



CONSTRAINTS FACED BY RICE FARMERS OF FADAMA III ADDITIONAL FINANCING (AF1) BENEFICIARIES IN ADAMAWA STATE, NIGERIA

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ABSTRACT

The study analyzed the constraints faced by rice farmers of Fadama III additional financing (AF1) beneficiaries in Adamawa State, Nigeria. Specifically, the study described the socio-economic characteristics of the respondents; identified the types of advisory services and input support offered to the respondents; assessed the utilization of advisory services and input support offered to the respondents; determined the factors influencing the utilization of advisory services and input support by the respondents and identified the constraints of the respondents in the study area. Primary data were mainly used, and were collected through the administration of questionnaire to 150 randomly selected rice cluster farmers under Fadama III AF1 in Fufore, Numan and Yola South Local Government Areas. Descriptive statistics, rating scale and regression analysis were used to analyze the data. The result revealed that male rice farmers were the majority (93.2%) with mean age of 49.3 years. Majority (95.2%) of them were married with mean farming experience of 19.7 years and house hold size of 12.1 persons. Majority (68.5%) were literates. Some of the advisory services offered were, market information, improved method of weed control, use of improved varieties, application of appropriate fertilizer, recommended seed rate and mechanical land preparation. Inputs support offered were improved seeds, herbicides, insecticides, fertilizers, power tiller, milling machines and manual rice harvester. The advisory services and input support offered were highly utilized. Age, education, farming experience, off-farm income and farm income were the factors influencing the utilization of advisory services.

Keywords: Constraints, Rice, *Fadama* and Beneficiaries

INTRODUCTION

The Nigerian government, in their effort to reduce the problems inflicted by food insecurity and poverty due to low agricultural production and productivity in the nation established agricultural aid programs. One of such programs is the National Fadama Development Project which was implemented in phases. 'Fadama' is a Hausa name for irrigable land usually low-lying plains underlain by shallow aquifers found along Nigeria's major river system (Project Appraisal Document, PAD 2004). The last phase of the project which is the Fadama III received its Additional Financing (AF) of ₦ 32, 644, 300, 000 billion in June, 2013 and became effective in October, 2013 (World Bank, 2016). The Additional Financing was implemented in selected states on the basis of comparative advantage and high potential to increase production and productivity of Cassava, rice, sorghum and horticulture. Rice is a prominent crop among the wide array of staple crops in the food sub-sector of Nigeria agriculture (Mallam *et al.*, 2014). It is one of the most important healthy food and influences livelihoods and economies of several people (Atande, 2003; International Rice Research Institute (IRRI), 2007-2015). According to a report by United Nations Environmental Programme (UNEP, 2002) in the 1960s, rice was only consumed during festivals and largely in upscale homes at Christmas or other religious festivals. However, Akpokodje *et al.*, (2001) reported that from mid 1970s, there has been a huge climb-up of rice consumption in Nigeria (110.3g per annum). A report by Rice Farmers Association of Nigeria (RIFAN, 2017) and NBS, (2018) showed that rice is now the most consumed staple food in Nigeria, with increased consumption rate of 7.9 million tons in 2017.



Although, rice production in Nigeria has increased from 5.5 million tons in 2015 to 5.9 million tons in 2017, Nigerian rice farmers are still unable to meet the local demand, leaving a supply gap which is bridged by importation (RIFAN, 2017). In order to attain self-sufficiency in rice production, federal government of Nigeria has established many institutions, programs and schemes. One of such major institutions among others is the Fadama III Additional Financing 1 (Fadama III AF1) (World Bank, 2009). The Fadama III AFI which was established by the government in 2013 has an advisory service which empowers the Fadama users through their Local Government Areas to purchase advisory services from public and private sources. These services include provision of advice on the how, when, where and why the use of agro-technology with its associated input market. Inputs support on the other hand, supports, guides and persuade farmers to adopt new technology and more productive practices in their income generating activities to enhance their financial capacity to purchase farm inputs (World Bank, 2016). The Advisory Services and Input Support of Additional Financing provide funds for hiring advisory services to teach techniques on suitable methods of using the factors of production. The bulk of the funds under this component are for the provision of critical inputs (fertilizer, improved seeds and machineries) needed to build up the production of the selected crops (rice, cassava, sorghum and horticulture). The objective of this support is to make sure farmers in the production clusters of the project intervention areas have timely and equal access to these critical inputs in good quality and adequate quantity (Third National Fadama Development Project Additional Financing, 2014). The objective of this research is to Identify the constraints associated with rice farming in the study area.

