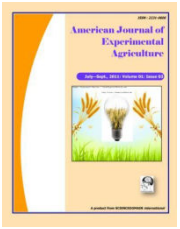

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Effect of World Bank Assisted Fadama II Project on the Performance of Fish Farming in IMO State, South East Nigeria: A Comparative Evaluation

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ABSTRACT

The study was designed to investigate the effect of Fadama II project on the performance of fish farming in Imo State. A sample of 30 fadama fish farmers and 30 non-fadama fish farmers were selected by multistage random sampling technique. Data were collected with a well structured questionnaire administered to 60 randomly selected fish farmers. Data collected were analyzed using descriptive statistics, inferential statistics, productivity model and ordinary least square multiple regression technique. The results show that the socio-economic characteristics of the farmers show that majority of the respondents were educated and had appreciable experience in fish farming which enhances their activities. Size of pond and capital invested in the business are important factors that determine output of both group of farmers. Cost of water was found to be insignificant and negative among the non-fadama farmers. It becomes imperative therefore that in order to enhance farmers' income as well as their standard of living, it is recommended that they should be encouraged to join the fadama projects.

Keywords: Profit; Fadama users; non-fadama users; fish farmers;

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1. INTRODUCTION

In recent times, the global focus has been on food security and poverty alleviation; this is in response to the increasing threats of food insecurity and poverty in the world. This is evident in the fact that over 70% of the population live below 1US dollar per day. To achieve the Millennium Development Goal of halving the proportion of hungry people by 2015, it was projected that 22 million people must achieve food security every year (IFPRI, 2005). The achievement of this target is important for reducing hunger and poverty (FAO, 2005). The lingering poverty incidence among other things has led to low agricultural production and low productivity among farmers; this has ultimately limited their traditional role in economic development.

In an attempt to break this vicious cycle of poverty and improve the performance of the sector, the Nigerian government over the years introduced and implemented several policies and programmes aimed at remedying the situation (Ajibefori and Aderinola, 2004). One of such efforts towards boosting agricultural production is the introduction of second fadama development project. The fadama II project is a follow-up on the first phase of the project funded by World Bank between 1993 and 1999 which built on the success of pump and wash bore based farming and supervised by the ADPs (Blanch and Ingawa, 2004).

Fadama, the hausa name for irrigable land refers to flood plains and low-lying areas used for farming during the dry season and sometimes defined as alluvial lowlands formed by erosion and depositing action of rivers, streams etc (Ingawa et al, 2004; Abdullahi et al., 2006; Nwachukwu and Onyenweaku, 2007). Similarly, Kolawale and Scoones (1994) defined fadama as an hausa word meaning valley bottom, flood plains along major savannah, rivers and /or depression on the adjacent low terraces. However, fadama is low-lying flood plains consisting of alluvial deposits with extensive exploitable acquifers ideal for irrigated crop production (World Bank, 1992). The Fadama II project is a World Bank assisted project aimed at sustainably increasing the income of fadama users (NFCO, 2007). At the national level, the project is estimated to benefit about 4 farm families (24 million people from the participating states) (IMSFCO, 2007). The widespread adoption of the technology enables farmers to increase production by more than 300% in some areas (FMARD, 2001). Naturally, dry season farming renders itself easily to the production efforts of small scale producers in Nigeria, since millions are willing to be carried along, in harnessing efforts for increased productivity (Idachaba, 2004). This is a welcome development in Nigerian Agriculture for the desired food security as observed by (Adewumi, 1997). One of the areas in which fadama assists resource poor farmers is through fish farming. Fish farming bridges the gap between the protein demand and supply. In line with this, heads of states and Government, international and regional organizations, called for urgent action (Anon, 2009). In response to the call, a number of initiatives have emerged or are emerging to address this important challenge in Nigeria (Remans et al, 2009). Such initiatives according to Abo (2003) include the National Accelerated Food production Programme (1974), River Basins Development Authorities (1975), Operation Feed the Nation(1976), Green revolution(1979), Integrated Rural Development Projects (1980), Agricultural Development Programme (ADP) (1985), Back to land Programme and National Directorate of foods, Roads and Rural Infrastructure (1988), National Agricultural Research Projects - World Bank Assisted(1991), National Agricultural support Programme,1992), National Programme on Food Security(1999), and the presidential initiative on Livestock etc for production, processing and export (2002) and a host of other programmes have been designed. The impact of these policies, however, has been shadowed (Baba and Singh, 1998) as there are still low levels of fish production in the study area. Therefore, the study aimed at the Effect of World Bank

