quantity of rice produced
P = price of rice, TVC = Total variable cost and it constitute the cost of raw material and the cost of farm operations.

Therefore, the study also used return on investment model (ROI) to further assess the profitability optimality of the enterprise. It estimates how much money the enterprise earns in return for every one Naira invested (UNDP, 2018). The return on investment was computed using the formula;

$$ROI = \frac{TR}{TVC} \times 100 \tag{3}$$

Where: ROI= Return on Investment, TR= Total revenue

RESULTS AND DISCUSSION

Descriptive Statistics

Distribution of Rice Farmers According to Age, Household Size, Farming Experience, and Farm Size

The independent t-test was used to test for difference in socio-economic characteristics between participants and non-participants

The result of the analysis in Table 2 revealed that the mean age of the sampled rice farmers was 42 years with the non-participants having a mean age of 53 years and the participants having a mean age of 45 years respectively. The difference in the means was significant at 1 % level of significant, indicating that the non-participants of the ABP were significantly older than the participants. Both the participants and non- participants had majority of their farmers in the age class of 40-50 years with 72.50 % and 51.67 % respectively. This explains that majority of the sampled farmers were in their productive ages which constitutes a dynamic and suitable work force for agricultural production. This finding is in line with the findings of Ahmed *et al.* (2020) who testified that, the active and productive age of farmers is between 41 and 50 years and as such, farmers in this age range

can withstand stress which may have an implication on farmers productivity as well as the spread of innovation. It was also revealed that, the mean household size of the sample farmers was 8 persons. The participants of the ABP had the average of 7 persons per household while the non-participants had the average of 11 persons. The t-value was significant at 5 % showing that the non-participants had a larger household size than the participants. By implication, the homogeneity level of both groups of farmers with regards to household size is also high and farmers in the state mostly have a household size ranging between 1-12 members. The study agrees with the findings of Kaka *et al.* (2021) which revealed that 69.17 % of rice farmers have a household size ranging between 6-10 members.

On farming experience, it was revealed that, the mean farming experience for the sampled rice farmers is 22 years. Comparatively, the mean farming experience for participant group of ABP farmers is 17 years and 28 years for the non-participants group. About 41.3 % of the participant had an experience between 1–10 years while, about 48 % of the non-participant are between 11–20 years of experience in rice production. The implication of this finding is that experienced farmers are more likely to make sound decision that will

increase his output, income and savings, *ceteris paribus*. The variations in number of years of rice farmers between the two groups differed significantly at 1 % level. This is supported by the finding of Ahmed *et al.* (2021) and Biswas *et al.* (2020) who argued that as farmers gain more experience, they are able to evaluate the benefits of new technologies and therefore, increase the rate of adoption

Finally, Table 2 revealed that, the mean land holding for the sampled farmers is 1.37 ha per household. This shows that most of the farmers were smallholder farmers which concur with the country's estimation of 87 % of the farmers in the country owning 2.5 ha or less (NEARLS, 2020). To this end, the participants group had a smaller size of land with a mean of 1.28 ha while the non-participants group had a mean land size of 1.19 ha. But the difference in land holding between the participants and non-participants was not significantly different. This shows that differences in farms cultivated by participant and non-participant farmers were negligible thus uniform in size. This finding is in line with the finding of Ahmed *et al.* (2020) who in their study found that the average farm size of 1.94 ha across the States studied.

Table 2: Summary Statistics of the Continuous Variables in the Model (Age, Household Size, Framing Experience, and Farm Size)

Variable	Participant	Non- Participant	Pooled	^Difference Test
	F(%)	F(%)	F(%)	
Age (years)				
Minimum	19	21	19	10.664***
Maximum	69	75	75	
Mean	45	53	42	
Household size (absolute number)				
Minimum	2	5	2	2.295**
Maximum	10	12	12	
Mean	7	11	8	
Farming experience (years)				
Minimum	5	7	5	4.059**
Maximum	20	40	40	
Mean	17	28	22	
Farm size (ha)				
Minimum	0.25	0.5	0.25	0.474
Maximum	7.5	9.5	9.5	
Mean	1.28	1.19	1.37	

*** p<0.01, ** p<0.05

Distribution of Rice Farmers According to Gender, Marital Status, Educational Level, Access to Extension Services and Membership of Cooperatives

The Ch²-test was used to test for difference in socio-economic characteristics between participants and non-participants

The result on the gender analysis of the sampled farmers in the study area revealed that male farmers constitute the majority (94 %) while only few (6 %) were females which implies that there are more male farmers than female farmers engaged in rice production among the sampled farmers in the study area possibly because male could exert more physical labour that is required for such enterprise. Likewise, from the result in Table 3, majority (95.10 %) of the participant group were male and 4.89 % were females while, the non-participant group has about 93 % male and about 7 % females. This implies that rice production in the study area is skewed towards male folk. In other words, rice production in the study area is stereotyped to sex. Further, sex differences between

participants and non-participant farmers were not statistically significant. The result of this study agrees with the findings of Bitrus *et al.* (2021) in their study on econometric analysis of rice production among beneficiaries of anchor borrowers' programme in Gerie local government area of Adamawa state, Nigeria.

