



FACTORS INFLUENCING ADOPTION OF IMPROVED RICE PRODUCTION TECHNOLOGIES IN WESTERN AGRICULTURAL ZONE OF BAUCHI STATE, NIGERIA

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ABSTRACT

The study examined the factors influencing adoption of improved rice production technologies by rice farmers in western Agricultural zone of Bauchi State, Nigeria. Multistage sampling technique was employed to select 185 rice farmers from the study area. Primary data were obtained through the administration of structured questionnaires analyzed using both descriptive and inferential statistics to achieved objectives of the study. The result of the study revealed that the majority of rice farmers were males with average age and household size of 43 years and 9 persons per household respectively. Majority (41.1%) had tertiary education, and farming was their primary occupation. They had an average of 10.3 years of farming experience and 55.7% were members of a rice farmer's cooperative society. However, only 32.4% had access to credit. Most (91.4%) had a farm size of 1-5 hectares and 51.4% used hired labour. Friends and relatives were the main source of information for 40% of farmers, while media was the main source for 36.6%. The result also found that household size, age, farmers' cooperatives, and sex were all positive and significant factors influencing the adoption of improved rice production technologies at ($P < 0.05$) and ($P < 0.01$) respectively. Land size and rice income were both negative and significant ($P < 0.05$) and ($P < 0.10$) respectively in influencing the adoption of improved rice production technologies. The major constraints faced by respondents in adopting rice production technologies were high cost of farm inputs (3.79), scarcity of recommended rice varieties (3.19), low level of awareness (3.28), inadequate extension agents' access (3.39), low accessibility of credit (3.42), climatic change (3.14), and high cost of input (3.59). The study concluded that, household size, age, membership of cooperative societies and sex were the factors influencing the adoption of improved rice production technologies among the respondents. It is therefore recommended, Government and NGOs should intervene and provide frequent extension contacts/visits by employing more extension agents to reduce the gap between research and farmers, government should also provide soft loans to farmers at single digit interest to enable them expand their production base and finally, a climate smart technology should be developed by research institutions to help farmers mitigate the impact of climate change.

Keywords: Factors, Adoption, Recommended, Varieties

INTRODUCTION

Agriculture is a livelihood as well as an economic enterprise employing about 60 percent of the world's population and is intimately linked with food security, health, and nutrition through direct consumption and market linkages (Poole, 2017). Smallholder agriculture is one of the principal economic occupations in the world and is the main source of



income and employment for 70 percent of the world's poor who live in rural areas and account for 60 percent of global agriculture (Poole, 2017). Estimates show that there are about 500 million farms globally which are being cultivated by smallholder farm households with more than 2 billion people making their livelihood from these farms (Abdullah, *et al* 2017). In Africa, agriculture remains a strategic sector and its wealth directly affects economic development, food security, poverty alleviation and social welfare, particularly of countries in Sub-Saharan Africa whose agriculture is dominated by smallholder farmers (Mango, *et al* 2017). Meanwhile, agriculture is the second largest economic sector in Nigeria after petroleum. It contributes more than 40% to gross domestic product (GDP) and remain the most important sector in transforming rural communities (USDA, 2015).

Rice (*Oryza sativa L.*) is one of the most necessary agricultural food for more than half of the world's population (Abdulmumini *et al.*, 2021). Amos (2014) states that the total area under rice cultivation is globally estimated to be 150 million ha, with annual production averaging 500 million metric tons (MT). Its production accounts for 29% of the total output of crops worldwide, with Africa accounting for about 10 to 13%, Evans *et al.* (2018). Rice is the fifth most essential cereal in relations to land and fourth in production in sub-Sahara Africa (SSA). Its production is mostly by smallholders' farmers, with an average farm size of 1 to 2 ha. Rice is consumed through all income groups and 2019 rice consumption is projected to increase by 4 % to 6.7 million tons from the 6.4 million tons recorded in 2018 (Global Agricultural Information Network [GAIN], 2018). The Nigeria's increasing rice consumption is mostly driven by population growth, increasing urbanization as well as a substitution of the traditional coarse grains. Production has still not kept pace with intake. Nigeria eats more rice than it produces and imports are increases over the years. Given that rice is one of the important food crops in the world and ranks second in terms of area and production reveals the contribution of smallholder farms to global food supply (Arias *et al.*, 2013). Rice production plays a principal role in providing food security for poor households in both rural and urban locations in Africa (Ragasa and Chapoto, 2017), given that nearly 20 million farmers in Sub-Saharan Africa grow rice and about 100 million people depend on it for their livelihoods (Nwanze, *et al.*, 2016). Over the years, rice has become an ideal substitute for most traditional coarse grains and root and tuber crops in Sub-Saharan Africa due to the changing food preferences in both urban and rural areas (Asante, *et al.*, 2014).

