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EVALUATION OF THE EFFECT OF FADAMA I ON POVERTY ALLEVIATION AMONG SMALL SCALE FARMERS IN EDO STATE, NIGERIA

[1]Olumese M.I.[1], [2]Omoregbee, F.E. and [3]Onemolease, E.A.
[1]Edo State Agricultural Development Programme (EDO ADP) PMB 1698, Benin City, Nigeria
[2]Dept of Agricultural Economics and Extension Services, University of Benin, Benin City, Edo State, Nigeria
[3]Dept. of Agricultural Economics and Extension Services, Abrose Alli University, Ekpoma, Edo State, Nigeria

ABSTRACT

The study evaluated the effect of Fadama I on poverty alleviation among small scale farmers in Edo State. Specifically, the study assessed respondents' awareness and adoption of Fadama I technologies, compared the income level of Fadama I participants and non-fadama participants, compared between the poverty status of both respondents and examined the constraints that affected respondents of Fadama I in Edo State. Data were collected by means of pre-tested questionnaire from 264 randomly selected respondents made up of 132 Fadama I participants and 132 non-fadama participants chosen from four local government areas from three (3) senatorial districts – Edo South, Edo Central and Edo North Zones respectively. Data were analyzed using descriptive statistics such as frequency counts, means, standard deviation and percentages. The relationship between the dependent and independent variables of the study were tested using t-test, logit regression and chi-square analyses. Results should that 65% of the respondents were males while 35 % were females. The mean age was 30 years, the mean family size was 6 persons per household. The mean farm size was 1 hectare while the mean farming experience was 12 years. Results also indicated that the net farm income realized by fadama participants was N232,081.08 while the net farm income of non-fadama participants was N190,621.51 per annum. There was a significant difference at $P \leq 0.05$ *level based on t-test analysis (t= 1.349, P = 0.179). The logit regression analysis revealed that there was a significant relationship between age (b = 0.143), gender (b = 0.162), involvement in Fadama farming (b = -4.318) and poverty status of respondents. Generally, respondents' awareness of Fadama I technologies was high (84.4%) while adoption was love (42%). The most serious of all the constraints identified was inadequate credit among respondents (mean = 4.5%, S.D = 0.5). the findings equally showed that 72.7% of Fadama I participants was non-poor while 44.7% of non-fadama participants were non-poor, implying living above poverty line with N113,760.67 identified as the established poverty line for this study. The result also indicated that 1.25km Fadama road was constructed at Ogba Village, 1.366km Anegbette. In addition, 41 Fadama user associations (FUAs) were registered with Edo State Government under fadama I scheme. It was recommended for the need for Edo State ADP to link Fadama farmers with credit institutions (formal and informal) in order to enhance respondents' access to available credits.*

Keywords: Evaluation, Effect, Fadama I, Poverty Alleviation, Fadama User Associations, Edo State

INTRODUCTION

Fadama is a Hausa name for irrigable land which are flood plains and low lying plains underlined by shallow aquifer found along Nigeria's river system. The basic phenomenon is the ease of accessibility of shallow ground water and or surface water for agricultural production (Edo ADP, 2003). Fadama I project started in Edo State ADP embarked on the National Fadama Development Programme Phase I (Fadama I) in 1996 with the objective to increase dry season crop production, increase farmer's income thereby alleviating poverty and hunger. The National Fadama Development Project I (NFDPI) was approved for funding in March 26, 1992 for a loan of US$ 67.5 million. NFDP-I was the pilot phase of the Fadama project. It was to build on the achievement of some of Northern Nigeria ADPs in developing small-scale irrigation through extraction of shallow ground water using low-cost petrol driven pumps. It was intended to raise farmer's income and contribute to food security and poverty alleviation.

Correspondence Author: Olumese, M.I. E-mail: olumesedu@gmail.com

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The objectives of NFDP-1 were.