A result of the analysis on marital status in Table 3 revealed that the majority 77.85 % of the sampled farmers are married. Based on the result of the analysis, the result revealed that about 82 % of the participants group and about 73 % of the non-participants group were married. Furthermore, marital status differences between participants and non-participant group were statistically significant at 1 %. It implies that majority of the farmers are married and it agrees to the findings of Kaka *et al.* (2020) that reported over 83 % and 90 % of rice farmers are married.

The results in Table 3, revealed that majority (56.27 %) of the sampled farmers do not have any form of formal education.

Comparatively, about 59 % of the participants and 52 % of the non-participants do not have any form of formal education. This implies that there are more non-educated participants than non-participants in the study area. This is an indication that literacy level among the groups was very low and this can hinder full adoption of agricultural innovations by farmers. Differences in years spent in school differed statistically at 1 % level implying that participants group were significantly more educated thus had enhanced skills and ability to better utilize market information and understand modern technologies. This finding contradicts the findings of Ahmed *et al.* (2020) who noted in their study that the majority 87.1 % in intervention districts and 89.5% from non-intervention districts had low education level. Concerning availability of extension services only 39.92 % of the farmers had at least one interaction with extension agents, while majority (60.07 %) of the respondents had no access to extension services (Table 3). The study revealed that majority participants group (60.84 %) had access to extension services while about 85 % of the non-participants reported they had no access to extension services. In many rural settings, access to adequate knowledge, improved technology, financial services and other relevant social services (e.g. drinking water, education and health services) remain a critical issue. This implied that the bulk of the smallholder farmers were not well informed on the new and emerging technologies. The

relationship between extension access and farmers was not statistically significant. This finding is in line with the finding of Ahmed *et al.* (2021) who in their study found that about 50 % of the rice farmers in Anambra State do not have access to extension services.

Cooperative associations provide avenue for social participation that help farmers to pool their resources together, to have access to production inputs including credit finance and to have interaction with other as well as sharing information on modern production practices thereby enhancing diffusion of any possible innovations and improvement in their production. About 68 % of the sampled farmers belong to one cooperative association or the other with varying years of membership ranging from 1 to 20 years (Table 3). The results also shows that about 87 % of the participants are members of associations especially those related to rice production while about 56 % of the non-participants are not members of any cooperative association. This is an indication that the majority of the sampled farmers belong to a cooperative in the study area. Furthermore, membership of cooperative society between participants and non-participant farmers differed statistically significant at 5 %. This finding is in line with the finding of Obianefo *et al.* (2021) who in their study found that the average about 80 % of the rice farmer in Anambra State belong to cooperatives.

Table 3: Summary Statistics of Categorical Variables in the Model (Gender, Marital Status, Educational Level, Access to Extension Services and Membership of Cooperatives)

Variable	Participant F (%)	Non- Participant F (%)	Pooled F (%)	^Difference Test
Gender				
Male	136(95.10)	112(93.33)	248(94.29)	0.785
Female	7(4.89)	8(6.67)	15(5.70)	
Total	143(100)	120(100)	263(100)	
Marital Status				
Single	18(12.58)	21(17.50)	39(14.83)	2.669***
Married	118(82.52)	87(72.50)	205(77.85)	
Devoiced	5(3.49)	8(6.67)	13(4.94)	
Widow	2(1.39)	4(3.33)	6(2.28)	
Total	143(100)	120(100)	263(100)	
Education level				
No formal education	85(59.44)	63(52.50)	148(56.27)	5.365***
Primary	35(24.48)	24(20.00)	59(22.43)	
Secondary	18(12.59)	25(20.83)	43(16.35)	
Tertiary	5(3.49)	8(6.67)	13(4.94)	
Total	143(100)	120(100)	263(100)	
Access to extension				
No Access	138(96.50)	102(85.00)	240(91.25)	0.533
Had Access	5(3.49)	18(15.00)	23(8.75)	
Total	143(100)	120(100)	263(100)	
Membership of cooperation				
Member	125(87.41)	53(44.17)	178(67.69)	2.011**
Non member	18(12.59)	67(55.83)	85(32.31)	
Total	143(100)	120(100)	263(100)	

