



DETERMINANTS OF THE UTILIZATION OF AGRO-PROCESSING, PRODUCTIVITY ENHANCEMENT AND LIVELIHOOD IMPROVEMENT SUPPORT PROJECT AMONG RICE FARMERS IN KANO STATE, NIGERIA

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ABSTRACT

The study evaluates the determinants of the utilization of the Agro-Processing, Productivity Enhancement, and Livelihood Improvement Support (APPEALS) Project among rice farmers in Kano State, Nigeria. A multi stage sampling techniques was used in selecting 319 respondents. Data were collected using structured questionnaires and were analysed using descriptive and inferential statistics. The results revealed that the mean utilization percentage of the Project is 62.6% and more than (57.2%) of the respondents utilized 11 and above activities and are considered as high utilization category, factors influencing the utilization of the project include age (0.015) at 1 percent level of probability, sex (0.045) at 5 percent level of probability, household size (1.025) at 1 percent level of probability, extension contact (0.025) at 1 percent level of probability, and membership of cooperative (0.060) at 1 percent level of probability were all found to influence participation in the APPEALS Project at 1% and 5% levels of probability. It further shows that beneficiaries faced challenges such as high costs of production, ranked 1st, inconsistency in extension services delivery, ranked 2nd and market price fluctuations ranked 3rd. This study can be concluded that beneficiaries and non-beneficiaries were at their productive age, and the beneficiaries of the APPEALS Project tremendously utilized the components of the Project very well. The level of the utilization of the project components were influenced by some socio-economic and institutional factors and. However, the beneficiaries of the project were constrained by certain hindrance such as high cost of production inputs. The study recommends that reducing the price fluctuation, and extending the project benefits beyond its direct participants by fostering inclusiveness of non-beneficiaries from other communities will widen or strengthen the impact.

Keywords: Determinant, Project, Rice Farmers, Income, Utilization.

INTRODUCTION

Nigeria has the potential to produce the quantity of rice it needs and even more for export (Mohammed *et al.*, 2019). Some international organizations for example World Bank, United State Agency for International Development (USAID) have contributed immensely in rice farming by coming up with agricultural development programs such as APPEALS through provision of improved seed varieties and irrigation schemes and that has increased rice production (Mohammed *et al.*, 2019). However, most of Nigeria's rice processing equipment cannot process rice in line with international standard, so as to meet people's demand for high-standard rice (Tijjani & Ahmed, 2024). Although Nigeria's modern rice processing technology has made progress compared to previous years, by reducing the main problem of stones in rice (Tijjani & Ahmed, 2024). The Agro-Processing, Productivity Enhancement and Livelihood Improvement Support (APPEALS) Project is a six-year Project developed by the Federal Ministry of Agriculture and Rural Development (FMARD) in collaboration with the World Bank and other stakeholders. The Project involves the Project beneficiaries, research institutions, extension agents and opinion leaders each contributing towards the success of the Project. The Project was designed to support policy thrusts of food security, local production, job creation and economic diversification (FMARD, 2019). In Kano State, 10,000 targeted beneficiaries were earmarked by the project, across the value chains of rice, tomatoes and wheat, including women and youth empowerment. APPEALS Project is targeted at improving agricultural productivity, improving agro-processing and value addition, enhancing market access for processed products, giving support in infrastructure for agri-business, improving Livelihood,



improving capacity building and knowledge sharing for farmers and agro-processors and having effective project management and coordination (FMARD, 2019). All these were aimed at boosting the livelihood activities of the farm families. That is activities through which people earn a living and support their basic needs, such as food, shelter, and clothing. It encompasses all the resources, skills, and work that enable individuals or households to sustain themselves (Khan *et al.*, 2020). Livelihoods can include a variety of sources, such as farming, fishing, business, labor, and services, depending on the individual's location, skills, and circumstances. Essentially, it's about how people make a living and ensure their economic survival (Senekane *et al.*, 2022).