In smallholder agriculture, having access to better seeds is essential to promoting technology adoption and raising agricultural output. Weak seed supply networks hinder access to better seed varieties in many sub-Saharan African (SSA) nations; these networks have been recognized as barriers to the broad adoption of improved seed varieties (Salihu *et al.*, 2022). Over the long term, large investments and sustained political commitment are needed to ensure strong plant breeding and seed systems to serve smallholders, predicated on improved crop management practices to protect soils and cope with unreliable rainfall, and access to appropriate labour-saving technologies (Smale *et al.*, 2013). In view of that, more innovative extension and advisory systems are also needed to facilitate farmer learning and adapt techniques and technologies to local environmental and social conditions. Nevertheless, better financial services, perhaps including new forms of insurance, are needed for smallholders.

Farmers' use of technology is a crucial prerequisite for emerging nations' economies to grow. A significant portion of resources have been allocated to extension services in many developing countries with the aim of educating farmers about modern agricultural techniques. According to Chekene and Chancellor (2015), such programs have been implemented in Nigeria under the Agricultural Development Project (ADP) and Sasakawa Global 2000 (SG



2000). The variables influencing the adoption of technology affect how effective these programs are. Thus, in order to effectively target and implement programmes, extension educators and technical assistants must have an understanding of the factors influencing technology adoption.

Consumption of rice in West Africa increased from the fourth most consumed cereal to the first within fourteen years (1990 to 2014), (USDA, 2015). Continual population growth coupled with rapid urbanization is further stimulating demand. Furthermore, there has not been any empirical study into the factors influencing adoption of improved rice farming technologies implied in the study Area. This study was, therefore undertaken to fill this gap in scientific knowledge in the study area. This study was therefore carried out to assess the adoption of improved rice farming technologies by rice farmers in Western Agricultural Zone of Bauchi state, Nigeria. The specific objectives are to: describe the socio-economic characteristics of the rice farmers in the study area, identify improve rice production technologies available in the study area, determine the factors influencing the adoption of improved rice production and identify constraints to the adoption of improve improved rice production technologies in the study area.

METHODOLOGY

The Study Area

This study was conducted in Western Agricultural Zone of Bauchi State in the north-east geo-political zone of Nigeria. The state is located between latitudes 9°30' and 12°30' North of the equator, and between longitudes 8°45' and 11°0' East of the Greenwich meridian. Bauchi State covers about 49,259 Km² with a population of 6,537,314 people according to National Bureau of Statistics 2022 projection (2017). The western zone comprises of seven LGAs which include Alkaleri, Kirfi, Bogoro, Dass, Toro, Bauchi and Tafawa-Balewa LGAs. Dass Local Government Areas. is located at latitudes 9°30 North and longitudes 8°45 East and it has a population of 200,987. The climate is characterized by two distinct seasons, dry and wet seasons. It has temperature of 15 to 30°C. The area recorded an average rainfall of 1000 mm annually. The people of Dass local government area engages in farming activities for a livelihood because of the fertile land. Different varieties of crops are produced in the area including rice, millet, sorghum, cowpea, groundnut and soybeans. Furthermore, livestock such as cattle, sheep, and goats are produced in the area (Bose *et al*, 2020).