*** p<0.01, ** p<0.05

Profitability of Rice Production

The result in Table 4 above revealed that, on the average, it costs ₦ 210,400 to cultivate one hectare of rice farmland for participant and ₦ 238,600 for non-participants in the study area. An average of ₦ 1,440,132 accrues to a participant farmer as revenue while ₦ 781,535 for non-participant group. A mean gross margin of the participants group is ₦ 1,440,132

per hectare which is more than that of the non- participants group (₦ 781,535 per hectare). In addition, the returns on every Naira invested for the participants group is ₦ 6.84 and a gross profit margin of 87.25 % while, the non- participants group had ROI of ₦ 3.27 and a gross profit margin of 76.61 %. To this end, the study revealed that for every ₦ 1 invested in rice production in the study area, a farmer gets ₦ 6.84 K

and ₦3.27 K as profit for the participant and non-participants respectively. These levels of profit translate to about ₦120,011 for participants and ₦65,127 for non-participants per month as income. The findings of this study agree with the results of Kaka et al. (2020), Subedi et al. (2020) and Btrus et al. (2021) they all reported rice production as a profitable venture, and also reported that cost of seeds, labour and fertilizers are those variable items where more money is expended in rice production and hence are the most demanding variable items for rice production.

Furthermore, the result of the analysis shows that the participants group of ABP farmers had about 15.63 % (₦32,900) of its total cost spent on labour, 61.79 % (₦130,000) on fertilizer purchase, 9.51 % (₦20,000) on hiring farm land per hectare, 8.56 % (₦18,000) spent on seed procurement, 2.14 % (₦4,500) on herbicide, 0.85 % (₦2,000) as transportation costs and 1.43 % (₦3,000) spent on purchase of bags for storage. While from the non-participants group of ABP farmers spent 16.42 % (₦39,150) of their total cost on labour, 60.35 % (₦144,000) for fertilizer purchase, 11.74 % (₦28,000) spent on seed, 8.38 % (₦20,000) on hiring farm land, 1.38 % (₦3,300) on herbicide, 0.75 % (₦1,800) as transport cost and 0.99 % (₦2,350) spent on costs of acquiring bags. Based on the result of the analysis, it is plausible to conclude that among the components of the total variable costs, expenditure on fertilizer formed the largest cost item of the total variable costs of both the participants and non-participants.

Test of hypothesis

Accordingly, an independent-samples t-test was run to determine whether there was a significant difference in the cost of production between the participants and non-participants (Table 4). The test revealed a statistically significant difference between the participants and non-participants. The non-participants reported significantly higher total variable cost per-hectare than did the participants. The glaring difference in the cost of rice production is due to the high labour expenditure by the non-participants. The result of the independent sample t-test further revealed that there was a statistically significant difference in yield between the participants and non-participants. High mean differences in the productivity between the participants and non-participants could be due to the quality of seeds and the responsiveness of the improved seeds to soil nutrients and/or fertilizer supplementation, which was more common the participants group as a result of been in the programme. Moreover, the results further indicated a statistically significant difference in the gross return between the participants and non-participants. The participants reported significantly higher gross returns from paddy than the non-participants. The significant difference in the gross return could be due to the higher productivity of the improved rice variety and its complementary inputs received during the programme. The implication of this finding is that in spite of the differences among the groups, the profit is positive and therefore, there is incentive to continue rice production across the studied area and even beyond as long as rice availability remains a problem in the State in particular and the country at large.

Table 4: Cost and Return Estimate of Rice Production Per Hectare by the Sampled Rice Farmer

Description of variable input	QTY	P			NP			t-test
		Price(₦)	Value(₦)	%	QTY	Price(₦)	Value(₦)	
a) Expenses on material farm input								
Cost of seed (kg)	60	450	18,000	8.56	70	400	28,000	11.74
Cost of fertilizer (kg)	200	650	130,000	61.79	200	720	144,000	60.35
Cost of herbicide (liters)	3	1500	4,500	2.14	2	1650	3,300	1.38
Cost of hiring land (₦/ha)	1	20,000	20,000	9.51	1	20000	20,000	8.38
Cost of Transportation (₦/100 kg bag)	-	2,000	2,000	0.95	-	1800	1,800	0.75
Cost of bags for Storage (₦/ bag)	-	3,000	3,000	1.43	-	2350	2,350	0.99
Sub-total			177,500				199,450	
b) Expenses of farm labor (Man-days)								
Land preparation (₦/ha)	14	700	9,800	4.66	15	650	9,750	4.09
Planting (₦/ha)	7	500	3,500	1.66	8	600	4,800	2.01
Thinning/transplanting (₦/ha)	8	600	4,800	2.28	7	600	4,200	1.76
Fertilizing (₦/ha)	6	600	3,600	1.711	9	650	5,850	2.45
Weeding (₦/ha)	7	600	4,200	1.99	9	700	6,300	2.64
Harvesting (₦/ha)	10	700	7,000	3.33	11	750	8,250	3.46
Sub-total			32,900	15.63			39,150	16.42
Total variable Cost (a + b)			210,400				238,600	2.678**
Total revenue (TR)	3174.1 Kg	₦ 520	1,650,532		2170.5 Kg	₦ 470	1,020,135	18.732***
Gross margin (GM)			1,440,132				781,535	79.543***