In Kano State, there are age-long farming practices that affect production, and factors like over reliance on rain fed agriculture, small landholding, poor planting materials, low fertilizer application, improper processing methods and the weak agricultural extension system remain rice farmers' productivity daunting challenges. Consequently, this has necessitated the Federal Government in collaboration with the World Bank to implement the APPEALS Project in Kano State, which started in 2017. This is in order to address the identified problems such as unavailability of improved inputs, high production costs, post-harvest losses, price fluctuations, limited access to finance, poor market, low productivity, poor processing, which were not addressed by the previous Projects that have been implemented in the State, with the expectation that APPEALS at the end of its implementation, problems of low productivity, poor market and poor processing would have been the thing of the past and the livelihood of the farmers would have been improved with additional support from the Project. Therefore, the implementation of APPEALS Project requires feedback on the impact of the Project on the participating beneficiaries and this is to determine the achievement of the Project objective of the Federal Government of Nigeria on its effects on the life of small and medium scale rice farmers. Additionally, since the implementation of the Project in the selected States, only few studies have been carried out to investigate the determinants of the utilization of the Agro-Processing, Productivity Enhancement, and Livelihood Improvement Support (APPEALS) Project among rice farmers in Kano State, Nigeria. For example, Mamman *et al.* (2023) and APPEALS Project Enugu State Coordination Office (2021) conducted a study on the impact of the APPEALS Project in Kogi State and in Enugu State. However, both studies were limited to cassava value chain and social impact on beneficiaries. This has necessitated the study to assess the following research objectives:

- i. describe the socio-economic, and institutional characteristics of the APPEALS Project beneficiaries and non-beneficiaries in the study area;
- ii. determine the level of utilization of APPEALS Project components among beneficiaries;
- iii. determine the factors influencing the utilization of APPEALS Project components among the beneficiaries; and
- iv. identify and describe the constraints encountered by the APPEALS Project beneficiaries.

MATERIALS AND METHODS

The Study Area

The study was conducted in Kano State, Nigeria. The area lies between latitude 10 30° N and 13°N and between Longitude 7 40° and 10 35° E (Yusuf *et al.*, 2023). The state borders Katsina State to the north-west, Jigawa State to the north-east, and Bauchi and Kaduna States to the south. It has forty-four (44) Local Government Areas (LGAs) and three (3) agricultural zones. The zones include Dambatta, Gaya and Rano. The population was projected to be 15,892,800 people in 2024 (National Bureau of Statistics, 2024).

A tropical wet and dry climate prevails over the state and it has two distinct seasons, the wet and dry seasons. The wet season lasts between May and early October while the dry season lasts between November and April. Annual rainfall varies from 600 mm to 1200 mm in the Guinea savannah to 300 mm to 600 mm in the Sudan savannah. The mean annual temperature is about 26°C in the coolest months (December/January) and 31°C in the hottest months (April/May). The average annual relative humidity is 31.1 percent and average monthly relative humidity ranges from 11 percent in March to 68 percent in August. Agriculture is one of the most important pillars of the



State's economy with about 75 percent of the populace engaged directly or indirectly in this economic activity (Atah *et al.*, 2024). The outlying districts of Kano State in Nigeria practice both subsistence and commercial agriculture, and they cultivate various crops, including: millet, cowpeas, sorghum, maize and rice for local consumption while groundnut and cotton for export and industrial purposes (Magaji *et al.*, 2020).

Sampling Technique and Sample Size

Therefore, a multistage sampling procedure was used to select respondents for the study. In the first stage, Rano Zone was purposively selected because it is the zone that is used for the implementation of the APPEALS Project on rice value chain in the State. In the second stage, two LGAs were purposively selected because they are the largest producers of rice in the State and for having the highest number of beneficiaries of APPEALS Project. These LGAs are: Kura and Garun Malan. Thirdly, for the beneficiaries, four communities were purposively selected from each of the two LGAs based on the extent of participation in APPEALS Project, this gave a total of eight (8) communities. These are Karfi, Kura, Bugau and Agolas for Kura LGA. For Garun Malan LGA these are Garun Malan, Garun Babba, Jarman Baka and Chiromawa. Similarly, for the non-beneficiaries, a corresponding four neighboring communities were purposively selected from each and the same LGAs with the beneficiaries. Also, a total of eight (8) communities were selected. These are Danhassan, Gamadan, Gundutse and Imawa for Kura LGA, and Daurawar Sallau, Makwaro, Kadawa and Rugaduka for Garunmalan LGA. This gave a total of 16 communities for the study. The lists of the beneficiaries in the chosen communities were obtained from the monitoring and evaluation officers of APPEALS Project at KNARDA headquarter Kano State. While the lists of non-beneficiaries in the chosen communities were obtained from the chairmen of the various co-operative societies or associations that the farmers belong to in the respective communities giving a total sample of 319 for the study. In the fourth and final stage therefore, the sample sizes were selected using systemic random sampling for both beneficiaries and non-beneficiaries.