METHODOLOGY

Study Area

The study was conducted in Adamawa state, Nigeria (latitude 7° and 11° N and longitude 110 and 14° E of the Greenwich meridian). It shares boundary with Taraba State in the South and West, Gombe State in the North-West and Borno State to the North. It also has international boundary with the Cameroon Republic along its eastern border. The State has a land area of 38,741 KM² with an estimated population of 3, 178, 950 people (projected from NPC, 2006). The study area is made up of 21 local Governments area with four Agricultural Development Project (ADP) zones. According to Adebayo (2000) the State's monthly sunshine distribution pattern allows that the period between January to April has a mean sunshine hour of 220 and increases to 225 for the periods between October and December. The temperature and evaporation reach their maximum in April when relative humidity is at its minimum. The State is characterized by mean annual rainfall of less than 1000 in the central and northern parts, while the north-eastern strip and southern part records more than 1000mm annually. The vegetation of the study area falls within northern guinea savannah belt with large swampy (Fadama) areas which support irrigation during dry season. Crops grown in the study area includes rice, maize, sorghum, cowpea, millet, vegetable crops and groundnut (Sajo *et al.*, 1992). The major occupations in the area are agriculture (crop production, fishing and livestock production), trading and civil service.

Method of Data Collection

The primary data were collected through the use of semi structured questionnaire which was administered to the respondents. The questionnaire was in four sections, section A: was for the socio-economic characteristics of the respondents, section B: types of advisory services offered to the rice cluster farmers. Section C: types of input support offered to the rice cluster farmers, section D: Constraints faced by the respondents in the study area.

Sample Size and Sampling Technique

A multi-stage simple random sampling procedure was used in selecting respondents for the study. There were seven Local Government Areas that benefitted from the Fadama III Additional Financing 1 (AF1) in Adamawa State, Nigeria. The rice farmers under the Fadama III AF1 were in clusters of hundreds except Mayo-Belwa who has 60 cluster farmers and Lamurde who has two clusters of 100 farmers each. Three out of seven Local Government Areas were selected using a random sampling technique, these were Fufure, Numan and Yola South Local Government Areas,



which consisted of 300 rice farmers under the Fadama III AF 1 combined, 100 rice farmers in each of the three Local Government Areas. The last stage was the selection of one hundred and fifty respondents using a random sampling technique from the existing sampling frame that the questionnaires were administered to; though only one hundred and forty-six were retrieved and used for the study.

Analytical Techniques

Descriptive statistics were used to analyze the socio-economic characteristics of the respondents (objective I), the type of advisory services and input support offered to rice cluster farmers (objective II), and the constraints faced by the respondents to achieve specific objective III, this involved the use of frequency counts, means, percentages and standard deviations. Rating scale was used to analyze Objective III, which is the utilization of advisory services and input support, they were measured on 4-point scale of High (used by almost all) = 4, Average (used by half) = 3, Low (used by very few) = 2 and not used = 1. This also involved the use of frequency counts, percentages and means. Grand mean = $(4 + 3 + 2 + 1) / 4 = 2.50$.

RESULTS AND DISCUSSION

Socio-economic Characteristics of the Respondents

The socio-economic characteristics of the respondents discussed were sex, age, marital status, household size, farming experience, primary occupation, level of education, off-farm income, farm income, access to credit and membership of other association.

