

Revealing the Impact of Fadama III Project on the Income Level of Beneficiary Farmers in Plateau State, Nigeria

*A. A. Girei¹, N. D. Saingbe¹, M. A. Bitrus¹ ,, and I. H. Bassey²

¹Department of Agricultural Economics and Extension, Nasarawa State University, Keffi, Nigeria.

²Department of Economics, Kwararafa University, Wukari, Taraba State, Nigeria

Abstract: The study examined the impact of Fadama III project on the income level of beneficiary farmers in Plateau State. The assessment was carried out before and after project implementation within five districts in the study area. The findings were based on the use of structured pretested questionnaires, personal interview and secondary data. One hundred questionnaires were randomly distributed in equal proportions to ten Fadama III beneficiary households belonging to Fadama Users Groups (FUGs) and ten non-beneficiary households which serve as the control group within the same districts. The Double Difference (DD) estimator was used in determining the outcome measures between beneficiaries and non-beneficiaries of the project. The study revealed that more men (61%) compared to women (39%) participated in Fadama activities in the study area. The use of group participation was encouraged thus the use of FUGs & EIGs. Most of the participants were married (70%) with few singles (18%) and widows (8%). More young people participated; the average age bracket was 41 years. A reasonable number of literate persons (63%) participated in the programme. Most participants (79%) employ other means of income generation through diversification of enterprises. The average income of beneficiaries before project implementation was N3,051,000.00 while the income of the non-beneficiary group was N3,192,000.00 on the other hand, the real average income of beneficiaries increased to N4,208,000.00 representing 27.49%, for the non-beneficiaries the income rise to N3,615,000.00 representing 11.7%. The high percentage rise for beneficiaries was as a result of participation in the project.

Keyword: Understanding, Impact, Fadama III, Project, Income Level, Beneficiary, Farmers

INTRODUCTION

The growth in income of farmers is strongly correlated with the overall growth of the economy especially in the agricultural sector. This fact has been demonstrated in cross country and individual country studies [1]. There is an indirect link between poverty status and poverty reduction among the farming households through the relationship between productivity, income growth and poverty [2]. Therefore, in order to reduce poverty, fundamental economic policies should aim at promoting rapid economic growth with implication for rural farmers increased production. [3]

believed that an effective approach towards more comprehensive poverty reduction is to enhance economic growth especially at the rural (farm) level.

[4] also argued that macro-economic policies that promote growth in income are likely to lead into poverty reduction. Although, in agriculture, positive changes in price can provide incentives for agricultural production and specialization, which in turn may lead to growth and distribution of income through employment generation and revenue enhancement, and consequently, poverty reduction. Similarly, at the micro level, enterprises that promote income

growth and distribution enhance the revenue of the rural farm households leading to their poverty reduction. Also, improvement in farmer's productivity and output would lead to income growth and consequently poverty reduction. [3].

[5] is of the opinion that agriculture has already made a significant contribution to the economic prosperity of advanced countries and its role in the economic development of less developed countries is of vital importance. This can be achieved through increased agricultural output and productivity which contributes substantially to an overall economic development of a predominantly agricultural populating of a country like Nigeria. The [6] also stated that, low productivity in agriculture is the cause of high incidence of food insecurity and poverty in Nigeria.

[2] observed that productivity improvement for the Nigerian small scale farmers is the ultimate if development is to take place and be sustained. This proposes that in Nigeria, the greater part of food production (70%) made available to consumers, is in the hands of small-scale subsistence farmers who reside mostly in the villages or rural areas (of the country). However, these farmers farm with local implements and unimproved inputs which limit their productivity. More so, if the farmer is to be alleviated from poverty, the productivity of the farmer should be improved to support increased income, better standard of living and serves as a check on environmental degradation consequently.

Resources committed to agriculture should generate high productivity and the productivity should be transformed into an improvement in the quality of life of targeted Nigerians. Therefore to achieve prosperity and overcome stagnation, there is need to increase growth in all sectors of the economy; such growth will be the most efficient means of alleviating poverty and generating long term sustainable development. Resources should also be used more efficiently with much attention paid to eliminating waste, as this will lead to an increase in productivity and income in the long run.

Similarly, [1] opines that for growth to have some meaningful impact on poverty, it must occur in sectors in which a large proportion of the poor derive their livelihood. It is an irony however, that an agrarian country like Nigeria

could fail in its successive effort to utilize its large resources for producing food and income wealth for the effective well-being of its citizenry.

Therefore, it is necessary to observe the impact of the National Fadama Development Project (NFDP), among the several projects in order to promote agricultural and economic development in Nigeria; it is meeting such needs among others. The programme was established in states with Fadama potentials through the pooled World Bank loan which is aimed at increasing and financing small scale irrigation. Also it has the objective of increasing the income and skills of beneficiaries through capacity building to improve their livelihoods by increasing income generating activities [7] National. The Third National Fadama Development Project popularly known as Fadama III emerged as a follow up after the success story of second National Fadama Development project.