Assisted Fadama II Project on the Performance of Fish Farming in Imo State, South East Nigeria: A Comparative Evaluation with a view to proffering solutions as well as making policy recommendations based on the study.

The objectives of the study therefore include to:

i. determine the socio-economic characteristics of the two fish farmer categories in the area.
ii. estimate and compare the productivities of fadama and non-fadama fish farmers.
iii. determine the factors influencing the output of fadama and non-fadama fish farmers in the area.

2. MATERIALS AND METHODS

The study was carried out in Imo state. Imo state has 27 Local Government Areas and a population of 3,934,899 million people (NPC, 2006). Multistage Random Sampling technique was used in the selection of the respondents. In the first stage, two agricultural zones namely, Owerri and Orlu zones were randomly selected. In the second stage, three local government areas were randomly selected from each of the two agricultural zones, making a total of 6 local government areas. In Owerri agricultural zone, Owerri North, Ikeduru, Ngor-Okpala local government areas were selected. Then in Orlu agricultural zone, Orlu, Nwangele and Nkwerre local government areas were also selected. Then, 5 fadama –user groups (FUGs) were purposively selected from each of the local government areas as they are the target group; making a total of 30 fadama fish farmers. Also, 5 non-fadama fish farmers were also selected randomly from each of the same 6 local government areas, making a total of 30 non-fadama fish farmers.

Data for this study were collected from both primary and secondary sources. Primary data were collected through the use of structured questionnaire. The secondary information were obtained from textbooks, internet, library, journals, magazines, seminar papers, etc.

Data were analysed using simple descriptive statistics such as percentages, means and frequencies, productivity model and ordinary least square multiple regression technique.

In using the ordinary least square multiple regression technique, four functional forms were fitted into linear, semi-log, double log and exponential equations. The model with the highest value of coefficient of multiple determination (R^2), highest no of significant variables and F-values were selected as the lead equation.

The Productivity model is stated thus:
Productivity = Q / X
Where,
Q = Total value of output (Naira)
X = Total value of inputs used (Naira)

The model is stated implicitly as:
$Y = f (X_1, X_2, X_3, X_4, X_5, X_6, e)$
Where
Y = Output (Naira)
X_1 = Pond Size (m^2)
X_2 = Cost of fingerlings (Naira)
X_3 = Cost of feed (Naira)

X_4 = Cost of labour (Naira)
X_5 = Cost of water (Naira)
X_6 = Capital (Naira)
e = Error term
It is expected apriori that;
X_1 and X_6, > 0; X_2, X_3, X_4 and X_5 < 0

3. RESULTS AND DISCUSSION

Table 1 shows the mean age of the fadama fish farmers which was found to be 30years while non-fadama fish farmers were older with 47years as their mean age, indicating that majority of the respondents were middle aged farmers who are still active, vibrant and dynamic and are more likely to adopt innovations better and faster than their earlier counterparts.

Table 1: Socio-economic characteristics of respondents

Categories	Fadama Users		Non-fadama Users	
	Frequency	%	Frequency	%
Age (yrs.):				
21-30	5	16.67	3	10.00
31-40	8	26.67	5	16.67
41-50	10	33.33	9	30.00
51-60	4	13.33	11	36.67
61-70	3	10.00	2	6.67
Total	30	100.00	30	100.00
Sex				
Male	18	60.00	21	70.00
Female	12	40.00	9	30.00
Total	30	100.00	30	100.00
Marital Status				
Single	9	30.00	4	13.33
Married	21	70.00	26	86.67
Total	30	100.00	30	100.00
Years of experience				
1-6	22	73.33	9	30.00
7-12	6	20.00	19	63.33
13 and above	2	6.67	2	6.67
Total	30	100.00	30	100.00
Level of Education				
1-6	8	26.67	9	30.00
7-12	13	43.33	16	53.33
13 and above	9	30.00	5	16.67
Total	30	100.00	30	100.00
Household Size				
1-3	6	20.00	7	23.33
4-6	16	53.33	9	30.00
7-9	5	16.67	12	40.00
10 and above	3	10.00	2	6.67
Total	30	100.00	30	100.00