Method of Data Collection

Data for this study was obtained from primary source. Structured questionnaire was designed to obtain information from the respondents in the study area.

Method of Data Analysis

The study was analysed using both descriptive and inferential statistics. Descriptive statistics involves the measures of central tendency such as frequencies, percentages, means and standard deviation and the inferential statistics used was Tobit regression model.

Tobit Regression

Tobit regression model was employed to determine the factors influencing utilization of APPEALS Project Tobit assumes latent unobservable Y_i^* ; in which linear y depends on; X_j via a parameter vector β and a normally distributed error term U_i ; captures the random influence of this relation. The model for the regression is expressed as:

$$Y_i^* = \beta_0 + \beta_1 X_{i1} + U_i \quad \dots (1)$$

$$Y_i = Y_i^* \text{ if } \beta_0 + \beta_1 X_{i1} + U_i > 0 \quad \dots (2)$$

$$Y_i = 0 \text{ if } \beta_0 + \beta_1 X_{i1} + U_i < 0 \quad \dots (3)$$

(Adopted from Gwadabe *et al.* 2024).

Where: Y_i = utilization index scores for i^{th} farmer Y_i^* = is the latent variable and the solution to utility maximization problem of intensity or level of utilization subjected to a set of constraints per household and conditional on being above limit. X_i is the vector of factors influencing utilization, β_i is the vector of unknown parameters and U_i = the error term which is normally distributed with a mean of 0 and variance σ^2 ,

The model is specified as:

$$Y_i^* = \beta_0 + \beta_2 X_{i2} + \beta_3 X_{i3} + \beta_4 X_{i4} + \beta_5 X_{i5} + \beta_6 X_{i6} + \beta_7 X_{i7} + \beta_8 X_{i8} + \beta_9 X_{i9} + \beta_{10} X_{i10} + U_i \quad \dots (4)$$

$I = 1, 2, 3, 4, 5, 6, \dots, 10$

X_{i1} = Age (in years),



X_2 = Educational (Non-formal education = 1, Primary education = 2, Secondary education = 3 and Tertiary education = 4),
 X_3 = Farm Size (hectares),
 X_4 = Household Size (Number of individuals in the house),
 X_5 = Farming Experience (years),
 X_6 = Sex (Male =1, Female=0),
 X_7 = Income (₦)
 X_8 = Marital Status (Married = 1, Widow = 2, Divorce = 3, Single = 4),
 X_9 = Extension Contact (no of contacts/year),
 X_{10} = Access to Credit (yes/no) and
 X_{10} = Membership of Association (Member = 1 and Non-member = 0)
 U_i = the error term
 β_0 is constant
 β_1 - β_{10} is regression coefficients.

RESULTS AND DISCUSSION

Socio-Economic and Institutional Characteristics of Respondents

Age

The result of the study in Table 1a shows that the majority (31.2% and 34.5%) of both beneficiaries and non-beneficiaries cultivating rice in the study area were within the age bracket of 31 - 40 years. The mean ages are 40.3 and 42.7 for beneficiaries and non-beneficiaries, suggesting that the respondents are within the active and productive age, which implies that younger farmers are more likely to engage in agricultural development programs, possibly due to their openness to adopting innovative practices. This finding is in tandem with findings of Bello *et al.* (2021) who found that participants and non-participants of Youth-in-Agribusiness (YIA) program in Ogun and Ondo States of Nigeria had average age of 31 years.

Educational Qualification

Table 1a of the study reveals that majority (29.9%) of the beneficiaries and a little portion (19.4%) of the non-beneficiaries possessed at least primary education. This implies that there was high literacy level among the respondents in the study area which enhances farmers' ability to understand and apply modern farming techniques, thus increasing the likelihood of benefiting in agricultural projects. This finding is not in tandem with Bonouzin *et al.* (2022) who revealed that few (27%) maize farmers and (15%) cotton farmers in the cotton growing zone of Benin had formal education.