Toro is located at Latitudes 5°40' and 7°40'N and longitudes 5°00' and 6°30'E. It has an area of 6,932km², with a population of 617,800 (NPC projection, 2022). While Tafawa Balewa LGA is located to the southern part of Bauchi town, about 80km along Bauchi-Kwabir road. It lies between latitude 9°41'E and longitude 10°5'N. It has land area of 2,515km² and population of 395,200 (Dau and Elisha, 2013). The predominant tribes are 'Jarawa, Sayawa, Gerawa, Fulani and Hausa'. Human activities include farming, hurting, business, civil service, crafting, etc., (Nigerian National Bureau of Statistics, 2010). Bauchi is an agricultural State, animal rearing and production are important in the state, particularly cattle, goats, sheep, donkeys and pigs. Poultry production is also significant (Lawal *et al.*, 2015).

Sampling Procedure and Sample Size

A multi stage sampling technique was used for this study. In the first stage, a purposive sampling was used in selecting Toro, Dass and Tafawa Balewa LGAs in Western Zone. In the second stage also, purposive sampling was used in selecting three villages from each of the three LGAs selected making a total of nine villages. This was done based on the intensity of rice farming in the area. A sampling frame of 1,230 rice farmers was obtained from Rice



Farmers Association of Nigeria (RIFAN) Bauchi State Chapter. Finally, 15% of the farmers were randomly selected from the sampling frame, making a total sample size of 185 rice farmers in the study area as presented in the Table 1.

Table 1: Sampling Procedure and Sample Size

Local Gov't Areas	Villages	Sampling Frame	Sample Size (15%)
Toro	Kogin Salla	132	20
	Sabon Garin Tulu	116	17
	Yataji	122	18
Dass	Wandi	129	19
	Kagama	211	32
	Dot	131	20
Tafawa Balewa	Burga	171	26
	Zwall	110	17
	TafawaBalewa	108	16
Total	9	1,230	185

Source: RIFAN, 2021

Methods of Data Collection

Data for the study was obtained from primary sources. The primary data was collected using structured questionnaires that were administered to the farmers. The data was collected on socio-economic variables such as educational level, annual farm income, age, farming experience, gender, farm size and household size. Data was also collected on information of improve rice production technologies, the level of adoption of improved production technologies, factors influencing the adoption of improved rice production, the factors that affect adoption of improved rice production and constraints to the adoption of improve improved rice production technologies in the study area.

Methods of Data Analysis

Both descriptive and inferential statistics were used for this study.

Descriptive Statistics

The descriptive statistics used include percentage, bar chart, pie chart means, standard deviation, and rank order. These techniques will be used to achieve objectives one, two and five.

Logit Regression Analysis

Regression model was used to achieve objective three. The regression model is specified as follows;

$$T = \alpha + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5 + b_6X_6 + b_7X_7 + b_8X_8 + b_9X_9 + b_{10}X_{10} + b_{11}X_{11} + b_{12}X_{12} + \mu$$

Where T= Improved Production Technologies adopted (Adoption score)

Y = Adoption of Improved Rice Production Technologies (1=Adoption, 2= Non-adoption)

α = constant term

$b_1 - b_{12}$ = regression coefficients

μ = Error term

X_1 = Age: (years)

X_2 = Sex; (male = 1, female = 0)

X_3 = Education; (measured by the number of years spent in formal education)

X_4 = Marital status, (1 for being married and 0 otherwise)



- X₅ = Household size (number of persons)
X₆ = Credit; (dummy variable for receiving credit = 1 and 0 for not received).
X₇ = Rice farm land. (hectares)
X₈ = Membership in social activities (number of groups)
X₉ = Extension contact (number of visit)
X₁₀ = Farming experience (years)
X₁₁ = Income. (Naira)
X₁₂ = Rice output (Kg)
 μ = error term

Mean Score

$5+4+3+2+1 = \frac{15}{3} = 3$ any value between 3 and above is considered significant.

- 1= Strongly disagree
2= Disagree
3= Undecided
4= Agree
5= Strongly agree

RESULT AND DISCUSSION

Socio-economics Characteristic of the Respondents

The result from Table reveals the socioeconomic characteristics of the respondents, the findings shows that 38.4% and 23.8% of the respondents were within the ages of 33-42 years and 23-32 years respectively. Also 19.5% and 14.6% of the respondents were within the ages of 43-52 years and 53-62 years respectively, only 3.7% of the respondents were within the ages of 63 and years in the study area. The average age of 43 years among the respondents implies that most of the respondents were within their active ages of production in agriculture and will be willing to adopt technologies and targeted at reducing drudgery and improving their living standard.