PROBLEM STATEMENT

The Federal Republic of Nigeria has embarked on several projects with the aim of improving the income and productivity of the small scale rural farmers. However, these projects have neither generated increased income nor improved the living standard of the poor rural farmers in Nigeria. The United Nations Development Programme (UNDP) in Human Development Index (HDI) ranked Nigeria among the 44 poorest countries of the world and Nigeria is recently placed among the 26 poorest countries with more than 70% estimated to be living below the internationally defined poverty level of one dollar per day [8], hence this has been a major and similar problem among the small-scale rural farmers in Plateau State. It is on recorded that since independence, the Federal Government of Nigeria in conjunction with the United Nations and other developed agencies have initiated Agricultural Economic development related projects of the farmers of which, the NFDP is one. Over the years since its establishment, it is necessary to observe the level of its performance with the implication to satisfying the needs of the benefiting farmers. Therefore, this

study intends to assess the impact of Fadama III project on the income of beneficiary farmers in Plateau State.

OBJECTIVES OF THE STUDY

The broad objective of the study is to assess the impact of the third National Fadama Development Project on the income level of the farming beneficiaries in Plateau State, while the specific objectives are:

- i. To examine the socio-economic characteristics of Fadama III farming beneficiaries and their influence on the farming activities of the farmers.
- ii. To identify the reasons for Fadama farming by Fadama Users.
- iii. To ascertain the income level of Fadama III farming beneficiaries, before and after the project.
- iv. To identify constraints associated with the Fadama III farming beneficiaries of the project.

Justification for the Study

[9] identifies the small scale farmer as the major producer of both food and export crops in the country. This has essentially affected to a larger extent the food and livestock demand of the households and plays a crucial role in providing raw materials for both large and small-scale industries in the country. The small -scale holder needs to be well informed so as to having the right mind set and positive attitudes which subsequently leads to increased productivity and income. Since most of the Nigerian population lives in the rural areas and most of these people are subsistence farmers who still live below the poverty line, the development objectives of the Fadama project which is to increase the income of the rural and water resource users on a sustainable basis can therefore fit appropriately into the situations of farmers in Plateau State and subsequently in Nigeria at large. Since there are available water-logged plains and abandoned tin – mine ponds around this area that could be effectively utilize for fadama farming and other activities.

Hypothesis

There is no relationship between the socio-economic characteristics of the income level of Fadama III beneficiaries and non-beneficiaries.

The Concept, “Fadama”: “Fadama” is a Hausa word for irrigable land. Usually it is a low-laying plain underlaid by shallow aquifers found along Nigeria’s major river systems. Such lands are especially suitable for irrigated production, fishing and traditionally provide feeds and water for livestock [7].

Similarly, “Fadama” can also be referred to a low-laying water logged area mostly characterized by fine-alluvial or clayey soil, suitable for irrigated crop production during the dry seasons or drought periods. When irrigated, Fadama provides good moisture for crop root establishment. The Fadama land facilitates crop production all year round and increases crop productivity.

[10], have it that the Fadama lands have high potentials and agricultural values several times more than the adjacent uplands. They are low-laying and subject to seasonal flooding along the bank of streams or depressions.

Again, [11], stated that, Fadama development is a typical form of small scale irrigation practice characterized by flexibility of farming operations, low input requirement, high economic values, minimal social and environmental impacts, and hence, conform with the general criteria for sustainable development. Akinbile, in viewing at Fadama farming as a way of improving the land quality, showed that pumping water from wells in Fadama farming areas helps in controlling the water table and its therefore serves as an anti-water logging device. Similarly, the practice increases infiltration and leaching of harmful salts from the root zone thereby providing additional basis for impact sustainable Fadama development.

A Review of Agricultural Development Programmes in Nigeria: A programme according to [12] is a tool for achieving the objectives stated in the National Development Plan of a Nation. Each programme has its own objectives

which are consistent with the overall development plan from which a set of specific objectives are identified and selected.

The need for support for agricultural development in Nigeria motivated the government to establish several programmes in a bid to improve agricultural production with the aim of improving the living standard of its teeming population. Some among these programmes include, The Farm Settlement Scheme (FSS, 1972), National Accelerated Food Production Programme (NAFPP, 1973), Operation Feed the Nation (OFN, 1976), River Basin Development Authority (RBDA, 1977), the Green Revolution, (GR, 1979), Agricultural Development Programme (ADP, 1975), Agricultural Transformation Agenda (ATA, 2011) to mention but a few. [13], however, observed that some of these agricultural policies could not yield positive effectiveness either because they have been misguided or because their impacts had been swamped by macro policies affecting inflation, exchange rates or cost of capital.