1. To assist the federal Government to construct 50,000 tube wells in the Fadama lands for small scale irrigation
2. To simplify drilling technology for the tube wells.
3. To construct Fadama infrastructure such as tube wells, wash bores, access roads etc.
4. To organize farmers for irrigation services
5. To carry out aquifer studies
6. To complete an environmental assessment of the environment and social impact of future Fadama development. Self sufficiency in food production based on rained agriculture is difficult to achieve. This is particularly true in Nigeria. For self sufficiency in food production, there is need to extend the farming season beyond the rainy seasons through irrigated agriculture (Anambra State Agricultural Development ASADEP, 2000). NFDP-1 was negotiated with the World Bank in 1992. It covered seven (7) core states in the country namely, Bauchi, Gombe, Kano, Jigawa, Kebbi, Sokoto and Zamfara.

According to Ogwumike (1988) evidences in Nigeria showed that the number of those in poverty has continued to increase. For example, the number in poverty increased form 27% in 1980 to 46% in 1985, it declined slightly to 42% in 1992 and increased very sharply to 667% in 1996. By 1999, estimates had it that more than 70% of Nigeria live in absolute poverty.

According to Obadan (2002), a number of federal Government initiatives such as Family Economic Advancement Programme (FEAP), National Poverty Eradication Programme (NAPEP), Youth Empowerment Scheme (YES), Rural Infrastructural Development Scheme (RIDS), Social Welfare Service Scheme (SOWESS), National Resources Development and Conservation Scheme (NRDCS) were related programmes put in place to address poverty in Nigeria.

Despite the objective of the Fadama I project to reduce poverty through group effort by creating the Fadama users associations (FUAs) in the phase I and Fadama Community Association (FCA) in the phase II of NFDP as well as boost food production, encourage rural food insecurity, the fight against poverty have not yielded the desired results as farmers continued to generate low income.

The prevalence of poverty has continued to be a recurring decimal in Nigeria, hence the recent effort by the World Bank and the Federal Government of Nigeria to embark on the Fadama III project nationally.

Although Edo State ADP did not participate in Fadama phase II project, unlike some other ADPs in Nigeria, Fadama III is on-going, and it is on record that Edo ADP fully participated on a pilot scheme in the planning, design and implementation stages of Fadama phase I project which ended in 1998. If an assessment of the effect of Fadama I on poverty alleviation is to be studied, the following research questions are imperative for such as evaluation to be meaningful.

Research Questions

i. What are the socio-economic characteristics of Fadama I farmers and non-fadama in Edo State?
ii. To what extent have farmers in Edo State been aware of and adopted the Fadama I technologies disseminated by Edo ADP extension agents?
iii. To what extent have Fadama I project alleviated poverty among farmers in Edo State?
iv. What were the constraints that affected the respondents of Fadama I in Edo State?

This study is therefore undertaken to evaluate the effect of Fadama I on poverty alleviation among small-scale farmers in Edo State. Specifically, the study aimed to:

1. examine the socio-economic characteristics of fadama I participants and non-fadama participants in Edo State,
2. determine the level of income between Fadama I farmers and non-fadama farmers in Edo State.
3. determine the respondents awareness and adoption of Fadama I technologies in Edo State.
4. compare the poverty status between Fadama I farmers and non-fadama farmers as well as
5. identify the constraints that affected respondents of Fadama I in Edo State.

HYPOTHESES OF THE STUDY

1. There is no significant difference in the level of income of Edo ADP Fadama I participants and non-fadama participants.
2. There is no significant relationship between socio-economic characteristics of respondents and their poverty status.

RESEARCH METHODOLOGY

This study was carried out in Edo State. Edo State is one of the six (6) states in the South-South geopolitical zone of Nigeria namely, Akwa-Ibom, Rivers, Cros River, Delta Edo and Bayelsa. Edo State was created out of the defunct Bendel State on 27th August, 1991 with the state capital at Benin City. The state covers a total area of about 19,035 square kilometers with 180,000 farm families.

For effective extension coverage, ESADP is divided into three agricultural zones as follows. Edo South, Edo Central and Edo North zone. The study focused on Edo ADP Fadama I participants and non-fadama participants. Data were collected with the aid of a well-structured questionnaire and a multi-stages sampling technique was employed in randomly selection of 264 respondents used as my sample size for this study.