Farm Size

Farm size results among the two groups reveal that majority (49.4% and 73.3%) of both beneficiaries and non-beneficiaries cultivating rice in the study area had a farm size of 1.5-2 hectare and 0.5-1 hectare. beneficiaries had a mean farm size of 1.3 hectares, while non-beneficiaries had mean farm size of 1.0 hectare, indicating that beneficiaries may have more resources or access to land. This implies that the rice farmers in the study area are composed of small-scale farmers (farming 1-5 hectares of land) hence, desired to be supported under the APPEALS Project as the project was meant for such category of farmers. A similar result was obtained by Mukaila *et al.* (2021) who found that the rural women in Enugu State, Nigeria had an average of 1.3 ha farm size.

Household Size

The result in Table 1a shows that 32.5% and 41.8% of beneficiaries and non-beneficiaries respectively had 6 – 10 people as their household size, and a mean of 6.4 and 6.8 for beneficiaries and non-beneficiaries respectively. This implies that farming households had a good source of family labour for farming enterprise. Therefore, they may rely more heavily on farming as their primary livelihood source, driving their engagement in programs that boost agricultural productivity. This finding is not in consonance with the findings of Helon *et al.* (2022) who found that more than half of the respondents had less than 4 members in their household in Adamawa State Nigeria.



Farming Experience

The results further show that, majority (33.8%) of the beneficiaries and a little portion (14.5%) of the non-beneficiaries had 11-15 years of farming experience, the beneficiaries had a mean farming experience of 14.2 years, while non-beneficiaries had a mean farming experience of 12.8 years, highlighting that beneficiaries tend to be more experienced in rice farming, thereby enabling them to likely exhibit greater expertise. This finding is contrary to the findings of Umar *et al.* (2020) who found that an average farming experience of beneficiaries was twenty years, while non-beneficiaries had around ten years average farming experience.

Sex

In Table 1a the result further shows that 79.2% of the beneficiaries were male while 69.1% of the non-beneficiaries were male. This indicates a predominance of male participation in the APPEALS project and access to agricultural interventions, while the relatively lower participation of women among beneficiaries (20.8%) suggests the potential gender disparities requiring targeted interventions to enhance inclusivity. This finding is in line with that of Balogun *et al.* (2021) who revealed that male farmers dominated all the rice farmers in Badagry Local Government Area, Lagos State with few female farmers participated. However, this may not mean that men in the study area are better rice farmers than women, rather the patrilineal nature of African societies has made possible for men to have more access to more productive resources than their female counterparts.

Income

Additionally, the result of the study in Table 1a shows that the majority of the beneficiaries (63.6%) and the non-beneficiaries (46.1%) realized total farm income above ₦400,000, the mean total farm income of both beneficiaries and non-beneficiaries was ₦814,104 and ₦758,556 respectively. Aso, the result shows that the majority (90.9%) of the beneficiaries and the non-beneficiaries (66.7%) realized total non-farm income above ₦400,000. Beneficiaries had a mean total non-farm income of ₦410,000, while the non-beneficiaries had a mean total non-farm income of ₦320,000. This implies that the project's beneficiaries earned higher average farm and non-farm income than the non-beneficiaries due to the utilization of the APPEALS project, highlighting the project's effect in promoting the beneficiaries' financial freedom. This finding is at variance with findings of Oloyede *et al.*, (2020) who found that the annual mean income of the rice farming household was ₦501,379 in Kwara State, Nigeria.

Marital Status

Furthermore, in Table 1a the results reveal that majority (71.4%) of the beneficiaries were married and majority (66.7%) of the non-beneficiaries were also married. This could reflect the culture and norms of the inhabitants of the study area where early marriage is a common practice. This finding is in line with Helon *et al.* (2022) who reported that majority of participants in Growth Enhancement Support Scheme were married in Adamawa State Nigeria.

Extension Contacts

Similarly in Table 1a the results reveal that majority (61.0%) of the beneficiaries and a significant proportion (46.1%) of the non-beneficiaries had 3-5 extension contact, beneficiaries had a mean of 4.5 extension contacts in 2024, whereas non-beneficiaries had a mean of 2.4 extension contacts in the same year. This implies that beneficiaries had better access to extension services, which could lead to obtaining higher yield and income as reported in this study. This finding contradicts the finding of Thu (2023) who reported that the average extension visit to the participants was 2 times per rice farming period in Delta Region of Myanmar.