The National Fadama Development Project (NFDP):

Recognizing the challenges posed by the ineffectiveness of the National Development Programmes, the federal government has identified the modernization of the agricultural sector as a priority.

It is generally observed that, small scale irrigation was adjudged as one of the most successful initiatives that had led to the follow-up project called National Fadama Development Project within the Fadama areas through the use of improved but simple technology.

Thus [14] reported that in developing countries where agriculture is in the hands of small-scale peasant farmers, the demands for inputs are usually high. The small-holders need simple technology to substitute their local equipment at a subsidized rate. This will thereby improve their income.

Since the Fadama project recognizes the irrigation scheme as a developmental project, [15] pointed out that the development of large and small scale irrigation scheme in Fadama land is part of the strategies for rural development

which creates employment opportunities in the rural areas and also maximizes the use of land.

In the same vein, [16], opined that in the development of irrigation schemes, the common national aim may include economic efficiency in the use of resources, gaining of foreign exchange through the production of export crops to substitute for export, development and modernization of rural economy. This will ensure that food supply (qualitatively and quantitatively) keeps pace with increasing population. Significantly, increasing the production of agricultural raw materials to support agro based industries will facilitate a smooth integrated development of the agricultural potentials such as cultivating Fadama land.

The National Fadama Development Project (NFDP) is an International Development Project (IDP) credit facility, cofounded by the Federal Government of Nigeria (FGN), State Government (SG), Local Government (LG) and benefitting communities through counter funding and beneficiary contribution respectively.

METHODOLOGY

Area of Study: The study was conducted within Bokkos Local Government Area of Plateau State, Nigeria. Plateau State is found in the central part of Nigeria, which lies within the middle belt region of the country. It can be located between latitude 80°28'N and longitude 80°32' and 100°38'E. The state has a land area of 30,913km² with an estimated population of 3,553,440 [17]. The climate of the state is near temperate (11°C) and is ideal for numerous agricultural activities.

Bokkos local government area of Plateau state was created on the 7th October 1991 out of Mangu Local Government Area of the State. It is located within the central senatorial zone of the state. Bokkos the local governments headquarter is located 22km south-west of Jos, the Plateau State capital. Bokkos Local Government Area shares boundary with Mangu LGA in the West, Nassarawa State in the East, barkin Ladi local government area in the north and Quan-pan local government area in the south.

The LGA occupies an area of about 3,053 square kilometers with abundant rainfall and sunshine. The

temperature can be as low as 11°C between November and February. The local government is made up of eight districts which make up the major towns, they include Bokkos, Daffo, Mushere, Richa, Manguna, Sha, Toff and Kamwai with Ron, Kulere and Mushere as the major languages. It has an estimated population of 178, 454 [17]

Agriculture is the predominant occupation of the people. The area is endowed with a wide expanse of arable rich fertile soils which enhance the production of various crops and livestock. Crops produced include maize, Irish potatoes, acha, millet, cocoyam, beans, soya beans, sugar cane, palm oil, palm kernel, yam, sweet potatoes, assorted fruits and vegetables. Livestock reared are cattle, sheep, goats, pigs and poultry. Mineral resources include tin, columbite, kaolin, Gemstones, marble among others.

Population and Sampling Procedure: In analyzing the impact of Fadama III project on beneficiaries, the sample frame was divided into two strata; the direct project participants (i.e Fadama III beneficiaries) and Non Fadama III beneficiaries. This allows for estimation of direct effect of Fadama III project beneficiaries to non-beneficiaries within the communities. A total of one hundred (100) structured questionnaires were distributed in equal proportion to direct project participating and non-participating households based on their farming activities (crop and livestock farming) as related to project implementation of Fadama Users Groups (FUGs).

Method of Data Collection: Data for the study was collected through the use of structured questionnaires in five (5) districts within the study area which include Bokkos, Daffo, Mushere, Manguna and Toff. Information were randomly collected from ten (10) Fadama III participating households belonging to Fadama User Groups (FUGs) from each of the five participating districts to give a total of fifty households.

In the same vein, ten (10) non-Fadama III participating households from the same districts were randomly selected to give a total of fifty households which serves as control group.

Analytic Tools: Descriptive analysis was used to achieve objectives 1, 2 and 4 using percentage mean and frequency

while the double difference (DD) Estimator was used to compare variations of results in outcome measures for objective 3.

The Double Difference Estimator also known as Difference in Difference method [18] has the formula

$$DD = (Y_{P_1} - Y_{P_0}) - (Y_{nP_1} - Y_{nP_0})$$

Where

Y_{P_1} = Outcome (e.g. income) of beneficiaries after the project started

Y_{P_0} = Outcome of beneficiaries before the project started

Y_{nP_1} = Outcome of non-beneficiaries after the project started

Y_{nP_0} = Outcome of non-beneficiaries before the project started

The advantage of the Double Difference Estimator is that, it nets out the effects of additive factors (whether observable or non-observable) that have fixed (time invariant) impact on the outcome indicator (such as the abilities of farmers or the inherent quality of natural resources), or that reflex common trends affecting project participants and non-participants equally such as changes in prices or weather [19].