For statewide coverage, a comprehensive list of 41 Fadama users associations registered with Edo State government under Fadama I was consulted after liaising with the former ADP programme manager. Out of which the researcher selected 9 Fadama community associations (FCAS) randomly across 4 local government areas. In each of the 9 Blocks, 15 Fadama participants were selected from each of the 4 Local Government Areas in Edo State.

For a comparative purpose, a control group (15 non-Fadama participants) were selected from each of the 9 blocks representing 9 communities where Edo ADP carried out Fadama I project in Edo State.

The 9 FUAs selected for this study include:

Oredo Local Government Area (Edo South)

1. EgbedeFua in Ogba Village in Oredo
2. OtezeFua in Ogbeson Community in Ikpoba-Okha Local Government Area

} South Zone

3. Nana Fua in Illush
4. OtomajeFua
5. IbajiFua

} Central Zone

6. AnegbetteFua
7. Ukpeko-OrleFua
8. EkperiFua
9. AgbedeFua – these 4 fuas are in Etsako-East LGA)

} North Zone

On the whole, the researcher used a total of 132 fadama farmers and 132 non-fadama farmers for this research.

MEASUREMENT OF VARIABLES

Independent variables of this study included the socio-economic characteristics of Fadama I respondents and non-Fadama respondents which are namely: Age: Their age was measured in years. Marital status was determined by asking the respondents to indicate whether married, single, divorced, separated or widowed. Their educational attainment was determined by asking respondents to indicate the category they belonged: no formal education, did not complete primary school, completed primary school education, did not complete secondary school education, completed secondary school education, did not complete tertiary school education, completed tertiary school education.

Farm size was measured by the total area the respondents cultivated in hectares. Farming experience of respondents was measured in years.

Membership of Fua was measured by asking the respondents to indicate whether they belong to Fadama user association (Fuas) or not. Those who were Fua members were coded 1, while non-members of Fua were coded 0.

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Access to Tubewells/washbores/waterpumps. Respondents who had access to Fadama infrastructure were Access to Extension services. Respondents with contact with EAs were coded I while lack of access to EAs were coded 0.

Dependent variable: For this study, the dependent variable was poverty status of farmers. Income was used as a proxy for measuring poverty. The poverty characteristics of respondents (fadama I farmers and non fadama farmers). That is, poverty incidence was measured using the FGT model as shown below.

Poverty Incidence

$$P = 1q = \frac{H}{N}$$

Where P = poverty incidence

H = Is the head count ratio or poverty incidence

To make decision on the poverty status of the respondents, the researcher decided to consider the relative poverty line model, which was first determined by equating it to 2/3 of the mean farm income of respondents and used by FOS (1999), World Bank/FOS/NPC 1998 and Adeyeye (2001). This was used to classify the respondents under study into three groups.

1. Non-Poor (NP): These were respondents whose income fell above 2/3 of the poverty line i.e. NP > 2/3 (Mean income).
2. Extremely Poor (EP): These were respondents whose income fell between 1/3 < MP 2/3 (mean income).
3. Extremely Poor (EP): These were respondents. Those whose farm income fell below 1/3 of the poverty line i.e. EP < 1/3 (mean income0

Data were analyzed using descriptive statistics such as Frequency counts, means, percentages and standard deviation.

T-test was used to test hypothesis 1 of the study while logit regression and chi-square was used to test hypothesis 2 of this study. For example, objective 5: to identify the constraints that affected respondents of Fadama 1 in Edo State was measured using a likert-type scale. A 4 – point likert-scale ranging from "most serious" (4) "undercided" (3) "serious" (2) "Not serious" (1) was used to identify constraints that affected the respondents. A mean score of ≥ 2.50 indicates the most serious of all the constraints which was credits while a mean score lower than 2.50 indicates not too serious of the constraints.

RESULT AND DISCUSSION

Socio-economic characteristics of Respondents

The socio-economic characteristics of respondents are presented in Table 3.1. About one-third (32.2%) of the respondent were in the age group of between 31 and 40 years and the remaining 64.8% of them belonged to different age groups of >20 years (9.8%), 21 – 30 years (24.6%), 40 – 50 years (17.0%), 50 years and above (13.3%) respective.