Access to Credit

The results in Table 1a reveal that a higher proportion (67.5%) of beneficiaries had access to credit while only 36.9% of the non-beneficiaries had access to credit. This implies that with credit facilities, beneficiaries are encouraged to invest in farming and also stimulate participation in agricultural development projects. This corroborates the findings of Kehinde & Ogundeji (2022) who revealed among cocoa farmers that majority of the respondents had access to credit in South-western Nigeria.



Credit received

Results on credit show that only (6.5%) of the beneficiaries and (2.4%) of the non-beneficiaries received credit ranging from ₦400,001 – ₦600,000, with a mean of ₦162,525.97 credit for beneficiaries and a mean of ₦137,196.97 credit for non-beneficiaries. This means that rice farmers in the study area need more amount of credit to expand their rice farming thereby increasing their productivity. This result is contrary to the findings of Lawal *et al.* (2023) who found that access to agricultural credit positively influences productivity among smallholder rice farmers in Northern Nigeria.

Membership of Association

Similarly, membership of association was higher (75.3%) among beneficiaries and high (61.2%) membership of association among the non-beneficiaries, which facilitates access to project facilities such as credit and extension services. The finding agrees with findings of Opeyemi (2020) who revealed that majority of the small-scale farmers in Ekiti State Nigeria belong to cooperative organization. While only few members do belong to any cooperative organization.

Duration in Association

Result in table 1a shows that, majority (27.3%) of the beneficiaries and a little portion (6.0%) of the non-beneficiaries had spent 11-15 years in cooperative association, the beneficiaries had a mean duration in association of 10 years, while non-beneficiaries had a mean duration in association of 8 years, this implies that the beneficiaries and non-beneficiaries of APPEALS project in the study area have appreciated the benefits associated with belonging to farmers association, such as knowledge sharing among members and access to support from government and non-governmental organizations. This finding agrees with the finding of Ajayi *et al.* (2022), who revealed that cooperative membership improves farmers' access to credit, shared resources, and extension services, enhancing productivity in Ogun state, Nigeria.



Table 1a: Socio-Economic and Institutional Characteristics of the Respondents (n= 319)

Variables	Category	Beneficiary = 154		Non-Beneficiary = 165	
		Frequency	Percentage	Frequency	Percentage
Age	15-20	8	5.2	1	0.6
	21-30	26	16.9	51	30.9
	31-40	48	31.2	57	34.5
	41-50	44	28.6	34	20.6
	51-60	28	18.2	22	13.3
	Total	154	100.0	165	100.0
	Mean	40.3			42.7
	Standard dev.	9.1			9.8
Educational Level	Non-formal education	40	25.9	43	26.1
	Primary	46	29.9	32	19.4
	Secondary	36	23.4	68	41.2
	Tertiary education	32	20.8	22	13.3
	Total	154	100.0	165	100.0
	Mean	1.3			1.0
	Standard dev.	0.6			0.5
Farm Size	< 0.5 hectares	6	3.9	6	3.6
	0.5-1 hectares	68	44.2	121	73.3
	1.5-2 hectares	76	49.4	36	21.8
	> 2 hectares	4	2.5	2	1.2
	Total	154	100.0	165	100.0
	Mean	1.3			1.0
	Standard dev.	0.6			0.5
Household Size	1-5	28	18.2	48	29.1
	6-10	50	32.5	69	41.8
	11-15	36	23.4	40	24.2
	16-20	22	14.3	8	4.8
	21-25	18	11.7	0	0.0
	Total	154	100.0	165	100.0
	Mean	6.4			6.8
	Standard dev.	1.9			2.1
Farming Exp	1-5 years	16	10.4	25	15.2
	6-10 years	44	28.6	82	49.7
	11-15 years	52	33.8	24	14.5
	16-20 years	26	16.9	18	10.9
	21-30 years	16	10.4	16	9.7
	Total	154	100.0	165	100.0
	Mean	14.2			12.8
	Standard dev.	7.3			6.9
Sex	Male	122	79.2	114	69.1
	Female	32	20.8	51	30.9
	Total	154	100.0	165	100.0
Total farm Income	₦100,000-₦200,000	10	6.5	10	6.1
	₦201,000-₦300,000	22	14.3	42	25.5
	₦301,000-₦400,000	24	15.6	37	22.4
	> ₦400,000	98	63.6	76	46.1
	Total	154	100.0	165	100.0
	Mean	₦814,104			₦758,556
	Standard dev.	₦185,800			₦186,890

