ASSESSMENT OF THE RATE OF ADOPTION OF IMPROVED CROP TECHNOLOGY IN THE FADAMA III PROJECT IN BAYELSA STATE, NIGERIA

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ABSTRACT

The Fadama III project was aimed at increasing the output and income of farmers sustainably. This could be achieved by the use of improved crop technologies. These improved crop technologies will aid in the increase in farming production which is believed to bridge the gap between the demand for food and its supply. Hence the study assessed the rate of crop technology adoption by Fadama III users in Bayelsa state, Nigeria. Specifically, the study identified the types of improved crop varieties adopted by farmers and determined the adoption rate of the improved crop technology by farmers' age. Multistage sampling technique was used to select a sample of 138 respondents. Data collection was done using the questionnaire method and data was analyzed using descriptive statistics. The results showed that majority of the respondents were male (54.3%) between the ages 36-50 years (66.7%) and an average of 4 years of experience with Fadama III. Results also showed that plantain and cassava were the most improved crop varieties adopted by farmers. Use of fertilizer and adequate crop spacing were adopted mostly farmer between age group of 36-50 years. Therefore, the study concludes that the rate of adoption to improved crop technologies in Fadama III were relatively moderate and thus it was recommended that advisory services of the Fadama III project should further be strengthened in order to increase the rate of adoption of improved crop technologies in Bayelsa state.

Keywords: Fadama III, Adoption, crop technology

INTRODUCTION

Agriculture is the mainstay of the Nigerian economy with more than forty percent contribution to the country's Gross Domestic Product (GDP). However, food production in the country is still not sufficient for residents thereby creating a huge difference between foods demanded and food produced (Abada, Ezeibe, & Nnwanze, 2016). In order to bridge this gap, the Federal Government of Nigeria (FGN) has taken various steps to ensure that the farming community through the improvement of agriculture and agricultural technologies can be empowered through relevant policies, programs, projects and even financial aids. One of such programs was the FADAMA III project directed and implemented in all 36 states (Bayelsa state inclusive) of the country on a US$450 million budget (Abada, Ezeibe, & Nnwanze, 2016). With the huge investment in the project, a huge success is therefore anticipated. Hence, the adoption rate to crop technologies will be assessed. This is against the backdrop of this study.

The Fadama III project is channeled to the improvement of the living standard of farmers and to a great extent alleviates poverty (Esu & Adesope, 2012; Ike, 2012). The FADAMA III is a participatory program aimed at the increase of the output and income of Fadama users sustainably(Abada, Ezeibe, & Nnwanze, 2016). Fadama users includes crop farmers, livestock producers, fish farmers and agroforesters. However, this study focuses on the crop farmers and crop technologies. Farming technologies has become apparently important factor to consider given to the issues of land degradation. Agricultural lands have experienced large degradation in quality due to production expansion via area expansion at the expense of intensive farming. Other factors in the low and declining productivity of the Nigerian agricultural sector include poorly developed irrigation potential, inadequate and poorly funded and maintained production infrastructure, poorly funded agricultural research and extension systems, inadequate availability and distribution of key inputs (fertilizers, chemicals, machinery and improved seed), poor land management practices, poor access to livestock inputs and veterinary services, poor or lack of access to financial services for the procurement of needed inputs and services (processing, storage, transportation, etc.). Yet, the Nigerian rural farmers who are mostly uneducated or illiterates, constitutes the main source of food supply in the country (Idike, 2008).

Arising from the foregoing constraints to increasing the Nigerian agricultural productivity, a number of strategic choices were built into the design of Fadama III project. These choices were made to (a) address the productive infrastructure constraints, (b) improve livelihood opportunities, (c) empower the rural poor, (d) promote socially-inclusive and community-based approaches and (e)accord adequate attention to technical quality assurance. In addition, Fadama III was recognized as a vehicle to drive the current Government effort at transforming the Nigerian Agriculture (Agricultural Transformation Agenda). All these efforts if not anchored on the adoption of productivity enhancing technologies may not necessarily take Nigerian Agriculture to the desired destinations. Idike, (2008) reiterated that what Nigeria needs is the adoption of practical workable and affordable agricultural technologies for the rural farming population to enhance increased productivity. Thus the important of adopting to these crop technologies cannot be overlooked.