As shown in Table 3.1, 65% of the respondents were male while 35.5% were females. In addition, 61.4% were married while 33.7% were single. About 34.8% had no formal education, 31.8% did not complete primary school education, 21.2% completed primary school education, 5.3% did not complete secondary school while l7.2% completed secondary school education. The mean farming experience of respondents was 12 years. The mean farm size was I hectare majority of the respondents had between 0.6 – 1.0 hectare (62.9%) as their farm size. This means that the Fadama farmers were largely small scale farmers who cultivated their farm lands with Hoes and Cutlasses. The findings on mean age of respondents which was 30 years suggested that they probably were adults in their active and productive years. This is likely to positively influence their participation in Fadama farming. This agreed with Oguowa (1995) who in his study of effective rural farm labour mobilization, found out that 75% of the respondents were in the age bracket of 45 – 50 years.

Table 3.1: Social-Economic Characteristics of the Respondents (N=262)

Characteristics	Fadama Farmers		Non-Fadama Farmers		Total		Mean
	Freq.	%	Freq.	%	Freq.	%	
Age (Years)							
>20	12	9.1	14	10.6	26	9.8	
21 – 30	19	14.4	46	34.8	65	24.6	
31 – 20	41	31.1	52	39.4	93	35.2	*30
41 – 50	34	25.8	11	8.3	45	17.0	
>50	26	19.7	9	6.8	35	13.3	
Gender							
Male	87	65.9	86	65.2	173	65.5	
Female	45	34.1	46	34.8	91	34.5	
Marital Status							
Single	1	0.75	88	66.7	89	33.7	
Married	313	99.2	31	23.5	162	61.4	
Divorced	-	-	4	3.0	4	1.5	
Separated	-	-	8	6.1	8	3.0	
Widower	-	-	1	1	1	0.4	

Characteristics	Fadama Farmers		Non-Fadama Farmers		Total		Mean
	Freq.	%	Freq.	%	Freq.	%	
Family Size							
1 – 38	13	9.8	2	1.5	1.5	5.7	
4 – 6	62	47.0	87	65.9	149	56.4	
7 – 9	37	28.0	32	24.2	69	26.1	
10 – 12	17	12.9	11	83.3	28	10.6	6
>12							
Educational Status							
No formal education	66	50.0	26	19.7	92	34.8	
Did not complete primary school	13	9.8	70	53.0	83	31.4	
Completed primary school	46	34.8	10	7.6	56	21.2	
Did not complete secondary school	3	2.3	11	8.3	14	5.3	
Completed secondary school	4	3.0	15	11.4	19	7.2	
Primary Occupation							
Crop farming	-	-	101	75.5	101	38.3	
Fadama farming	131	99.2	-	-	131	49.6	
Livestock farming	-	-	25	18.9	25	9.5	
Fish farming	1	0.8	3	2.3	4	1.5	
Trading	-	-	1	0.8	1	0.4	
Craft making	-	-	1	0.8	1	0.4	
Work in people's farm	-	-	1	0.8	1	0.4	
Membership of Association outside FUAs							
Age group	2	1.5	1	4.5	3	1.9	
Credit union/esusu	130	98.5	20	90.9	150	97.4	
Religious group	-	-	1	4.5	1	0.6	

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Characteristics	Fadama Farmers		Non-Fadama Farmers		Total		Mean
	Freq.	%	Freq.	%	Freq.	%	
Farm Size (Hectares)							
0.5 & below	10	7.6	3	2.3	13	4.9	
0.6 - 10	59	44.7	107	81.1	166	62.9	
1.1 – 1.5	45	34.1	12	9.1	57	21.6	1.0
1.6 – 2.0	12	9.1	8	1.5	20	7.6	
>2	6	4.5	2	?	8	3.0	
Farming Experience (years)							
<5	5	3.8	3	2.3	8	3.0	
5 – 10	97	73.5	41	31.1	138	52.3	12
11 - 20	27	20.5	57	43.2	84	31.8	
>20	3	2.3	31	23.4	34	12.9	

Source: Field Survey, 2010

MEAN INCOME LEVEL OF RESPONDENTS

Table 3.2 shows the mean income distribution of fadama 1 participants and non-fadama participants in Edo State. The result shows that the mean income level of respondents were ₦126,190 for Fadama farming, ₦100,133 for crops, ₦113,333 for fisheries and ₦119,000 for livestock enterprise respectively.