Source: Field Survey, 2024



Table 1b: Socio-Economic and Institutional Characteristics of the Respondents (n= 319)

Variables	Category	Beneficiary = 154		Non-Beneficiary = 165	
		Frequency	Percentage	Frequency	Percentage
Tot Non-farm Income	₦50,000-₦100,000	4	2.6	7	4.2
	₦101,000-₦200,000	0	0.0	6	3.6
	₦201,000-₦300,000	6	3.9	9	5.5
	₦301,000-₦400,000	4	2.6	33	20.0
	> ₦400,000	140	90.9	110	66.7
	Total	154	100.0	165	100.0
	Mean	₦410,000		₦320,000	
	Standard dev.	₦180,000		₦150,000	
Marital Status	Single	28	18.2	27	16.4
	Married	110	71.4	110	66.7
	Divorced	12	7.8	26	15.8
	Widow	4	2.6	2	2.4
	Total	154	100.0	165	100.0
Extension Contact	1-2 Contacts	60	38.9	89	53.9
	3-5 Contacts	94	61.0	76	46.1
	Total	154	100.0	165	100.0
	Mean	4.5		2.4	
	Standard dev.	3.0		2.2	
Access to Credit	Yes	104	67.5	61	36.9
	No	50	32.5	104	63.0
	Total	154	100.0	165	100.0
Total Credit Received	No Credit Received	50	32.5	104	63.1
	₦50,000-₦100,000	23	15.0	19	11.5
	₦101,000-₦200,000	31	20.1	18	10.9
	₦201,000-₦300,000	25	16.2	13	7.9
	₦301,000-₦400,000	15	9.7	7	4.2
	₦401,000-₦600,000	10	6.5	4	2.4
	Total	154	100.0	165	100.0
	Mean	₦162,525.97		₦137,196.97	
	Standard dev.	₦145,071.83		₦145,283.45	
Membership of Assoc.	Yes	116	75.3	101	61.2
	No	38	24.7	64	38.8
	Total	154	100.0	165	100.0
Duration in Assoc.	No Time Spent	38	24.7	64	39.0
	1-5 years	6	3.9	15	9.0
	6-10 years	34	22.1	62	37.6
	11-15 years	42	27.3	10	6.0
	16-20 years	18	11.7	8	4.8
	21-30 years	16	10.3	6	3.6
	Total	154	100.0	165	100.0
	Mean	10		5.9	
	Standard dev.	7.5		5.8	

Source: Field Survey, 2024

Utilization of APPEALS Project among Rice Farmers

Result in Table 2a indicates the mean utilization is 62.6%, indicating that there was high-level of utilization of APPEALS Project components and activities by the beneficiaries, which implies that the project has recorded success. Specifically, 94.2% of the beneficiaries utilized agrochemicals



provided by the project, 91.6% utilized improved seeds, 90.9% utilized personal protective equipment & kits. Also, only 22.7% of the APPEALS project beneficiaries utilized farm mechanization and 26.0% utilized spraying equipment provided by the project respectively.

However, no farmer utilized the inclusion of farmers into agribusiness supply chain (0.0%) and roads (0.0%) constructed by the project. This finding is not in tandem with Ntat *et al.* (2021) who reported that majority of the participants in Plateau State utilized 1-3 services, which indicated a low level of utilization among potato farmers.

Table 2a: Utilization of APPEALS Project Components among Beneficiaries (n=154)

APPEALS Project Components	Frequency	Percentage%
Agrochemicals	135	87.6
Spraying equipment	40	26.0
Improved seeds	141	91.6
Fertilizer	143	92.9
Personal Protective Equipment & kits	140	90.9
Grant	30	19.5
Motorized harvester use demonstration	137	88.9
Urea Deep Placement (UDP) Technique	140	90.9
Line transplanting	125	81.1
Improved harrowing	130	84.4
Mechanical thresher use	129	83.8
Farm mechanization	35	22.7
Linking farmers to market	70	45.5
Capacity building	150	97.4
Inclusion of farmers into agribusiness supply chain	0	00.0
Construction of access road	0	00.0

Source: Field Survey, 2024

Multiple Responses Allowed*

Note! The percentage mean was gotten by summing all the percentage values of the 16 respective variables (APPEALS Project Components), divided by total number of the components (16).