Therefore the broad objective of this study was to assess the rate of crop technology adoption by Fadama III beneficiaries/users in Bayelsa state, Nigeria. The specific objectives of the study are to identify the types of improved crop varieties (food and cash) adopted by farmers in the study area, determine the adoption rate of the improved crop technology by farmers age in the study area and to further identify improved agro-processing technology adopted by farmers. The study will aid in the attainment of how successful the project was in improving farmers' use in crop technologies which could result in an increase in farmers output and income.

METHODOLOGY

The study was carried out in Bayelsa State of Nigeria. Bayelsa State is one of the 9 Niger Delta States (Azaiki,2003). The State is a Fadama III in non-Fadama II state. The study covered the 8 local government areas of Bayelsa State. Multistage sampling techniques was employed and a total of 138 Fadama households were sampled.This number cut across 38 Fadama Community Associations (FCAs) and 570 Fadama Users Groups (FUGs) that received advisory services and input support from FADAMA III. Structured questionnaire was used as data collection instrument. Data was analysed using descriptive statistical as frequency, percentage and mean.

RESULTS AND DISCUSSION

The study result is presented. The socioeconomic characteristics of farmers is presented in Table 1, types of improved crop varieties adopted is presented in Table 2, the adoption rate of improved crop technology by age category is Table 3 and Table 4 shows the improved agro-processing technology adopted.

Table 1: Socio-economic characteristics of respondents (n=138)

A. Age	**Frequency**	**Percentage**	**Mean**
26-35 years	33	23.9	42 years
36-50 years	92	66.7	
51-60 years	13	9.4	
B. Gender			
Male	75	54.3	
Female	63	45.7	
C. Farm size			
1 – 3 ha	124	89.9	2.2ha
4 – 7 ha	14	10.1	
D. Marital status			
Single	6	4.3	
Married	123	89.1	
Widowed	3	2.2	
Separated	6	4.3	
E. Farm income per annum			
Less than N5, 000, 000	129	93.5	
N5, 000, 000 – N20, 000, 000	8	5.8	₦1,347,210.79
Above N20, 000, 000	1	0.73	
F. Experience in farming			
Less than 10 years	71	51.4	
10 – 20 years	48	34.8	17years
21 – 30 years	18	13.0	
31 – 40 years	1	0.7	
G. Experience with Fadama III			
1 – 3 years	43	31.2	
4 – 5 years	95	68.8	4years
H. Educational			
No formal education	5	3.6	
Primary	21	15.2	
Secondary	82	59.4	
Tertiary	30	21.7	
I. How did you know about Fadama III			
Voluntary	110	79.7	
By appointment of comm. Leadership	5	3.6	
By persuasion of friends	11	8.0	

By persuasion of Fadama III officials	12	8.7	
J. Has your yield increased			
Yes	130	94.2	
No	8	5.8	

Source: Field survey data, 2013

Table 1 showed that majority of the respondents (66.7%) were between 36 and 50 years with average age of 42 years. Also, 54.3% were males suggesting male dominance in the project. This was inline with Ike (2012) as majority of Fadama III users in Delta state were male. It was found that most of the respondents (89.9%) had farm size of between 1 and 3ha with average of 2.2 hectares indicating that they are small scale farmers. The findings showed that majority of the respondents are married (89.1%) and this was also in-line with Ike (2012). The average annual farm income estimated was ₦1,347,201.79. The study showed that most of the respondents (51.4%) had farming experience of less than 10 years and average experience in farming was 17 years indicating reasonable farming experience. It was found that most of the respondents (68.8%) have between 4 and 5years' experience involvement with Fadama, with an average of 4 years experience. Respondents were generally educated, with most (59.4%) having secondary education. Majority of the respondents (79.7%) indicated that they voluntarily joined the Fadama group and most (94.2%) indicated that their yields have increased as a result of adopting new technologies of Fadama III project.