Mean income level of respondents. Table 3.2 shows the mean income distribution of Fadama 1 participants and non-fadama participants in Edo State.

The result shows that the mean income level of respondents were ₦126,190 for Fadama farming, ₦100,133 for crops, ₦113,333 for fisheries and ₦119,000 for livestock enterprise respectively.

Table 3.2: Mean income distribution of respondents

Income Level	Fadama Farmers (₦)	Non-Fadama Farmers (₦)	Total (₦)
Farm income (Fadama)	126,190	-	126,190
Non-farm income (crop farming)	100,133	80,964	90,548.5
Non-farm income (fish farming)	113,333	100,000	106,666
Non-farm income (livestock)	-	119,000	119,000
Average farm income (total)	219,636	121,646	170,641
Average income (non-farm)	55,000	92,857	73,929

Source: Field Survey, 2010

Respondents' awareness of fadama 1 technologies in Edo State

Table 3.3 indicates the respondents' awareness of fadama 1 technologies in Edo State. This result that generally awareness of Fadama 1 technologies was high (86.4%) in Edo State for the technologies disseminated by Edo ADP extension agents including storage techniques, use of improved vegetable seeds, seed rate, agro chemical application, as well as recommended spacing and weeding.

Table 3.3 Respondents awareness of fadama 1 technologies in Edo State (N = 132)

Technologies Under Fadama I	Aware		Not Aware		Total	
	Freq.	%	Freq.	%	Freq.	%
Storage techniques	120	90.9	12	9.1	132	100.0
Construction of tube wells	114	86.4	18	13.6	132	100.0
Use of improved vegetable seeds	114	86.4	18	13.6	132	100.0
Fertilizer usuage	114	86.4	18	13.6	132	100.0
Herbicide usage	114	86.4	18	13.6	132	100.0
Recommended weeding time	114	86.4	18	13.6	132	100.0
Seed rate	114	86.4	18	13.6	132	100.0
Drilling o wash bores	108	81.8	21	18.2	132	100.0
Recommended planting time	108	81.8	24	18.2	132	100.0
Recommended spacing	108	81.8	24	18.2	132	100.0

Source: Field Survey, 2010

Respondents adoption of Fadama I technologies in Edo State

Table 3.4. Shows the adoption of Fadama I technologies in Edo State. Generally, the result shows that adoption of Fadama I technologies was low (42%) in Edo State.

Table 3.4: Respondents adoption of fadama I technologies in Edo State (= 132)

Technologies Under Fadama 1	Adopted		Not adopted		Total	
	Freq.	%	Freq.	%	Freq.	%
Tube wells construction	-	-				
Use of water pumps	-	-				
Drilling of wash bores	-	-				
Improved vegetable seeds	60	45.5				
Fertilizer usage	60	45.5				
Herbicide usage	60	45.5				
Insecticide usage	60	45.5				
Recommended planting time	60	45.5				
Recommended spacing	60	45.5				
Recommended weeding time	60	45.5				
Storage techniques	42	31.8				
Seed rate	12	9.1				

Source: Field Survey, 2010

Poverty status of Respondents

Table 3.5 showed the distribution of poverty status of respondents. It indicated that N113,760.67 was the established poverty line for this study. About half of the respondents (58.7%) were found to be non-poor. This implied living above the poverty line. However, 72.7% of Fadama I farmers were non-poor compared to 44.7% of non-Fadama farmers who were non poor since their mean income exceeded the established poverty line.

Table 3.5: Poverty Status of Fadama 1 and non-Fadama Farmers in Edo State.