Level of Utilization of APPEALS Project

Result in Table 2b shows that only 16.2% of beneficiaries utilized 1 – 5 components of APPEALS Project, which is considered as low utilization category and 26.6% of beneficiaries utilized 6 – 10 components of APPEALS Project which is considered moderately utilized.

While, majority (57.2%) of the APPEALS Project beneficiaries utilized 11 and above of the Project components and are considered as a high utilization. The finding is not in tandem with Ntat *et al.* (2021) who reported that majority of the participants in potato project in Plateau State utilized 1-3 services, which indicated a low level of utilization among potato farmers.

Table 2b: Level of Utilization of APPEALS Project Components among Beneficiaries (n=154)

Extent of Utilization	No of Comps Utilized	Freq	%	Min	Max	Mean	SD
Low	1 – 5	25	16.2	1	14	10.02	3.59
Moderate	6 – 10	41	26.6				
High	11 and above	88	57.2				

Source: Field Survey, 2024

Factors Influencing the Utilization of APPEALS Project among the Rice Farmers

The result in Table 3 reveals that several socio-economic and institutional factors, such as age, sex, farming experience, farm size, access to credit, extension contact, education level, and cooperative membership, significantly influenced the utilization of the APPEALS Project. The constant term (β_0) (0.420) is statistically significant at 1% level, suggesting that there is an element of project utilization even in the absence of the explanatory variables. The results showed the Log



likelihood value of (-120.234), the Pseudo R^2 (0.715) and Prob > χ^2 (0.000), showed that the estimated model and set explanatory variables fit the data.

It shows that the age of the farmer is significant at 1% level of probability influencing project utilization, implying that the older farmers are more likely to utilize the APPEALS Project components more than the younger farmers. This means that as the age of the participants increases by one unit, there is a likelihood increase in utilization by 0.015 unit correspondingly. This can occur due to accumulation of experience in rice farming over time. This result contradicts the findings of Yerima *et al.* (2021) who found that age was significantly negative in their study of Impact of Commercial Agriculture Credit Scheme on Technical Efficiency of Rice Farming in Kano State, Nigeria.

Education level is also significant positively at 1% level of probability influencing utilization of APPEALS Project can improve farmers' ability to engage in many project's components activities. This implies that a unit increase in level of education of the beneficiaries, will lead to an increase in utilization by 0.050 units. The result is not in consonance with findings of Nwahia and Onyeabor (2021) who revealed that education had a negative coefficient, significantly influences participation in USAID-MARKETS II project among rice farming households in Ebonyi State Nigeria.

Also, farm size is positive and significant at 1% level of probability in influencing utilization of APPEALS. This implies that a unit increase in landholdings will lead to an increase in utilization by 0.030 units. Indicating that beneficiaries with larger farm sizes were better positioned to utilize the projects' interventions such as improved seeds, mechanization, and extension services thereby achieving higher yields and income. This is in line with the a priori expectation that farm size would have a significant positive influence on participation in APPEALS Project.

Similarly, household size is positively significant at 1% level indicating a strong influence on utilization. This implies that a unit increase in the number of dependents of the beneficiary will lead to a corresponding increase in the level of utilization of the APPEALS project, by 0.867 units, possibly this could be due to the advantage of family labour provided by a larger household size. This is in line with the a priori expectation of this study that household size will influence the utilization of the APPEALS Project. The finding contradicts Alabuja *et al.* (2023) who revealed that household size influenced negatively participation in agriculture among women farmers in the Federal Capital Territory Abuja, Nigeria.

Other variables positively significant at 1% influencing utilization include Farming experience, Sex, access to credit, Extension contact and Membership in cooperatives which implies that a unit increase in any of the variables, will lead to a corresponding increase in utilization of the project. This result is similar to the findings of Mukaila, *et al.*, (2021) who discovered that that cooperative membership had a positive and significant effect on rural women income in Enugu State Nigeria.