Table 2: Types of improved crop varieties (food and cash) adopted by farmers in the study area

	25 – 35 years	**36 – 50 years**	**51 – 60 years**
Types of Improved Crop Varieties	**n =33**	**n = 92**	**n = 13**
1. Plantain	10(30.3)	39(40.2)	6(46.2)
2. Cassava	14 (42.4)	37(40.2)	5(38.5)
3. Yam	2 (6.1)	8 (8.7)	0 (0)
4. Swamp rice	0 (0)	2 (2.2)	3 (23.1)
5. Upland rice	0 (0)	0 (0)	1 (7.7)
6. Vegetables	2 (6.1)	7 (7.6)	3 (23.1)
7. Cocoyam	2 (6.1)	6 (6.5)	0 (0)
8. Maize	2 (6.1)	10 (10.9)	1 (7.7)
9. Oil palm	0 (0)	2 (2.2)	0 (0)
10. Rubber	0 (0)	2 (2.2)	0 (0)
11. Cocoa	0 (0)	3 (3.3)	0 (0)
12. Banana	1 (3.0)	12 (13.0)	1 (7.7)
13. Kola	0 (0)	2 (2.2)	0 (0)

Source: Field survey data, 2013
Values in parenthesis are percentages

From Table 2, the age group of 51 - 60 years recorded the highest percentage (46.2%) of plantain as improved food crop variety while the age grade of 36 – 50 years and 25–35 years recorded (40.2%) and (30.3%) respectively of plantain as improved variety of food adopted by farmers

across. Furthermore, age grade of 25 – 35 and 36-50years recorded as much as (42.4%) and (40.2%) respectively of cassava as improved food crop variety while (38.5%) of the age grade of 51- 60 years adopted cassava as improved food crop variety. Following cassava is the swamp rice and vegetable whereby 23.1% of the age grade of 51-60 years recorded swamp rice and vegetable respectively as the improved food crop variety. The age grade of 36-50 years recorded more percentage of 2.2%, 2.2%,3.3%,and 2.2% for cash crops oil palm, Rubber, cocoa, and kola respectively as the improved cash crop variety.The findings revealed that respondents adopted mainly two improved crop varieties which include plantain and cassava whose adoption rates were moderate (40.2 – 46.2%).

Table 3: Adoption rate of improved crop technology in the study area by age category

Improved Crop Technologies	**20 – 30 years**	**36 – 50 years**	**51 – 60 years**	**Total**
Adequate crop spacing	12 (36)	38 (41.3)	6 (46.2)	56 (40.6)
Optimum plant population	13 (39.4)	38 (41.3)	3 (23.1)	54 (39.1)
Seed dressing	9 (27.3)	9 (9.8)	6 (46.2)	24 (17.4)
Use of herbicides	13 (39.4)	26 (28.3)	6 (46.2)	45 (32.6)
Use of fertilizers	14 (42.4)	42 (45.7)	8 (61.5)	64 (46.4)
Use of insecticides	12 (36.4)	24 (26.1)	5 (38.5)	41 (29.7)
Regular weeding	10 (30.3)	34 (37.0)	8 (61.5)	52 (37.7)
Adequate disease control measures	9 (27.3)	31 (33.7)	7 (53.8)	47 (34.1)
Timeliness of planting	9 (27.3)	31 (33.7)	5 (38.5)	45 (32.6)
Yam minisett technology	4 (12.1)	3 (3.3)	1 (7.7)	8 (5.8)
Sole improved cassava varieties	6 (18.2)	17 (18.5)	3 (23.1)	26 (18.8)
Dry season vegetables	6 18.2)	7 (7.6)	2 (15.4)	15 (10.9)
Use of improved seeds/seedlings	7 (21.2)	15 (16.3)	4 (30.8)	26 (18.8)
Seed selection in rice	2 (6.1)	2 (2.2)	3 (23.1)	7 (5.1)
Planting depth	3 (9.1)	23 (25.0)	4 (30.8)	30 (21.7)
Pest control using chemicals	4 (12.1)	20 (21.7)	6 (46.2)	30 (21.7)
Land preparation	6 (18.2)	31 (33.7)	4 (30.8)	41 (29.7)
Table well for rice production	2 (6.1)	1 (1.1)	3 (23.1)	6 (4.4)
Modern storage system	2 (6.1)	7 (7.6)	5 (38.5)	14 (10.2)
Water management	0 (0)	9 (9.8)	5 (38.5)	14 (10.2)
Irrigation system	0 (0)	0 (0)	1 (7.7)	1 (0.7)
Improved upland rice	0 (0)	0 (0)	3 (23.1)	3 (2.2)
Improved swamp rice	0 (0)	0 (0)	2 (15.4)	2 (1.5)
Cassava/maize/swamp rice/vegetable production	0 (0)	2 (2.2)	3 (23.1)	5 (3.6)
Cassava/maize/vegetable production	3 (9.1)	13 (14.1)	3 (23.1)	19 (13.8)
Crop protection (Integrated Pest management)	0 (0)	5 (5.4)	5 (38.5)	10 (7.3)