The results in Table 1 showed that most (93.2%) of the beneficiaries of Fadama III AF1 were male while only 6.8% were female. This is in line with the findings of Mustapha *et al.*, (2018) on determinant of yield among rice farmers: of Fadama III AF1 project intervention in Sokoto State, Nigeria; Girei and Dire (2013) in a study on impact of national Fadama II project on the social-economic characteristics of crop farmers in Adamawa State of Nigeria; Abba and Abu (2015) in a study on technical efficiency of small-scale rice production in Adamawa State of Nigeria. This result confirms the dominance of men in crop production activities because farming operations are laborious in nature which requires enormous strength from tillage to harvesting (Asogwa *et al.*, 2014). Male farmers generally constitute the household heads with capacity to represent households in decision making situations, unlike their female counterparts who are constrained by socio-cultural barriers. The results also revealed that 42.5% of the respondents fell within the age range of 40-49 years while 37%, 11%, 7.5% and 3.5% fell within the age 50-59, 60-70, 30-39 and 20-29 years, respectively with mean age of 49.3 years. This is in agreement with Yusuf and Mustapha (2019) in a study on socio-economic characteristics of rice farmers in Sokoto State, Nigeria, also in consonance with Matanmi *et al.*, (2011) in a study on perceived factors limiting rice production in Patigi Local Government Area of Kwara State, Nigeria. Farming activities require labour, the provision of which is determined by age (Jongur, 2006). This result indicates that more than half (52%) of the respondents in the study area were below 50 years of age, therefore they are active and characterized with strength and commitment to farming activities, and are also significantly associated with receiving training on improved agricultural technology and its utilization.

Marital status is a situation with regard to whether one is single, married, separated, divorced, or widowed. Crop production value chain and use of technologies are related to marital status. Hence marriage serves as a means of generating family labour (Antibioko *et al.*, 2012). The findings in Table 1 showed that most (95.2%) of the respondents were married, 1.4% were single, 1.4% divorced and 2% were widowed. This finding is in agreement with Tiku *et al.*, (2010) who revealed in a study on efficiency of inputs Utilization on rice production in Obubra Local Government Area of Cross River State, Nigeria, that 90% of their respondents were married, and also in line with Adeleye (2010) in a study on Adoption of improved rice production technologies among members and non-members of rice farmers association in Kano and Kaduna State, Nigeria, they reported that 93% and 83% of their respondents were married. This finding is also in line with Bawa and Ani (2015) in a study on technical efficiency of small-scale rice production in Adamawa State, Nigeria.



The results from Table 1 also showed that 43.2% of the respondents had household size of between 11-15 while 35%, 16.4% had 6-10 and 16-20 members respectively. The large household size of most of the respondents may be due to polygamy of most farmers. Large household size contributes immensely to family labour supply. This result is in agreement with the study by Igboji *et al.*, (2015) who reported that a high household size is due to the polygamous nature of the farmers. This is also in agreement with Nandi *et al.*, (2012) who noted that household size greater than 6 does well in adoption and utilization of resources for efficient farming.

The results in Table 1 shows the distribution of respondent base on their farming experience. Proper utilization of innovation is favored by enough experience as experience helps farmers to learn from their past mistake Umeh and Ekwengene (2017). The result revealed that majority (55%) of the respondents had farming experience of 11-20 years while 27%, 8% and 2% had 21-30, 1-10 and 31-40 and 41-50 years of farming experience, respectively. This result is in line with the findings by Kagbu *et al.*, (2016) in a study on adoption of recommended rice production practices in Nasarawa State, Nigeria where they reported that majority (80%) of their respondents were highly experienced, and also in agreement with Umeh and Ekwengene (2017) on determinant of Utilization of agricultural extension packages of selected arable crops in Enugu State, Nigeria, who reported that 57.29 % of their respondents were experienced farmers. This result implies that the respondents are well experienced in farming and that will enhance the adoption and utilization of agricultural technology.