Table 2: Distribution of Respondents based on Age, Sex, Marital Status, Household size and Educational level (n = 185)

Age	Frequency	Percentage	Mean
23-32	44	23.8	
33-42	71	38.4	
43-52	36	19.5	43
53-62	27	14.6	
63 and above	7	3.7	
Sex			
Female	48	25.9	
Male	137	74.1	
Marital status			
Single	31	16.8	
Married	154	83.2	
Household size			
1-10	98	53.0	
11-20	62	33.5	
21-30	20	10.8	9
31-40	4	2.2	
41 and above	1	.5	
Educational level			
Non-Formal	20	10.8	
Primary	19	10.3	
Secondary	70	37.8	
Tertiary	76	41.1	

Source: Field Survey (2023)

The study is similar to that of Bose, *et al* (2020) who found that the average age of the farmers was 40.3 years. However, the result was contrary with that of Hussaini, *et al* (2020) who reported that the average age of the rice farmers was 46 years in Kebbi State. Similarly, Afolami, *et al* (2012) conducted a socio-economic analysis of rice farmers in Nigeria. The mean age of the farmers was found to be 48 years. The result further shows that majority (74.1%) of the respondents were male, while 25.9% of the respondents were female. This implies that the male had dominance over the female gender in the study area which could be attributed to cultural and religious believes which hinders women participation in tedious agricultural activities in the study area. The result is similar with that of Tiku, *et al* (2017) who discovered that about 78% of the respondents were males compared to 22% females.

The findings further showed that majority (53%) of the respondents had a household size of 1-10 persons, while 33.5% of the respondents had a household size of 11-20 persons, only 10.8%, 2.2% and 0.5% of the respondents had a household size of 21-30 persons, 31-40 persons and 41 and above persons respectively. The average of 9 persons per household implies that most of the respondents had relatively large household sizes in the study area which also shows that respondents had relatively cheap source of labour i.e family labour. The result disagrees with that of Hussaini *et al*. (2020) who reported that average number of persons in a household was approximately 11. Also, Tiku *et al*. (2017) reported that respondents with



household size ranging between 9-12 persons were about 28% and they are at the same time the highest family size recorded in the study area.

The result further shows that 41.1% of the respondents had attended tertiary levels of education, while 37.8% of the respondents had attended secondary levels of education, also 10.8 and 10.3% of the respondents had attended non-formal and primary levels of education respectively. This implies that most of the respondents had attended one form of education or the other in the study area, it also implies that respondents will likely be willing to adopt technologies in agricultural production in the study area. This result disagrees with Ayoola *et al.* (2011) who reported that literacy level was generally low among the respondents, about 32 percent of the men and less than fifty percent of the women having only formal education.

Primary occupation, Farming experience, Membership of Cooperative, Access to credit and Source of finance

The result from Table 3 shows that 45.9% of the respondents were into farming as their primary occupation, while 23.3%, 18.9% and 10.8% of the respondents were civil servants of artisans and traders respectively in the study area. This implies that most of the respondents were farmers and had farming as their primary occupation which could be attributed to high level of adoption of technologies by the respondents so as to improve their livelihood.

Table 3: Distribution of the Respondent based on Primary occupation, farming experience, Membership of cooperative, Access to credit and Source of financing farm business (n = 185)

Primary occupation	Frequency	Percentage	Mean
Farming	85	45.95	
Civil service	45	23.32	
Traders	20	10.81	
Artisans	35	18.92	
Farming experience			
1-10	132	71.4	
11-20	26	14.1	
21-30	18	9.7	10.25
31-40	6	3.2	
41 and above	3	1.6	
Membership of cooperative			
No	82	44.3	
Yes	103	55.7	
Access to credit			
No	125	67.6	
Yes	60	32.4	
Source of finance			
	Frequency	Percent	
Bank of Agriculture	38	20.5	
Commercial Bank	1	.5	
Microfinance Bank	11	5.9	
Personal Saving	135	73.0	

Source: Field Survey (2023)



The findings further showed that majority (71.4%) of the respondents had 1-10 years of farming experience, while 14.1%, 9.7%, 3.2% and 1.6% of the respondents had 11-20, 21-30, 31-40 and 41 and above years of farming experience respectively with an average 10.3 years of farming experience. This implies that most of the respondents were long time farmers and had a vast experience in agricultural production especially crop production in the study area.