Mixed cropping	7 (21.2)	14 (15.2)	3 (23.1)	24 (17.4)
Crop rotation	1(6.1)	8(8.7)	4(30.8)	13 (9.4)

Source: Field survey data, 2013

From Table 3, 61.5% of farmers of age grade 51-60 recorded fertilizer as use of improved crop technology while 45.7% and 42.4% of the age grades 36-50 and 20-30 respectively recorded use of fertilizers as the improved crop technology. Also, 61.5% of the age grade 51-60 recorded regular weeding as the improved crop technology while the age grades 36-50 and 20-30 recorded 37.0% and 30.3% of regular weeding as the improved crop technology. Then, 53.8% of ages 51-60 recorded adequate disease control measures as the improved crop technology. Ages 36-50 and 20-30 recorded 33.7% and 27.3% of adequate disease control as measures to be the improved crop technology. While 46.2% of adequate crop spacing was recorded by the age range of 51-60 to be the improved crop technology and their counterparts in the age ranges of 36-50 and 20-30 recorded 41.3% and 36% respectively for adequate crop spacing as the improved crop technology.

Furthermore, 46.2% was recorded for seed dressing and use of herbicides respectively as the improved crop technology by ages above 50. While age 36-50 recorded 28.3% for use of herbicides as crop technology but age range of 20-30 recorded 27.3% and 39.4% for seed dressing and use of herbicides to be the improved crop technology.Then, 38.5% of ages above 50 recorded timeliness of planting as improved crop technology. While 33.7% and 27.3% of ages 36 - 50 and 20 - 30 respectively recorded timeliness of planting as the improved crop technology. Ages above 50 recorded 23.1% of mixed cropping as improved crop technology which is greater than 21.2% recorded by their counterpart in age 20 - 30. In general for all age groups, the use of fertilizers (46.4), adequate crop spacing (40.6) and optimum plant population (39.1) recorded the highest number of adoption rate compared to other technologies.

Table 4: Improved agro processing technologies adopted by farmers in the study area

Improved Agro-processing Technologies Adopted	**Frequency**	**Percentage**
Garri processing	6	4.4
Palm fruit processing	28	20.3
Cassava processing	9	6.5
Fruit juice processing	32	23.2
Rice milling	4	2.9
Plantain processing into chips	3	2.2

Source: Field survey data, 2013

From Table 4, 23.2% farmers recorded fruit juice processing as improved agro processing technology while 20.3% farmers recorded palm fruit processing to be the improved agro processing technologies adopted by farmers. This implied that few improved agro processing technologies were adopted.

CONCLUSION

The study concludes that the rate of adoption to improved technologies in Fadama III was relatively moderate with mostly male farmers. Plantain and cassava were the most adopted crop varieties by farmers. The most adopted improved crop technologies were the use of fertilizers, adequate crop spacing and optimum plant population. Amongst the age groups, farmers under the ages of 36-50 years had a higher rate of adoption of improved crop technologies than other age groups. Also, fruit processing and palm fruits processing technologies were most adopted. Recommendation is thus made on the improvement of the rate at which farmers adopt to improve crop technologies through strengthen of advisory services of the Fadama III project.

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