In principle the DD approach can be used to assess project impacts without using any other statistical tool (such as the propensity score matching (PSM) method as applied by [20] as it will produce unbiased estimates of impact as long as these assumptions hold, hence the adoption of this method in this study for estimating the project impact among the Fadama III beneficiary farmers of Bokkos LGA Plateau State, Nigeria. This method was also applied by [21]

RESULTS AND DISCUSSION

Socio Economic Characteristics of Respondents: The socio-economic profiles of the respondents were examined under various variables such as gender, age, educational level, occupation, marital status, household size, years of farming experience, source of information on Fadama programme, types of farming practice and membership cooperative society. Table 1 reveals the frequencies and percentage of the variables studied

Table 1: Distribution of the Respondents by Socio-economic characteristics

Variables	Frequency	Percentage
Gender		
Male	61	61
Female	39	39
Age range (years)		
21 – 30	13	13
31 – 40	40	40
41 – 50	26	26
51 – 60	18	18
$\bar{X} = 41$	3	3
61 and above		
Educational Level		
Non-formal	1	3
Primary	3	33
Secondary	33	63
Tertiary	63	
Occupation		
Full time	21	21
Farming and others	79	79
Marital Status		
Married	74	74
Single	18	18
Widow	8	8
Household size		
1 – 5	44	44
6 – 10	48	48
11 – 15	7	7
16 and above	1	1
$\bar{X} = 6$		
Years of farming experience		
1 - 10	16	16
11 - 20	32	32
21 – 30	22	22
31 – 40	8	8
41 and above	2	2
$\bar{X} = 15$		
Source of Information on Fadama		
III	9	9

Radio	2	2
Television	28	28
Friends and neighbors	8	8
Other members	2	2
Family members	-	-
PADP/FDA	-	-
Buyers	1	1
Fadama Facilitators		
Types of farming system practical	78	
Crop farming	22	78
Animal farming		22
Membership of Cooperative society		
Member	66	66
Non-member	34	34

Source: Field survey, 2015

Distribution of Respondents by Gender: Table 1 shows that majority (61%) of the respondents were male while 39% were females. This indicates a dominance of the male folks over females in Fadama III activities within the study area. This result correspond with the work of [22] findings on the impact of food security among rice farmers in Kogi State, where 51.8% of the farmers were males whole 25% were females. Although women dominate farming activities in some communities e.g. among the Beroms while in others religious belief instructs for seclusion as in the purdah of Islam. Women also dominate in carrying out lighter processing activities (author's personal observation).

Distribution of respondents by Age: The ages of the respondents in this study indicates that about 40% of the farmers are between the age brackets of 31 to 40 while 26% are between the ages of 41 – 50 years. The mean age bracket of the farmers is 41 years. This implies that majority of the farmers are still within their active age. This could be due to the fact that many young school leavers have no option for income generation than farming activities due to inadequate white collar jobs. This is evident in Table 1.

Educational level of the farmers: Again, from Table 1, the investigation shows that about 1% of the respondents did not have any formal educational background, 3% primary education, 33% had secondary school education while 63% of the farmers had tertiary education, this implies that majority of the farmers have had a form of formal education at different levels. This is in agreement with the findings of [21], that literacy level makes easier the implementation of projects. Also, more literate people are becoming interested in farming no matter their professions. [23] are also of the opinion that education has been a factor in the adoption of modern practices. It is generally considered an important

variable that could enhance farmers' adoption of new technology.

Occupation of Respondents: The distribution of respondents on Table 1 based on the involvement in farming activities showed that most of the farmers (79%) employed other off farm activities as a supplement to the family income. It is evident from table 4.1 that only about 21% of the farmers had no secondary occupation apart from farming. This implies that the respondent have other sources of increasing their family income through diversification of enterprises. This could be that dependent on just one source of income does not meet the family needs adequately.

Marital Status of Respondents: It is evident from Table 1 that a greater proportion (70%) of the respondents were married while 18% and 8% were single and widowed respectively. This findings show that married people are involved in farming activities than single persons in the study area. Couple can depend on one another for different farm activities and financial needs towards farming. Also, the dependency ratio in the family could force couples into farming.

Household Size of Respondents: Household size means the number of persons that contribute to the income of the household and also feed from the same source in the family. The result from the survey in Table 1 showed that 44% of the respondents had a household size of between 1-5, 48% had 6 to 10 members while 7% had 11 to 15 and 1% had over 16 persons in the household. Also, the mean house hold is 6. This indicates that majority (48%) of the farmers had a fairly large household which could probably supply farm labour. [22], said household are characterized by high number of members with high dependency ratio in Nigeria. This is due

to the needs for more hands that constitute the labour on the farm.