The result further shows that majority (55.7%) of the respondents belong to one cooperative or another while 44.3% of the respondents were not members of any cooperative. This implies that majority of the respondents belongs to one form of cooperative or another which helps to increase respondents’ access to credits, inputs and extension services in agricultural production especially among crop farmers in the rural areas. The result tallies that of Hussaini *et al.* (2020) who reported that farmers had an average of 7 years of membership of cooperatives in the study area. The result also shows that majority (67.6%) of the respondents had no access to credits, while 32.4% of the respondents had access to credits in the study area. This implies that most of the respondents had no access to credit which could affect their level of production. The result further shows that majority (73%) of the respondents had personal savings as their major sources of finance, while 20.5% of the respondents had bank of agriculture as their major sources of finance, only 5.9% and 0.5% of the respondents had microfinance and commercial banks as their major sources of finance in the study area. This implies that most of the respondents depended on their personal savings rather than institutional sources of finance which could be attributed to high interest rates and collaterals for credits.

Table 4: Distribution Based on Respondents Land tenure status, Farm size, Source of labour, Source of information and Extension visit (n = 185)

	Frequency	Percentage	Mean
Land tenure status			
Purchased	56	30.3	
Hired	60	32.4	
Inheritance	69	37.3	
Farm Size			
1-5	169	91.4	
6-10	8	4.3	
11-15	4	2.2	2.95
16-20	2	1.1	
21 and above	2	1.1	
Source of Labour			
Family	60	32.4	
Community	30	16.2	
Hired/Paid	95	51.4	
Source of information			
Research Institutions	27	14.6	
Agro-dealers	9	4.9	
Cooperative Societies	8	4.3	
Media	67	36.2	
Friends and Relatives	74	40.0	

Source: Field Survey (2023)



The result from Table 4 shows that 37.3% of the respondents owned their land through inheritance, 32.4% and 30.3% of the respondents had their land through hire and purchase respectively. This implies that most of the respondents had their land through purchase and hire only few, less than half of the respondents had their land through inheritance which is the cheapest source of land for agricultural production in the study area. The result also shows that most (91.4%) of the respondents had a farm size of 1-5ha, while 4.3% and 2.2% of the respondents had 6-10ha and 11-15ha of farm land respectively, only 1.1% of the respondents had a farm size of 16-20ha of land in the study area. This implies that most of the respondents were small scale farmers and will be willing to adopt technologies to improve their productivity and living standards in the study area. The result also reveals that majority (51.4%) of the respondents had hired/paid labour as their source of labour for agricultural activities, while 32.4% and 16.2% of the respondents had family and community labour as their major sources of labour in the study area. This implies that most of the respondents had cheap family and community labour as their major sources of labour which is cheaper and more reliable in agricultural production especially among rural farming household.

The findings also showed that 40% of the respondents had friends and relatives as their major sources of information, while 36.6% of the respondents had media as their major sources of information, also 14.6% of the respondents were found to have research institutions as their major sources of information, only 4.9% and 4.3% of the respondents had agro-dealers and cooperative societies respectively as their major sources of information in the study area. This implies that respondents had different sources of information on improved agricultural production practices which could greatly contribute to high level of adoption of technologies among rural farming household.

