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MEASURING THE EFFECTS OF PUBLIC POLICY ON FOOD PRODUCTION: THE CASE OF FADAMA III RICE PRODUCTION INTERVENTION IN ANAMBRA STATE, NIGERIA

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ABSTRACT: *This work measured the effects of public policy on food production with evaluating the Fadama III rice production intervention in Anambra State. The inability of communities to come to terms with the operational modules of the project which requires them to contribute cash to the cost of productive resources they will use and governments at all levels' failure to pay their cash counterpart contribution had deterred effective realization of the project's objective. The study estimated annual incomes and productive resources used by the farmers before and after joining the project and identified constraints to the realization of project objectives. Descriptive statistics such as frequency counts, means and percentages, were used to analyze data on socio-economic characteristics of the respondents, their incomes and constraints to effective realization of the project objectives while multiple regression model using the ordinary least squares (OLS) approach was used to determine the influence of socio-economic characteristics of the farmers on their income before and after joining the project. Hypotheses were tested using t-statistic in Two-Sample T-test. Chow-statistic was used to test for differences in the coefficients of the regression variables. Findings indicated that the farmers realized incomes of ₦11,982,200 or 37.98% of total income and ₦50,164,260 or 48.02% from rice before and after joining the project respectively. Mean incomes and productive resources of ₦328,619.11 & ₦58,380.86; and ₦1,088,278.16 & ₦249,309.90 were respectively estimated for farmers before and after joining the project. There were significant differences between incomes and productive resources of the farmers before and after joining the project implying goodness of the project. The crop farmers' annual incomes before and after joining the project were significantly determined by distance to the market, farm size, extension visits and value of productive resources. Irregular fund disbursement topped the list of nine constraints to effective realization of project objectives arranged in descending order of seriousness. Early and prompt release of productive resources and cash counterpart contributions to the farmers, provision of more extension agents, services and logistics for the farmers and reduction of users' cash contribution will ensure improved productivity, income and project sustainability*

KEYWORDS: Fadama III project; Income; Productive resources; Significant; Rice; Anambra State

INTRODUCTION

The Nigerian agricultural sector has continued to be characterized by increasing reduction in production and productivity thereby limiting the ability of the sector to perform its traditional role in economic development including an enhanced income for the farmers. In order to break this low productivity cycle and improve on the performance of the agricultural sector, Nigerian government over the years introduced and implemented several policies and programmes

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aimed at revamping the sector (Ajibefun and Aderinola, 2004). Nigeria has one of the world's highest economic growth rates (averaging 7.4% over the last decade), a well-developed economy, and plenty of natural resources such as oil. However, it retains a high level of poverty, with 63% living below $1 per day, implying a decline in equity. Attempts in the past aimed at poverty alleviation, increase in productivity, and enhancement of farmers income, according to Henri-Ukoha, Ohajianya, Nwosu, Onyeagocha, and Nwankwo, (2011) include:

i. National Agricultural Research Projects—World Bank Assisted (1991),

ii. National Agricultural support Programme (1992),

iii. National Programme on Food Security (1999), and

iv. Presidential Initiative on Livestock and other agricultural sectors for production, processing and export (2002).

Self-sufficiency in food production based only on rainfed agriculture is difficult to achieve. This is particularly true for Nigeria. Therefore, for self-sufficiency in food production, there is need to extend the farming season beyond the rainy season through irrigated agriculture (Ajayi and Nwalieji, 2010). This is one major thrust of Fadama Projects.

The National Fadama Development Project (NFDP) is divided into three phases (Phases I, II and III). Fadama I focused mainly on crop production and largely neglected support of post production activities such as commodity processing, storage and marketing (downstream agricultural sector). The emphasis was on providing boreholes and pumps to crop farmers through simple credit arrangements aimed at boosting aggregate crop output (Nkonya, *et al*, 2008). Fadama II aimed at addressing most of the constraints of Fadama I was geared towards contributing to food security and improved rural infrastructure facilities.. It stresses the principles of non-intervention; consistency; sustainability and greater equity in access to and benefit of resources by the benefiting community.