Poverty Status (N)	Fadama Farmers		Non Fadama Farmers		Total	
	Freq.	%	Freq.	%	Freq.	%
Very poor (<56,880.33)	-	-	25	18.9	2.5	9.5
Moderately poor (56,880.33 – 113,760.67)	36	37.3	48	36.4	84	31.8
Non-Poor (> 113, 760.67)	96	72.7	59	44.7	155	58.7
Total	132	100.0	131	100.0	264	100.0

Source: Field Survey, 2010.

Constraints that affected respondents of Fadama I in Edo State

Table 3.6 showed that results of the constraints that affected respondents of Fadama I in Edo State. It indicated that the most serious of all the constraints was inadequate credit facilities (Mean = 4.5, SD = 0.5). Without credit, farmers will find it difficult to purchase the expensive Fadama infrastructures disseminated by Edo ADP such as tubewells/wash bores/water pumps. This limitation could have possibly accounted for the reason for low adoption by respondents in this study.

Other constraints in this study included: inadequate extension agents (Mean = 3.09*, SD = 0.6) poor access to Fadama in puts (mean = 4.00*, SD = 0.0), poor accessibility to tubewells/was bores/water pumps (mean = 3.91*, SD = 0.4). Poor storage (mean = 3.59*, SD = 0.8).

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Table 3.6: Constraints that Affected Respondents of Fadama I in Edo State

Constraints	**Fadama Farmers**		**Non Fadama Farmers**		**Total**	
	Freq.	%	**Freq.**	%	**Freq**.	%
Inadequate Credit/Capital	4.50*	0.5	2.64*	1.2	3.57*	1.3
Poor access to Fadama I inputs	4.00*	0.0	-	-	4.00*	0.0
Poor accessibility to tubewells/ wash bores/water pumps	3.91*	0.4	-	-	3.91*	0.4
Poor storage	3.59*	0.8	-	-	3.59*	0.8
Unstable government policies/ access to extension services	3.36*	0.6	3.72*	0.6	3.54*	0.6
Transport problem	3.18*	0.9	3.78*	1.2	3.48*	1.1
Inadequate extension staff		1.0	2.71*	1.2	2.90*	1.1
High input cost	-	-	3.64*	0.9	3.64*	0.9
Middle men	-	-	3.48*	0.9	3.48*	0.9
Land tenure	2.9	5	-	-	2.09*	0.4
Lack of farmland	2.00	5	1.95	0.7	1.97	0.6

Serious (Mean ≥ 2.50)
Source: Field Survey, 2010

HYPOTHESIS TESTED

H_{0_1} : There is no significant difference in the level of income of Edo ADP Fadama I participants and non-Fadama participants. T-test analysis was employed and the result shows that farmers who participated in Fadama I realized higher farm income of N232,081.08 per annum compared to non-fadama – Fadama farmers whose farm income per annum was N190,621.59. The result further indicate that (t – 1.349) and P = 0.179) at $P \geq 0.05$. This implied that the difference in income between Fadama farmers was significant at 5% level.

CONCLUSION AND RECOMMENDATIONS

The findings of this study have shown that Fadama I had made a significant effect on poverty alleviation among small-scale farmers in Edo State. The fadama I participants realized increased farm income compared to non-fadama participants. In addition, the fadam I respondents were non-poor as well as the non-fadama participants. The result also reveals that participants in Fadama I benefited from some Fadama access roads that were constructed for example, at Ogba, Illushi and Anegbette communities under fadama I project in Edo State. However, access to credit facilities is a major constraint to the fadama users.

RECOMMENDATIONS

Based on the key findings of this research, the following recommendations are hereby suggested.

1. There is the need for Edo State ADP to link Fadama farmers with credit institutions (formal and informal) in order to enhance the respondents' access to available credit.
2. Measures that could improve adoption of Fadama I technologies to farmers such as regular farmers' workshops/seminar, sensitization/advocacy campaign on Television and Radio to increase farmers' knowledge and attitude should be organized by Edo ADP so as to raise the adoption level from low (42%) as identified in this study to higher adoption of (80%) or more.
3. Government should encourage more female farmers' participation in future fadama programmes since the study identified that about 35% of the respondents were females.
4. More access roads should be constructed in rural communities to solve the problem of transportation identified as a serious constraint that affected the respondents in this study

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