Variety of Rice Adopted by the Respondents

The result from the findings on Table 5 shows that 40.5% of the respondents adopted FARO variety of rice, while 30.3% and 29.2% of the respondents had adopted NERICA and Local variety of rice respectively in the study area. This implies that most of the respondents had adopted improved rice varieties with less than half of the respondents planting local rice which have little or no resistance for diseases and drought. Africa Rice’s research activities in Nigeria led to the introduction of new rice varieties, including the New Rice for Africa “NERICAs” and the Federal Agriculture Research Oryza (FARO) varieties (Context Network and Sahel Capital 2016). The major seed varieties grown in Nigeria are the FARO varieties. Several seed development companies/organisations developed higher-quality, improved seeds. Klynveld Peat Marwick Goerdeler Advisory Services (KPMG, 2019).

Table 5: Distribution of the Respondents based on Varieties Adopted

Varieties	Frequency	Percentage
Local Variety	54	29.2
NERICA	56	30.3
FARO 44	75	40.5
Total	185	100.0

Source: Field Survey (2023)

Level of Awareness on Improved Rice Production Technologies

The result from Table 6 shows that respondents were highly aware of the use of recommended improved variety, planting seed at recommended seed rate, timely planting and



planting spacing of 25x20 as indicated by mean scores of 4.42, 4.37, 4.14 and 4.19 above the threshold of 3.0. This is followed by recommended method of fertilizer application, proper weeding and disease control with mean scores of 4.18, 4.12 and 4.01 above the mean threshold of 3.0 in the study area. Also, the findings showed that most of the respondents were aware of the use of recommended land preparation, fertilizer application, pest control and harvesting techniques with a mean score of 3.47, 3.97, 3.96 and 3.88 above the threshold of 3.0 mean. This implies that all the respondents were aware and highly aware of IRPTs in the study area. This also implies that most of the respondents will have high yield /output in rice production in the study area.

Table 6: Respondents Distribution Based on Level of Awareness of IRPT's

Improved rice production technologies (IRPT's)	Mean	Decision
Recommended Land Preparation	3.47	Aware
Use of Recommended Improved Variety	4.42	highly aware
Planting Seed at Recommended Seed Rate	4.37	Highly aware
Timely Planting	4.14	Highly aware
Planting Spacing of 25x20	4.19	Highly aware
Recommended Fertilizer Application	3.97	Aware
Recommended Method of Fertilizer Application	4.18	Highly aware
Proper Weeding	4.12	Highly aware
Disease Control	4.01	Highly aware
Pest Control	3.96	Aware
Harvesting Techniques	3.88	Aware

Source: Field Survey (2023)

Factors Influencing the Adoption of Improved Rice Production Technologies

The result from Table 7 showed that household size had a positive coefficient of .078 and statistically significant (P<0.01) in influencing the adoption of rice production technologies. This implies that a unit increase in household size of the respondents will result to increase in adoption of rice technologies vice-versa. Also, age was found to be positive and statistically significant (P<0.05) influencing the adoption of rice production technologies. This implies that a unit increase in age of the respondents will lead to increase in adoption of rice production technologies in the study area. This implies that increase in adoption of rice production technologies increases with increase in age of the respondents. The findings also showed that farmers' cooperatives membership was positive and statistically significant (P<0.05) in influencing adoption of rice production technologies. This implies that increase in membership of farmers' cooperatives will lead to increase in adoption of rice production technologies which could also be attributed to the fact that cooperative members tends to give high access to extension services and other inputs compared to non-cooperative members in agricultural production. The findings further showed that land size was negative and statistically significant (P<0.05) in influencing the adoption of rice production technologies, which implies that decrease in farm size could lead to increase in adoption of rice production technologies in the study area. This could be attributed to the facts that if a farm size increases there is high tendency of increase in yield of rice even if respondents do not adopt any improved rice production technologies. The result further shows that rice income was negative and significant at (P<0.05) in influencing adoption of rice production technologies, which also



implies that increase income from rice could result to decrease in adoption of improved rice production technologies which shows that rice farmers tends to be reluctant and possibly abandoned agricultural production and move to urban areas to establish other forms of business which in turn leads to decrease in adoption of rice production technologies in the study area.