Years of Farming Experience: The distribution of farmers based on farming experience on table1 showed that 32 respondents had 11-20 years of farming experience. The mean years of farming experience is 15 years. This indicate that majority of the farmers had a reasonable years of farming experience. These assist farmers in averting unnecessary risk which could lead to achieving better productivity.

Input Support to Fadama III Beneficiaries Based on FUGs: The input support to beneficiaries in the study area depends on the type of enterprise or sub project of the farmers. Table 2 shows the type of input supplied to beneficiaries in the five FUGs. Inorganic fertilizers and agro chemicals was provided to maize/potato and vegetable farmers whereas birds, feeds and drugs was supplied to broiler farmers while pig farmers were provided with piglets and feeds. Meanwhile assets like water pumps, rain boots, hand gloves was provided to Han-TI-Hyau FUG while Fut-Rey Fadama and Tof-Rah Bum fua who were also involved

in crop farming had none. However this could be attributed to inadequate payment of counterpart funds although, Memorandum of Understanding on land was signed by all FUGs involved in land cultivation.

Similarly, livestock farmers had drinkers, feeders, stoves and pigpen for broilers and pig farmers respectively. Also vulnerable groups like the unemployed youths constituted two of the groups and women who constituted one group were also involved in Fadama III activities in the study area. The FUGs had varied household number ranging from 15 – 20 members.

Also the cost implication for the various enterprises differs. The highest cost of sub project is that of Han-Ti-Hayau maize and Irish potato costing ₦467,500.00 while the least cost is ₦361,690.00 of Kawas broiler production enterprise. The overall cost of production was N2,145,208.00 only. This amount is actually inadequate if the farmers were to be assisted meaningfully, considering the numbers of households involve. On the average this showed that all the counterpart funds contributed to each member in these FUGs amounted to ₦29,346.41 only [24].

Table 2: Distribution of Inputs Support to Fadama III Beneficiaries Based on FUGs

S/No.	Name of FUG	Sub project	Details of Enterprise		Member Ship	Cost of Sub-project ₦	Vulnerable groups
			Inputs	Assets			
1	Han-Ti-Hyau	Maize and Irish Potato	Fertilizers agrochemicals	Water pump, rain boat, hand gloves and mask MOU on land signed	15	467,500.00	
2.	Kawas	Broiler Production Farmers	Birds (40), Feeds Drugs	Drinkers, feeders, stove	15	361,690.00	(Youths)
3.	Anusun	Pig Production	Piglets, feeds	Pig pen	10	416,518.00	(Youths)
4.	Fut-Rey Fadama	Vegetable farmers (cabbage/tomatoes and peas)	Fertilizers and Agro chem.	MOU on land signed	18	449,750.00	
5.	Tof-Rah Bum-Fua	Maize/Irish Potato	Fertilizers Agro chem	MOU on land signed	15	449,750.00	
Total					73	2,145,208.00	

Source: Field survey, 2015

Sample of Fadama III participant Enterprise Groups and Non-participant Enterprise Groups: The different sampled Fadama III enterprise groups for participants and non-participants are presented in Table 3. The study for the Fadama III FUGs reveals that about 78% of the sampled FUGs were engaged in crop farming. Maize and Potato enterprise groups (FUGs) dominate the crop category with

about 56% while in the livestock category, pig enterprise group (FUGs) has 16%. In the same vein maize and potato has about 54% of the non Fadama III enterprise group while pig farmers in the livestock categories have 10% respectively. Poultry farming seem to be unpopular in the study area as very few farmers engaged in this enterprise.

Table 3: Distribution of Respondents by Enterprise Groups for Beneficiaries and Non-beneficiaries

Enterprise	Fadama III beneficiaries		Fadama III non-beneficiaries	
	Frequency	Percentage	Frequency	Percentage
Crop farmers				
Maize and potato	28	56	27	54
Vegetable farmers	11	22	16	32
Livestock farmers				
Pig farmers	8	16	5	10
Poultry farmers	3	6	12	4
Total	50	100	50	100

Source: Field survey, 2015

Income Level of Beneficiary and Non-beneficiary households before the implementation of Fadama III Project: Table 4 expresses the different income levels of both beneficiaries and non-beneficiaries of the Fadama III project. Findings in the data generated indicate that the average per capita income of the Fadama III user households before the implementation of the project in the state was ₦49,724.00 [24]. The income range of different households prior to Fadama III project is shown in Table 4. About 66% of the respondents in the beneficiary groups had less than N50,000 before the implementation of the project, where

only 1 of the respondent household (2%) had income level of between N251 to N300,000.00. This information actually corresponds with the best line income of participating households as published by PSFCO.