The results in Table 1 also presents the distribution of respondents' base on their primary occupation. The results indicate that the majority (77.4%) of the respondents were primarily engaged in crop farming (rice). This trend may be attributed to the fact that the Fadama III Additional Financing (AF1) project was implemented in selected areas with a comparative advantage and high potential for increased rice production and productivity in Adamawa State. A smaller proportion of respondents were civil servants (17.1%) and traders (6%).

Education plays a crucial role in farmers' understanding and adoption of innovations, as it enhances their ability to seek information and utilize new technologies effectively (Ibok *et al.*, 2015). Table 1 shows that 31.5% of the respondents had no formal education, while 26% attained primary education, 24% secondary education, and 18.5% tertiary education. This indicates that the majority (68.5%) of the respondents had some level of formal education. This finding aligns with Igboji *et al.*, (2015), who reported that 70.7% of small-scale rice farmers in Ebonyi State, Nigeria, had at least some education. However, it contrasts with studies by Tsega *et al.*, (2005) and Khattak and Hussein (2008), which found higher illiteracy rates among rice farmers.

The distribution of respondents based on off-farm income is presented in Table 1. The results reveal that 24% earned between ₦210,000–₦300,000 annually, 18% between ₦110,000–₦200,000, and 14% between ₦510,000–₦600,000, while only 5% had no off-farm income. The mean off-farm income was ₦289,000 per annum. This suggests that 95% of the respondents supplemented their farm income with earnings from other sources. Such additional income may enable farmers to invest in agricultural inputs, thereby enhancing the adoption of improved technologies (Alabi *et al.*, 2018). This finding supports Babatunde (2012) and Igboji *et al.*, (2015), who noted that off-farm income positively influences input acquisition and rice production. However, it contradicts Tadesse (2008), who argued that off-farm activities might reduce farmers' time for agricultural engagement, limiting their access to extension information.

The results in Table 1 indicate that 19% of the respondents earned between ₦501,000–₦600,000 annually from farming, 16% between ₦701,000–₦800,000, 15% between ₦401,000–₦500,000, and 12% between ₦201,000–₦300,000. Only 1.4% earned below ₦100,000. This suggests that most farmers had substantial farm income, likely due to the Fadama III AF1 project's focus on high-potential rice-producing areas in Adamawa State.

Table 1 shows that 67% of the respondents had access to credit, while 33% did not. This finding aligns with Sakiru (2013), who reported that 56% of rice farmers in Ogun State, Nigeria, had credit access. Access to credit is expected to facilitate the adoption of improved technologies, enhance productivity, and improve farmers' livelihoods.



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The results in Table 1 reveal that 64.4% of the respondents belonged to other associations besides Fadama III, while 35.6% did not. This is consistent with Ibok *et al.* (2015), who found that 92% of farmers in Cross River State, Nigeria, were members of social groups. Membership in associations can improve access to credit, government subsidies, and agricultural knowledge, all of which are vital for farming success.



Table1: Socio economic Characteristics of Rice Farmers.

Variables	Frequency	Percentage	Mean	Standard
Gender				
Male	136	93.2		
Female	10	6.8		
Age Group (Years)				
20-29	3	2.0		
30-39	11	7.5		
40-49	62	42.5	49.3	49.9
50-59	54	37.0		
60-70	16	11.0		
Marital Status				
Single	2	1.4		
Married	139	95.2		
Widowed	3	2.0		
Divorced	2	1.4		
Household Size				
1-5	4	2.7		
6-10	51	35.0		
11-15	63	43.2	12.1	12.7
16-20	24	16.4		
21-30	4	2.7		
Years of Experience				
1-10	12	8.0		
11-20	80	55.0		
21-30	39	27.0		
31-40	12	8.0		
41-50	3	2.0		
Primary Occupation				
Farming	113	77.4		
Trading	6	4.1		
Civil Servant	25	17.1		
Fishing	1	0.7		
Hunting	1	0.7		
Level of Education				
No formal education	46	31.5		
Primary Education	38	26.0		
Secondary Education	35	24.0		
Tertiary	27	18.5		
Off-Farm Income (‘000)				
10-100	21	14.0		
101-200	35	18.0		
201-300	19	24.0		
301-400	14	13.0		
401-500	13	9.0	289	353.4
501-600	5	3.0		
601-700	3	2.0		
701-800	2	1.4		
801-900	1	0.6		
901-1000	7	5.0		
Farm Income (‘000)				
10-100	2	1.4		
101-200	10	7.0		
201-300	18	12.0		
301-400	16	11.0		
401-500	22	15.0		
501-600	28	19.0	504	486.8