The NFDP phase III is a follow-up on the phase II. The development objective of Fadama III is to increase the income of the users of rural land and water resources on sustainable basis. It relies on the facilitation of demand–driven investment and empowerment of local community groups and to improve productivity and land quality. The NFDP has the general goal of increasing food production in the states through expanded cultivation, using simple small-scale irrigation facilities with appropriate technologies. It was aimed at increasing the land area under cultivation by providing an all-year round cropping of marketable and high-valued crops such as cereals (maize and rice), fruits and assorted vegetables. The increase in the total population of these crops annually would increase the incomes of the farmers and raise their standard of living. Furthermore, NFDP would serve as an insurance against crop failure as a result of environmental hazards. The disturbing demand-supply gap for agricultural products was meant to be narrowed and relative price stability ensured over time through Fadama Projets (Anambra State Agricultural Development Programme (ASADP), 1995). In all, the socioeconomic life of the farmers would be improved.

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ANAMBRA STATE FADAMA III CONTEXT

Fadama III Project, a World Bank assisted project, is a comprehensive five-year action programme developed by the then Federal Ministry of Agriculture and Water Resources (FMAWR) in collaboration with the Federal Ministry of Environment (FME) and other federal and state government ministries, local governments and key stakeholders (donors, private operators, NGOs). The Project which is anchored on community-driven development (CDD) approach will be implemented over five years beginning from July 2008 and terminating in December 2013. It is one of such projects enunciated by the Federal government of Nigeria predicated on the development of the rural areas for the reduction of poverty, unemployment and inequality. It was established to ensure all year round production of crops in all the states of the federation through the exploitation of shallow aquifers and surface water potentials in each state

The word "Fadama" is an Hausa name for irrigable land, usually low-lying, and flood plain areas underlined by shallow aquifers found along Nigeria's river system (Echeme and Nwachukwu, 2010). According to Nwachukwu, Agwu, Ezeh, Mbanasor, Onyenweaku, and Kamalu, (2009), Fadama also refers to a seasonally flooded area used for farming during the dry season. When Fadama spread out over a large area, they are often called 'wetlands' (Blench and Ingawa, 2004 and Nkonya, Philip, Mogues, Pander, Yahaya, Adebowale, Arokoyo, and Kato, (2008). Wetlands are recognized by the Ramsar 3 Convention of 1971, according to Anon (2004), as areas of marsh, fen, peat land or water, whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish or salt, including areas of marine water the depth of which at low tide does not exceed six meters. The Fadama Project adopts community-driven development approach such that the benefitting groups – Fadama Users Groups (FUG) have the opportunity of choosing adoptable activity that can attract the support of the World Bank according to Echeme and Nwachukwu, (2010).

According to United Nations (2010) the Fadama III Project development objective is to increase the income of users of rural land and water resources on a sustainable basis in order to reduce rural poverty, increase food security as well as contribute to the achievement of the Millennium Development Goals (MDGs). Its Community Driven Development (CDD) approach is meant to concede project initiation, planning and implementation to the benefiting communities with the assistance of facilitators. Local communities, under the umbrella of Fadama Community Associations (FCAs) and Fadama User Groups (FUGs), oversee the design and implementation of the project and are empowered through skills and capacity-building to improve their livelihoods by increasing income generating activities.

One major thrust of Fadama Projects is to extend the farming season beyond the rainy season through irrigated agriculture (Ajayi and Nwalieji, 2010). The NFDP has the general goal of increasing food production in the states through expanded cultivation, using simple small-scale irrigation facilities with appropriate technologies. It was aimed at increasing the land area under cultivation by providing an all-year round cropping of marketable and high-valued crops such as cereals (maize and rice). The increase in the total population of these crops annually would increase the incomes of the farmers and raise their standard of living. Furthermore, NFDP would serve as an insurance against crop failure as a result of environmental hazards. The disturbing demand-supply gap for agricultural products was meant to be narrowed and relative price stability ensured over time (Anambra State Agricultural Development Programme (ASADP), 1995). In all, the socioeconomic life of the farmers would be improved. The

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strategies for achieving the above objectives involved the delivery of several inputs and services that would generate desired outputs. These included:

(i) development of requisite infrastructure such as access roads, culverts, tubewells and pumps, within the fadama areas in the state;

(ii) provision of marketing/storage facilities such as storage sheds; and

(iii) organizing farmers into Fadama Users Associations (FUAs) for irrigation management, better access to credit, cost recovery and training on improved technologies (Ajayi and Nwalieji, 2010).