Comparatively, 62% of the non-beneficiaries are within the income range of less than N50,000.00 while the highest income was between N251 and ₦300,000.00 only owned by 2% of the population.

Table 4: Income Level Of Respondent Households Before The Implementation Of Fadama III Project

Level of Income	Fadama III beneficiaries		Fadama III non-beneficiaries	
	Frequency	Percentage	Frequency	Percentage
Less than N50,000	33	66	31	62
₦51,- 100,000	13	26	11	22
₦101 – 251, 000.	1	2	4	8
₦151 – 200,000	2	4	3	6
₦201 – 250,000	-	-	-	-
₦251 – 300,000	1	2	1	2
301,000 and above	-	-	-	-
Total	50	100	50	100

Source: Field survey, 2015

Income Level of Fadama III Enterprise Groups and Non-Enterprise Groups before Project Implementation:

The findings indicated that the average per capita income for beneficiary households prior to project implement was ₦61,020.00 while that of the non-beneficiary households was ₦63,840.00 against the baseline survey income of ₦49,724 in the state. However, on

enterprise basis, the vegetable based enterprise has the highest average income of ₦100,454.55 for the beneficiaries and ₦66,437.50 for the non-beneficiary groups. The poultry subsector followed with an average income of ₦123,333.33 for the beneficiary and ₦142,000.00 for the no-beneficiary households (Table 5), before the project implementation of Fadama III.

Table 5: Distribution Of Fadama III Enterprise Groups And Non-Enterprise Groups According To Income Level Before Project Implementation

Enterprise Category FUG	Fadama III beneficiaries		Fadama III non-beneficiaries	
	Income level	Av. Income	Income level	Av. Income
Crop farmers:	₦	₦	₦	₦
Maize and potato	1,151,000.00	41,107.14	1,326,000.00	49,111.11
Vegetable farmers	1,105,000.00	100,454.55	1,063,000.00	66,437.50
Livestock farmers				
Pig farmers	425,000.00	53,125.00	519,000.00	103,800.00
Poultry farmers	370,000.00	123,333.33	284,000.00	142,000.00
Total	3,051,000	61,020.00	3,192,000	63,840.00

Source: Field survey, 2015

Income level of Fadama III Enterprise Groups after Project Implementation:

The impact of Fadama III project on household income (Table 6) shows that there was an increase in total value from ₦3,051,000.00 to ₦4,208,000.00 for beneficiary households and from ₦3,192,000.00 to ₦3,615,000.00 for non-beneficiary household respectively after the project. This is also in line

with the study conducted by [25] on fadama II beneficiaries in Adamawa State and the findings showed that the income of the beneficiaries rose from N187,559.12 to N323,631.69. This represent an increase of N136,072.57 which represent about 72.55%. On the average, the real income of Fadama III beneficiaries increased from ₦61,020.00 to ₦84,100.00 as a result of participation in the project.

Table 6: Distribution Of Fadama III Enterprise Groups And Non-Enterprise Group According To Income Level After Project Implementation

Enterprise Category FUG	Fadama III Beneficiaries		Fadama III non-beneficiaries	
	Income Level (₦)	Av income	Income Level (₦)	Av Income
Crop farmers				
Maize and potato	1,829,000.00	65,321.43	1,584,000.00	58,666.67
Vegetable farmers	1,428,000.00	129,818.18	1,092,000.00	68,250.00
Livestock farmers				
Pig farmers	426,000.00	53,250.00	426,000.00	85,200.00
Poultry farmers	525,000.00	175,000.00	513,000.00	256,500.00
Total	4,208,000.00	84,160.00	3,615,000.00	72,300.00

Source: Field survey, 2015

The Outcome measures of Fadama III beneficiaries and non-beneficiaries based on the Double Different (DD)

Estimator: This compares changes in outcome measures between the Fadama III beneficiaries and non-Fadama III beneficiaries. From the computation, the values provided showed an increase in income of about seven hundred and thirty four thousand naira only (₦734,000.00) netting out the impact on beneficiaries. The percentage rise in income of beneficiaries was about 27.49% as against 11.7% rise in income of non-beneficiary households. The result indicates a significant difference in the income of Fadama III beneficiaries and non-beneficiaries.