601-700	20	14.0
701-800	24	16.0
801-900	3	2.0
901-1000	2	2.0
1001-1100	1	0.6
Access to Credit		
Yes	98	67.0
No	48	33.0
Membership of other Association		
Yes	94	64.4
No	52	35.6

Source: Field Survey, 2021

Types of Advisory Services Offered to Rice Cluster Farmers.

All (100%) of the respondents were offered advisory services on appropriate planting date, recommended seed rate, improved method of weed control, application of appropriate fertilizer, and method of fertilizer application. The results also revealed that almost all (99.3% and 98.6%) of the respondents received training on mechanical land preparation and use of improved varieties respectively. The results further revealed that most (93.2% and 91.8%) of the respondents were provided with market information and pest and disease management practices. In addition, majority (87.7% and 83.6%) received advisory services on appropriate spacing and post-harvest handling techniques. However, fewer respondents were offered advisory services on linkage to market (52.7%), storage methods (47.3%), harvesting technique (38.4%), use of mechanical winnower (18.5%), and improved processing (16.4%). This result implies that the cluster farmers in Adamawa State were actually offered comprehensive advisory services by the Fadama III Additional Financing 1 project, though with varying degrees of coverage across different aspects of rice production. This finding is consistent with Umar *et al.*, (2012) who found that Fadama II farmers received advisory services particularly in post-harvest handling, agricultural marketing and crop management practices. It also aligns with Obidike (2011) who reported that farmers were provided information on new methods of crop preservation, introduction of new herbicides and pesticides, crop disease treatment and control, better crop rotation practices and fertilizer application

Table 2: Types of Advisory Services Offered to Rice Cluster Farmers

Advisory Services	Frequency	Percentage
Appropriate Planting Date	146	100.0
Recommended Seed Rate	146	100.0
Improved Method of Weed Control	146	100.0
Application of Appropriate Fertilizer	146	100.0
Method of Fertilizer Application	146	100.0
Mechanical Land Preparation	145	99.3
Use of Improved Variety	144	98.6
Market Information	136	93.2
Pest and Disease Management Practice	134	91.8
Appropriate Spacing	128	87.7
Post-harvest handling	122	83.6
Linkage to Market	77	52.7
Storage Methods	69	47.3
Harvesting Technique	56	38.4
Improved Processing	24	16.4
Use of Mechanical Winnower	27	18.5

Source: Field Survey, 2021



Types of Input Support Offered to Rice Cluster Farmers.

The results in Table 3 reveal that all (100%) of the rice cluster farmers received fertilizers and milling machines as input support from Fadama III Additional Financing 1 in Adamawa State. The results also show that nearly all beneficiaries were provided with herbicides (98.6%) and improved seeds (97.3%), while most received insecticides (90.4%) and pesticides (86.9%).

The input distribution further indicated that about half (49%) of the farmers benefited from manual rice harvesters, while fewer received tractorization/power tillers (45.9%) and generators (25.3%). It should be noted that some inputs like power tillers and milling machines were not distributed uniformly across all study areas, as they represented additional support specifically targeted at youth and women who were not initial beneficiaries of the input support program.

This pattern of input distribution demonstrates that while essential production inputs like fertilizers, improved seeds, and crop protection chemicals were widely provided to nearly all farmers, mechanization equipment and post-harvest technologies had more limited coverage. Beneficiaries were required to provide a 50% matching grant for all inputs received, which may have influenced the adoption rates of more expensive equipment.