Table 8: Socio-economic factors influencing adoption of improved rice production technologies

Variables	Coefficient	Std. error	Z-value
(Constant)	3.969	.907	4.375
Age	-.029	.011	-2.554**
Sex	.396	.211	1.879*
Education level	-.024	.096	-.254NS
Marital status	-.032	.254	-.125NS
Household size	.078	.022	3.521***
Access to credit	-.325	.214	-1.521NS
Farm size	-.013	.006	-2.059**
Farmer's cooperative	.405	.202	2.006**
Number of extension visit	-.007	.026	-.271NS
Farming experience	-.002	.016	-.141NS
Rice income	-1.074E-007	.000	-2.054**
Rice output	-6.089E-005	.000	-.488NS
F –statistic = 2.941***			
Pseudo R²= 0.214			

***= P<0.01, **= p<0.05, *= p< 0.10, NS= Not significant

Source: Field Survey (2023)

The result further shows that sex was positive and significant (P<0.01) in influence the adoption of rice production technologies among the respondents in the study area. This implies that the higher the level of men participation in rice production the more the adoption of rice production technologies which could be attributed high level of dependence on men from relatively large household sizes in the study area and demand for food and other necessities makes men to adopt technologies so as to increase income and yield from rice production in the study area.

Constraint Faced by Rice Farmers in Adoption of Improved Rice Production Technologies

The result from Table 9 reveals that the major constraints faced by the respondents in adopting rice production technologies were high cost of farm input, inadequate recommended rice varieties, low level of awareness, inadequate extension agents' access, low access to credit, climatic change and high cost of input with mean scores of 3.79, 3.19, 3.28 3.39, 3.42, 3.14 and 3.59 respectively. In addition, disease and pest, drought, inadequate storage facilities, inadequate processing facilities, complexity in adopting improved rice varieties and low market access with mean scores of 2.84, 2.85, 2.75, 2.77, 2.58 and 2.78 respectively were also among the constraints to adoption of rice production technologies. This implies that though respondents had adopted the rice production technologies but they were faced with several constraints in the study area.



Table 9: Constraints to adoption of improved rice production technologies

Constraints	VS	S	FS	NS	Mean	Decision
High cost of farm input	159(85.9)	15(8.1)	10(5.4)	1(0.5)	3.79	Very severe
Inadequate of recommended rice varieties	77(41.6)	69(37.3)	37(20.0)	2(1.1)	3.19	Very severe
Low level of awareness	80(43.2)	78(42.2)	25(13.5)	2(1.1)	3.28	Very severe
Inadequate extension agents access	114(61.6)	43(23.2)	14(7.6)	14(7.6)	3.39	Very severe
Disease and pest problems	53(28.6)	55(29.7)	72(38.9)	5(2.7)	2.84	Severe
Drought problems	51(27.6)	65(35.1)	59(31.9)	10(5.4)	2.85	Severe
Inadequate storage facilities	55(29.7)	48(25.9)	63(34.1)	19(10.3)	2.75	Severe
Inadequate processing facilities	58(31.4)	52(28.1)	49(26.5)	26(14.1)	2.77	Severe
Low accessibility of credit	114(61.6)	46(24.9)	13(7.0)	12(6.5)	3.42	Very severe
Climatic change	66(35.7)	86(46.5)	25(13.5)	8(4.3)	3.14	Very severe
High cost of input	137(74.1)	30(16.2)	9(4.9)	9(4.9)	3.59	Very severe
Complexity in adopting improved rice varieties	61(33.0)	26(14.1)	58(31.4)	40(21.6)	2.58	Severe
High cost of labour	143(77.3)	29(15.7)	10(5.4)	3(1.6)	3.69	Very severe
Low market access	60(32.4)	42(22.7)	56(30.3)	27(14.6)	2.73	Severe

Source: Field Survey (2023) Note: mean score >2.50 = severe constraint, <2.50 = not severe constraint: values in parentheses are percentages. **VS** =very severe, **S**= severe, **FS** = fairly severe **NS**= not severe

CONCLUSION AND RECOMMENDATIONS

The study Concluded that age, household size, membership of cooperative societies and sex were some the factors influencing the adoption of improve rice production technologies It is recommended that Rice farmer’s cooperatives should create more awareness on importance of rice production technologies, Government and NGOs should intervene and enhance frequent extension contacts/visits and Government/financial institutions should provide credit facility with single digit interest rates to rice farmers.

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