The outcome measures of Fadama III beneficiaries and non-beneficiaries based on the Double Difference (DD)

Estimator.

$$DD = (Y_{p1} = Y_{p0}) - (Y_{n1} = Y_{n0})$$

Where:

$$\begin{aligned} & \text{₦4,208,000} & 1 \\ = & 0.27495 \times 100 \\ = & \underline{27.49\%} \end{aligned}$$

Challenges posed by Fadama III Programme: Some of the problems encountered by the respondents include the following:

- a) Most of the asset supplied could not stand the test of time as they break down soon after they are supplied contractors should endeavor to supply quality materials.
- b) Again, the high cost of fertilizer is another aspect of serious concern as well as the prevalence of pest and diseases. These causes serious havoc on the farms even before the produce are harvest.
- c) The late supply of inputs delay farmers from planting their crop in good time thereby exceeding into periods of excessive rainfall leading to crop devastation and thereby low consequently.
- d) Lack of good agricultural market and transport facilities for the disposal of these produce leads to price fluctuation and reduced profit.
- e) Inadequate and poor communication network is another problem encountered by some of the respondent,

CONCLUSION AND RECOMMENDATIONS

The socioeconomic characteristics of respondents revealed that the male gender dominated Fadama activities in the study area. Although, this does not mean that women participate less in farming activities. It could be due to the usual dominance of men in certain public functions as in politics. The mean age bracket of farmers is 41 years. This indicates that most of the farmers are still in their active years. This could be due to the inadequacies in securing white collar jobs by the teeming youths. The findings also revealed that 96% of the population has a kind of formal education. This showed that the campaign against illiteracy

$$\begin{aligned} Y_{p1} &= \text{Outcome (e.g. income) of beneficiaries after the project implementation (₦4,208,000.00).} \\ Y_{p0} &= \text{Outcome of beneficiaries before the project implementation (₦3,051,000.00).} \\ Y_{n1} &= \text{Outcome of Non-beneficiaries after the project implementation (₦3,615,000.00).} \\ Y_{n0} &= \text{Outcome of non-beneficiaries before the project implementation (₦3,192,000.00).} \\ DD &= (\text{₦4,208,000} - \text{₦3,051,000.00}) - (\text{₦3,615,000} - \text{₦3,192,000.00}) \\ &= (\text{₦1,157,000.00}) - (\text{₦423,000.00}) \\ &= \text{₦734,000.00} \end{aligned}$$

Percentage increase in beneficiaries' income

$$\begin{aligned} &= \frac{Y_{p1} - Y_{p0}}{Y_{p1}} \times \frac{100}{1} \\ &= \frac{\text{₦4,208,000} - \text{₦3,051,000}}{\text{₦4,208,000}} \times \frac{100}{1} \\ &= \frac{\text{₦1,157,000}}{\text{₦4,208,000}} \times 100 \end{aligned}$$

is becoming effective and people are gradually responding towards agriculture as a means of occupation. About 79% of the participants are involved in other activities to supplement farming. This could be that total dependence on farming alone cannot make ends meet due to inadequate income involved in farming alone as an occupation. Similarly, the study revealed that about 70% of the farmers were married compared to singles persons. Couples could be forced to farm due to high depending ratio and to meet the food requirements of the family. The household size of respondents reflected a fairly large family size with an average of six (6) people per household. This shows that the campaign for family planning is yet to be very effective in this area. This might force the government to enact policy that might enable people to cut down their family sizes. The mean years of farming experience among respondents is 15 years. Such lengthy period can assist farmers in averting risk and uncertainty for better outputs. Based on the findings of the study, the programme made appreciable impact on the average income of Fadama III user households based on their different enterprise activities. It has also been able to determine the proportion of the Fadama User households attaining the observed average income, the real income of Fadama III beneficiaries increased by about 27.49% (from ₦61,020 to ₦84,160.00) as a result of participation in the project.

Recommendations

1. Government allows the continuity of the project beyond the government that formulated it. As is the practice most especially in Nigeria, successive government policies of the Federal Government is always inimical to long term investment in agriculture. Thus, it is important if the programme is allowed to progress. The government should ensure that service providers execute project to specification. Assets supplied should be of standard quality to avoid breakdown soon after they are supplied.
2. There should be adequate awareness of the programme for increased participation by other farmers most especially at the local level. More extension workers should be trained

to advocate the programme even in mosques and churches to give enough coverage. This will not only increase the income of participants but facilitate the acquisition of the community owned rural infrastructures.

3. The supply of inputs should also be carried out on good times, as is the complaint of most respondents. This should be planned ahead of time to meet the expectation of farmers since activities were carried out both in the rainy and dry seasons.

4. Government should also make available better service providers for the disposal of the outputs. Most farmers sold their produce at very low prices due to the absence of adequate markets and storage facilities. If the existing marketing board can be strengthened and made more responsible to provide better services for the farmers, their produce will not be constantly sold on giveaway prices. Also, the provision of processing facilities for these produce will go a long way in mopping up the excess produce.

5. All the respondent complaints of pest and diseases as the major problems confronting farming activities. The government in partnership with NGOs should sponsor researchers to look into the causes and how to cope the occurrence of these ointments which are major hindrance to farming activities in the study area.