This could be due to the fact that the younger farmers are more likely to adopt a technology; i.e. to join fadama project.

The mean number of years spent in school for fadama fish farmers was 9years and those of non-fadama fish farmers was 7years, indicating that though the respondents in the area are moderately educated but the fadama users were more educated than their counterpart. This is likely to influence the adoption behavior of the farmers positively which may impact positively on output.

The table further showed that fadama II fish farmers were significantly experienced. This is evident in their mean years of 5 years spent in school. This is probably due to the fact that Fadama project is just about 5 years old in the study area. However, non-fadama fish farmers have a mean experience of 8years. A reasonable proportion of the fadama users were males (60%) while women are (40%). Men join fadama project more than women who contribute more to food production in the area. Again, non-fadama fish farmers have more male farmers (70%) than their female counterparts (30%). This is due to the fact that men are more involved in fish production than women. There is ample research evidence to support the argument of women's high participation and contribution to agricultural development in Nigeria (Ifenkwe, 2009). The table further showed that 70% of the fadama fish farmers are married while 86.67% of non-fadama fish farmers are married. This implies that married farmers have more responsibility and would embrace more projects that will benefit them economically so as to be able to meet their family financial obligations. Nevertheless, the single respondents may not join new projects as they may not have much to bother about. Both group of farmers had a mean household size of 5. This moderate household size may be as a result of the fact that the respondents are educated hence appreciates the idea of moderate family size.

Table 2 shows that the fadama II fish farmers were more productive with a mean value of 9.13 while that of non- fadama fish farmers were 3.61. This may be due to the facilities provided to support fadama II fish farmers.

Table 2: Productivity of fadama and non-fadama fish farmers.

Productivity (Ratio)	Fadama Fish Users		Non-fadama Fish Users	
	Frequency	%	Frequency	%
1.0-3.0	0	0.00	17	56.67
3.1-5.1	2	6.67	7	23.33
5.2-7.2	4	13.00	3	10.00
7.3-9.3	9	30.00	2	6.67
9.4-11.4	10	33.33	1	3.33
11.5 and above	5	16.67	0	0.00
Total	30	100.00	30	100.00

3.1 Factors Influencing the Output of Fadama Users

Tables 3 and 4 show that the double log function was chosen as the lead equation in the two groups of farmers, based on having the highest value of the coefficient of multiple determination (R^2), conformity with apriori expectations and having more significant variable coefficients.

Table 3: Factors influencing the output of fadama fish farmers

Variable	Linear Form	Semi log Form	Double log Form	Exponential Form
X_1 (Pond size)	10.3087	2.1737	0.0633	0.0082
	(1.1436)	(1.1083)	(4.9843)**	(3.5652)**
X_2 (Fingerling)	-7.5095	-3.8213	-0.0658	-0.0059
	(-4.1387)**	(-1.2528)	(-3.0605)**	(-4.5385)**
X_3 (Feed)	-4.0528	-4.6613	-0.0759	0.0067
	(-1.0435)**	(-1.1686)	(-3.4977)**	(-1.3137)
X_4 (Labour)	-5.1987	-4.9611	0.0911	0.0093
	(-1.0435)	(-4.8933)**	(-2.5518)*	(-1.1084)
X_5 (Water)	-7.0983	-3.9144	0.0982	-0.0048
	(-4.4772)**	(-1.2983)	(-1.0948)	(-1.2308)
X_6(Capital)	6.1153	2.7295	0.0658	0.0081
	(1.0517)	(1.242)	(3.0323)**	(3.8571)**
Constant	591.3702	407.2008	319.4203	257.9008
R^2	0.4832	0.4016	0.7942	0.6022
F-Value	3.5793	2.5744	14.8727	5.8015
Degree of freedom	23	23	23	23
N	30	30	30	30