Description of variable input	P			NP			t-test
	QTY	Price(₦)	Value(₦)	QTY	Price(₦)	Value(₦)	
Gross Profit Margin (GM/TR*100)			87.25			76.61	
Returns on Naira Invested (GM/TVC)			6.84			3.27	

Note: P=participant, NP= non participant and Qty = Quantity

*** p < 0.01, ** p < 0.05

Constraints Encountered by The Sampled Rice Farmers

The results from Table 5 above show various constraints associated with rice production ranked in order of severity using the mean score in the study area. The result shows that inadequate capital availability and insufficient credit source to support farm work were ranked 1st and 2nd among the constraints with a mean score of (MS=2.12) and (MS=2.43) respectively. This implied that, resource poor farmers could not purchase quality production inputs, pay for labor and efficient postharvest operations. Similar discoveries were made during the FGDs where the sampled farmers identified availability of capital, credit facilities, and transportation cost as most important constraints to rice production in general. This ranking showed that finance could hinder production of rice production as a result of inability to purchase farming inputs.

Furthermore, weak agricultural extension service delivery was ranked 3rd (MS=2.64). The result is conforming to the 75.6 % of farmers without extension visit as shown in the analysis of the socio-economic variables. Problem of farm implements and equipment is the 4rd constraint with a mean score of (MS=3.00) among the groups. The high cost of labour may be attributed to the fact that rice production in the study area is labour-intensive and shortage of labour in relation to the demand as a result of competition for available labour raises the cost of labour. The 5th constraint is problems of drying, processing and storage, facilities with a mean score of (MS=3.16).

The sampled rice farmers reported that, their inability to maintain produced quality is due to inadequate of improved storage and drying facilities. This was followed by high cost of transportation as the 6th constraints (MS=4.32). High cost of transportation could lead to high marketing challenges resulting from damages in the process of conveying the produce. This often times leads to crop losses in addition to increase in total cost due to exorbitant transportation cost.

The last three constraints which are lack of collateral security required to secure loan, land acquisition and land tenure problems and cultural beliefs were ranked 7th, 8th, and 9th with a mean score of (MS=5.02), (MS=7.21) and (MS=8.37) respectively (Table 4).

The study further test to determine the agreement among farmers using the Kendall's coefficient of concordance as presented in Table 5. The result shows that about a quarter (26.2 %) of the farmers agree with each other on their rankings. This means that 26.2 % of the sampled rice farmers interviewed in the study area agreed with the ranks assigned to the various constraints they face at 1 % significant level. The asymptotic significance was found to be 0.000 which is less than p < 0.01. Furthermore, the level of agreement is highest among the non-participants group (37.8 %) and lowest for participants (23.7 %) hence farmers in the latter group are more heterogeneous in their rankings.

Table 5: Constraints Encountered by the Sampled Rice Farmers

Constraints Encountered	Participants		Non- Participants		Pooled	
	Mean	Rank	Mean	Rank	Mean	Rank
Inadequate capital availability	1.12	1	2.13	2	2.12	1
Insufficient credit source to support farm work	2.02	2	2.09	1	2.43	2
Weak agricultural extension service delivery	3.11	3	3.46	7	2.64	3
Problems of farm implement and equipment	4.23	5	3.27	6	3.00	4
Problems of storage and drying facilities	4.14	4	2.68	5	3.18	5
High transportation cost	5.87	7	4.48	6	4.32	6
Lack of collateral security required to secure loan	4.66	6	2.62	4	5.02	7
Land acquisition and land tenure problems	9.34	9	7.00	9	7.21	8
Cultural beliefs	6.28	8	6.32	8	8.37	9
Test Statistics						
Kendall's Coefficient of Concordance	0.237		0.378		0.262	
Chi-Square	238.635***		237.736***		328.376***	
Degree of freedom	10		10		10	
Asymptotic Sig.	<0.001		<0.001		<0.001	

*** p<0.01

CONCLUSION

The study concludes that rice farmers in the study area have long been engaged in production, with significant improvements in productivity and income among participants, confirming the positive impact of the Anchor Borrowers' Programme (ABP). However, despite gains in profitability and input access, challenges such as limited

credit, weak extension services, and poor infrastructure continue to constrain optimal productivity.

Based on these findings, it is recommended to expand awareness and enrolment especially among experienced farmers while providing flexible, collateral-free credit through cooperatives and community-based schemes. Additionally, stakeholders should strengthen extension

services through increased recruitment, digital and peer-learning approaches, and support the development of functional farmer cooperatives to improve access to inputs, knowledge, and finance.

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