REFERENCES

- [1]. Chirwa, E; Mohome, M. (2001). Agricultural growth and poverty in Rural Malawi, www.gdn.int./:Ephraim&Marriam.
- [2]. Simom, T. Penda and Benjamin C. Asogwa (2011). Efficiency and Income Among the Rural Farmers in Nigeria. *J. Hum. Ecol.* 35(3):173 - 179
- [3]. Penda, S. T and Asogwa, B.C. (2011) Efficiency and income among the rural farmers in Nigeria. Department of Agricultural Economics, University of Agriculture Makurdi Benue State, Nigeria.
- [4]. Chirwa, E. W. (2005). Macro-economic policies and poverty Reduction in Malawi IMF University of Malawi, Chancellor College. Version: January 2005. www.imf.org/.../chirwa.pdf/
- [5]. Desai, R. G. (2001). Agricultural economics (Models, problems and policy issues)Himalaya Publishing House.
- [6]. World Bank (1996). Nigeria: Poverty in the midst of plenty. The challenge of growth with inclusion. A World Bank Poverty Assessment, Population and Human Resources Division Report No. 14733 – UNI, Washington, D. C. the World Bank
- [7]. National Fadama Coordination office (2012). Federal Ministry of Agriculture and Rural Development. Third National Fadama Development Project
- [8]. African Development Fund (ADF, 2003). A republic of Nigeria Fadama Development Project Appraisal Report in agriculture.
- [9]. The Nigeria Policy on Agriculture, (2000). Federal Ministry of Agriculture and Rural Development.
- [10]. Baba, K. M and Singh, B. R (1998). Sustainable Development of Fadama Lands in Northern Nigeria. A Review of the Potentials and Challenges Nigeria. *Journal of Rural Sociology*.
- [11]. Akinbile, L: A. Oladoja M.A; Awoniyi F. M and Adisa B. O. (2006). Effects of Community Participation on Perception of Sustainability of Rural Water Projects in Oyun Local Government Area of Kwara State. Nigeria. *Journal of Food Agriculture and Environment* 4 (3,4) Pp 257 – 261. www.worldfood.net.
- [12]. Alabi, J. O. (1996) Evaluation Agriculture and Rural Development programme in Nigeria. A study on REDA. Obafemi Awolowo University, Ile-Ife.
- [13]. Ehui, S, K. Tsigas, Marinos EW (2009). The role of agriculture in Nigeria’s economic growth. A general equilibrium analysis.
- [14]. Mallam, G. (1994). ABC of Agricultural Development (unpunished research)
- [15]. Akinlade, O.S.(1992). Corporate strategy for agricultural and rural development in Nigeria. Shyraden Nigeria Ltd Pp 1 – 9.
- [16]. Emmanuel O (1998). Political decisions in the Nigeria agricultural industry, Tamaz Publishing Company Limited 1st Edition Pp 37 – 42.
- [17]. National Population Commission (NPC, 2006). Estimated population Figures. National Population Commission of Nigeria , Abuja
- [18]. Duflo, E., Mulainathan, S., and Bertrand, M. (2004) How much should we trust difference in difference estimates/ *Quarterly Journal of Economic*, 119 (1): 249 – 275.
- [19]. Ravalion, M. (2006) Evaluation Anti-Poverty Programme Policy Research Working Papers. No. 3625, World Bank Washington D. C.
- [20]. Philip, D. E. Nkonya, J. Penda., and O. A. Oni (2009). Constraints to Increasing Agricultural Productivity in Nigeria. A Review Nigeria Strategy Support Programme (NSSP) Background Paper 6. International Food Policy Research Institute, Washington D.C.
- [21]. Ike, P.C. (2012). An analysis of the impact of Fadama III project on poverty alleviation in Delta State, Nigeria. *Asian Journal of Agricultural Science* 4 (2). 158 – 164, Maxwell Scientific Organization
- [22]. Olaolu, M. O., Akinagbe, O. M., and Agber, T.(2013). The Impact of National Fadama Development Project Phase II on poverty and food security among rice farming beneficiaries in Kogi State, Nigeria. *American Journal of Research Communication.* , 1, 280 - 295
- [23]. A. A. Girei, and B. Dire. (2013). Impact of National Fadama II Project on the Socioeconomic Characteristics of Crop Farmers in Adamawa State, Nigeria. *International Journal of Innovative Agriculture & Biology Research.* 1 (2):31- 38
- [24]. Plateau State Fadama Coordination Office (PSFCO, 2012) Progress Report of Plateau State Fadama

Coordination Office (SFCO) 2009 -2012: Pp 1 –
94.
[25]. Girei, A. A & Galadima, O. E. (2016). Understanding
Household Income and Expenditure of

Beneficiaries of Fadama II Project in Adamawa
State, Nigeria. *International Journal of Innovative
Agriculture & Biology Research* 4(3): 39 - 44