** = Significant at 5%; ** = Significant at 1% ; t-ratios are the values in bracket ;*
Source: Field survey Data (2010)

3.2 Factors Influencing the Output of Non-Fadama Users

Table 4: Estimate of multiple regression result on factors influencing output of Non-fadama users

Variable	Linear Form	Semi log Form	Double log Form	Exponential Form
X_1 (Pond size)	9.8417	1.8217	0.0659	0.0072
	(1.1981)	(2.5898)**	(2.903)**	(2.6667)**
X_2 (Fingerling)	-7.1904	-2.6592	-0.0813	-0.0091
	(-2.3152)*	(-1.2961)	(-3.4159)**	(-2.4444)*
X_3 (Feed)	-5.1186	3.8613	-0.0917	0.0064
	(-1.1148)	(-1.3204)	(-3.3225)**	(-1.0847)
X_4 (Labour)	-10.8291	-5.5266	0.0885	0.0083
	(-3.5922)**	(-1.0969)	(-4.0411)**	(-2.8621)**
X_5 (Water)	-14.3902	-2.5328	0.0643	-0.0091
	(-4.0989)**	(-1.0374)	(-3.0766)**	(-1.0581)
X_6(Capital)	11.0679	3.8826	0.0944	0.0073
	(1.1199)	(1.3096)	(3.0849)**	(2.6071)**
Constant	603.1092	425.4694	326.1639	266.0825
R^2	0.5916	0.3908	0.8529	0.6241
F-Value	5.5393	2.4579	6.3814	6.3814
Degree of freedom	23	23	23	23
N	30	30	30	30

** = Significant at 5%; ** = Significant at 1% ; t-ratios are the values in bracket*
Source: Field survey Data (2010)

The results showed that Pond Size (X_1), Capital (X_6) were significant at 1% among the two group of farmers implying that the greater they are, the higher the output obtained by the respondents hence, they have a huge influence on the revenue of fish farmers. Again, these factors are important determinants of output by both group of fish farmers in the area. However, Cost of fingerlings (X_2), Cost of feed (X_3) are negatively significant at 1% among the fadama users implying that the higher they are, the less the output obtained from fish farming. However, labour (X_4) was negatively significant at 5%, implying that it is not a strong determinant of output. This may be due to the collective /team work culture by the fadama users. Cost of water (X_5) was insignificant though negative among the fadama farmers. This may due to the fact the project makes water available by sinking borehole for the farmers, hence little or no cost is incurred on water. Meanwhile, Cost of fingerlings (X_2), Cost of feed (X_3), labour (X_4) and cost of water (X_5) are negative and significant at 1% among the non-fadama fish farmers implying that the higher they are, the less the output obtained from fish farming. This conforms to the apriori expectation.

R^2 (coefficient of multiple determination) were found to be 0.7942 in fadama users and 0.8529 in non- fadama users implying that 79% of the variability in output was explained by the combined effect of the independent variables. Also 85% of the variability in output of non-fadama users was explained by the combined effect of the independent variables included in the model.

4. CONCLUSION AND RECOMMENDATION

The study compared the output obtained by the fadama II fish farmers and non-fadama II fish farmers Imo State and found that fadama II fish farmers were more productive and performed better than their counterparts. The socio-economic characteristics of the farmers showed that male farmers were more involved in fish farming among the two groups of farmers and the fadama II fish farmers had younger people than their counterparts.

Fadama project is a very beneficial project in the area especially in terms of fish production as fadama users did better than non-fadama users.

Based on the findings of this study, the following recommendations are proffered:

- The project should encourage women participation on fish farming as involvement of women who are the custodian of food production will make remarkable achievements in fish production.
- Farmers should be encouraged to join fadama projects as it will enhance their productivity in fish production.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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