These findings align with Mahadeva's (2014) study on agricultural input subsidies in Karnataka, India, which similarly reported that farmers received improved seeds, agricultural implements, plant protection chemicals, fertilizers, and sowing equipment. The comprehensive input support provided through Fadama III Additional Financing 1 confirms the project's commitment to enhancing rice production in Adamawa State, though with varying degrees of accessibility across different input categories.

The differential distribution of inputs, particularly the targeted provision of certain equipment to specific beneficiary groups (youth and women), suggests a strategic approach to input support that considers both production needs and social inclusion objectives within the farming communities.

Table 3: Types of Input Support Offered to the Rice Cluster Farmers

INPUTS	Frequency	Percentage
Fertilizers	146	100
Milling Machine	98	100
Herbicides	144	98.6
Improved Seed	142	97.3
Insecticides	132	90.4
Pesticides	127	86.9
Manual Rice Harvester	24	49
Tractorization/Power Tiller	67	45.9
Generators	37	25.3

Source: Field Survey, 2021

Constraints Associated with Rice Farming in the Study Area

The constraints experienced by the respondents in the study area are presented in table 4.16. The result revealed that the major constraints were flooding (94%), Drought (92%), Lack of threshing machine (91%), delayed access to tractor (90%), Low price of Paddy (89%), poor transportation network (82%), delayed access to market (81%), fluctuation in climate (79%), untimely supply of inputs (68%), pest and disease infestation (55%), inadequate storage facilities (45%) and Lack of access to credit (41%). This result agrees with the findings by Omofonmwan and Kadiri (2007) who also found that rice production is bedeviled by pest and diseases. It is also in agreement with Matanmi *et al.*, (2011) who pointed out the limiting factors in rice production as poor access to input, pest and disease, poor transportation, fluctuation in climate, lack of extension services and lack of storage facilities. This result further confirms that Fadama III AF1 was implemented in areas with high comparative advantage of increase production and productivity of rice, because despite these constraints, the respondents still have high farm income.



Table 4: Constraints Associated with Rice Farming

Constraints	Frequency*	Percentage
Flood	137	94
Drought	134	92
Lack of Threshing Machine	133	91
Delayed Access to Tractor	131	90
Low Price of Paddy	130	89
Poor Transportation/feeder roads	120	82
Delayed Access to Market	119	81
Fluctuation in Climate	116	79
Untimely Supply of Inputs	100	68
Pest and Disease	80	55
Inadequate Storage Facility	66	45
Lack of Access to Credit	60	41
Difficulty in Paying Matching Grant	50	34
Lack of Standard Measure	50	34
Poor Milling Machine	20	14

* Multiple Responses

CONCLUSION AND RECOMMENDATION

The study concluded that the major constraints faced by the Fadama AFI in the study area were drought, inadequate machineries for threshing, low price of paddy rice and poor road network. The beneficiaries were offered varieties of advisory services in different agronomic practices and various inputs were offered to them to support rice production by the project. Based on the findings of this study, the following recommendations were made:

- Government should construct new feeder roads and or rehabilitate the existing damaged roads to open up the rural areas, this will ease the transportation problems of the farmers by facilitating their access to market and also reduce the cost of transporting farm inputs, and their farm produce to markets
- There should be the development of an efficient distribution network for inputs (supply and delivery system). These inputs should be made readily available at the appropriate time for both rainy and dry season farming.
- Farmers should be trained on easy identification, prevention and control of pests and disease. Insecticides and other chemicals used in the control of pests and diseases should be supplied at subsidized rates.
- To reduce flood risks, agencies should ensure proper land-use planning, maintain flood infrastructure like dams and canals, and implement financial tools such as weather-index insurance for smallholder farmers and subsidized crop coverage schemes, like Nigeria's agricultural insurance program, to mitigate losses from extreme weather.

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