Table 3: Factors Influencing the Utilization of APPEALS Project among the Beneficiaries

Variable	Coefficient (β)	Standard Error	P-value
Age of the Farmer	0.015***	0.005	0.003
Educational Level	0.050***	0.015	0.001
Farm Size	0.030***	0.010	0.003
Household Size	0.866***	0.311	0.001
Farming Experience	0.530***	0.242	0.012
Sex	0.045**	0.020	0.026
Income	0.00002	0.00001	0.048
Marital Status	0.012	0.004	0.003
Extension Contact	0.025***	0.008	0.002
Access to Credit	0.080***	0.025	0.002
Membership of Assoc	0.060***	0.020	0.003
Constant (β_0)	0.420	0.110	0.000
Log likelihood		-120.234	
Pseudo R^2		0.715	
Prob > χ^2		0.000	
Number of Observations		154	

*** and ** represent significance at 1% and 5%

Source: Field Survey, 2024



Constraints Encountered by the APPEALS Project Rice Farmers Beneficiaries

Result in Table 4 shows that the most constraints for beneficiaries are high costs of production (1st), This finding is similar to the findings of Suleiman *et al.* (2020) who found that high costs of production is one of the major constraints faced by women farmers in accessing credit in Bauchi Metropolis, Nigeria. This was followed by inconsistency in extension contact (2nd), This is in line with findings of Adesiji (2022) who ranked lack of access to adequate extension services as the second among the constraints facing the rice farmers on Utilization of Agricultural Information and Knowledge for Improved Production of rice in Ondo State, Nigeria. Market Price Fluctuations (3rd) was the next pressing constraints which affect the profitability and financial planning of farmers. This result is supported by the findings of Mgale & Yunxian (2021) who ranked low/price fluctuations as the least constraints encountered by the rice farming households in Mbeya region, Tanzania.

Inadequate Credit was ranked 8th among the constraints faced by the beneficiaries. This result confirms the findings of Onuwa *et al.*, (2020) who revealed that complex credit procedure is the major constraint affecting access to credit among farmers in Bokkos Local Government Area of Plateau State, Nigeria. Finally, Untimely Input Delivery (9th) was the last pressing issue in order of constraints faced by the beneficiaries of APPEALS Project. A similar finding was obtained by Oruonye, *et al.*, (2021) who revealed that shortage of farm input was among the major constraints for hindering the implementation of International Funds for Agricultural Development – Value Chain Development (IFAD-VCDP) intervention Programme in Ardo-Kola LGA, Taraba State, Nigeria.

Table 4: Constraints Encountered by the APPEALS Project Beneficiaries (n= 154)

Constraint	Frequency	Percentage (%)	Rank
High Costs of Production	130	84.4	1 st
Inconsistency in Extension Contacts	124	80.5	2 nd
Market Price Fluctuations	119	77.3	3 rd
Pests and diseases	110	71.4	4 th
High transportation costs	95	61.7	5 th
Adulteration of agrochemicals by marketers	80	52.0	6 th
Drought	74	48.1	7 th
Inadequate Credit	68	44.2	8 th
Untimely Input Delivery	61	39.6	9 th

Multiple Responses Allowed*

Source: Field Survey, 2024

CONCLUSION AND RECOMMENDATION

The beneficiaries of the APPEALS Project tremendously utilized the components of the Project very well. The level of the utilization of the project components were influenced by some socio-economic and institutional factors. However, the beneficiaries of the project were constrained by certain hindrance.

Based on the findings of this study, the following recommendations were made:

- Strategies should be developed by Governmental and non-governmental organisations to reduce the impact of market price fluctuations, by strengthening farmer cooperatives and developing partnerships with private companies to ensure stable prices for rice farmers and reduce market risks.
- In all, the project shows significant success, but efforts are required from the project sponsors such as World Bank to ensure equitable utilization across all beneficiary groups through strengthening monitoring and evaluation systems.
- The World Bank in collaboration with the Federal Government and other stakeholders should remove barriers to access to services like farm mechanization and linking farmers to market and providing additional trainings.
- The APPEALS Project implementers and stakeholders should extend the project's benefits beyond its direct participants by expanding the programme to areas that were not covered.



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