This study was carried out in Anambra State of Nigeria. Anambra State was created in 1991. Its name is an anglicized version of the original 'Oma Mbala', the name of the river now known as Anambra River which the state is named after. The Capital and the Seat of Government is Awka. Onitsha and Nnewi are the biggest commercial and industrial cities respectively. The State is bounded in the west by Delta State, in the south by Imo and Rivers States; in the east by Enugu State and Kogi State to the north. The dominant ethnic group is Igbo (98%) followed by Igala (2%), (Canback Global, 2008). Wikipedia Organisation (2013) documented that Anambra occupies an area of 4,844 km^2 (1,870.3 sq mi) and ranks 10^{th} in population in Nigeria with a population of 4,055,048 given by the 2006 census. With a population density of 837.1/km^2 (2,168.2/sq mi), it ranks second to Lagos State. The State has 21 Local Government Areas and politically shared equal into three senatorial zones. All the Local Government Areas in the state are participating in the project with the exception of Onitsha South LGA.

Anambra State is predominantly occupied by the Igbo ethnic group of Nigeria, who by nature are farmers, fishermen, craftsmen and traders. It has an almost 100 percent arable soil. Among crops grown by farmers in the state are yam, palm produce, rice, cassava, cocoyam, vegetables, and different varieties of fruit trees among others. (Anambra State Ministry of Economic Development, 2010). The State experiences dry season from late October to early May and has at least six dry months in the year. The vegetation consists of rainforest. Other parts consist of wooden savannah and grasslands. The State is drained by five major rivers and their tributaries. These are the River Niger, Anambra River, Mamu/Ezu River, Idemili River and River Ulasi. In addition to these, there are smaller perennial streams like the Oyi, Nkisi, and Obizi. In-land valley ponds and lakes occur, with the Agulu Lake draining a collection of towns in the state (Ajayi and Nwalieji, 2010). These drainages make the state very conducive for fadama activities.

THEORETICAL FRAMEWORK

This work was based on Collective Action Theory. Collective action is traditionally defined as any action aiming at improving the group's conditions (such as status or power), which is enacted by a representative of the group (Wright, Taylor, and Moghaddam, 1990). Tajfel and Turner (1979) posited that people strive to achieve and maintain positive social identities associated with their group memberships.

Pandolfelli, Meinzen-Dick, and Dohrn (2007), saw collective action as both the process by which voluntary institutions are created and maintained and the groups that decide to act together. Collective action plays a vital role in many people's lives, through such areas as

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income generation, risk reduction, public service provision, and the management of natural resources. Integrating both women and men into collective action can lead to greater group effectiveness. In many instances, the gender composition of groups is an important determinant of effective collective action, especially for natural resource management in two key dimensions: (i) the ability of groups to meet their immediate purposes, whether that purpose is the management of a natural-resource or the disbursement of funds to members of a burial group, and (ii) the process by which the group works to meet that purpose. Specific measures of effectiveness might include tangible indicators such as economic returns to group members, compliance with rules, transparency and accountability in managing funds, or the incidence and severity of conflicts, as well as less tangible indicators, such as members' satisfaction with the group (Pandolfelli, Meinzen-Dick, and Dohrn,2007). This conforms with the co-operative principles of open membership and gender equality. Marshall (1988) suggests that collective action is an action taken by a group (either directly or on its behalf through an organization) in pursuit of member's perceived shared interest. He went on in his work to maintain that collective action requires involvement of a group of people; share of interest within the group; common action which works in the pursuit of the shared interest and voluntary action to distinguish it from hired labour. Collective action is also seen as a voluntary action taken by a group of people to achieve common interest. Co-operative, as voluntary association of independent individuals who come together in order to solve their socio-economic problems, requires collective action to succeed. Okechukwu (2001) stated that all known definitions of co-operative tend to highlight the following about co-operatives: co-operation is a form of organization of people; the people are rational beings; they are together on equality basis; are there for the promotion of socio-economic interest of themselves; and are democratically managed.

Based on the premise above, the theory of collective action becomes apt in this work especially as Fadama Users' Groups are organized, incorporated and managed as co-operative organisations. This is buttressed more by Chavez (2003) who opined that collective theory definition, principles and practice directly or indirectly relate to co-operative seven internationally recognized principles of voluntary and open membership, member economic participation; co-operation among co-operatives, concern for community etc. According to Dick, Gregorio, and McCarthy (2004) collective action theory is a theory that is very useful in agriculture, rural resource management, and rural development programmes. These are the hallmark of Fadama Users Groups.

MATERIALS AND METHODS

This study centered on Fadama User Groups (FUGs) crop farmer-members within Anambra State of Nigeria. It was aimed at determining if their performance was in tune with the objective of Fadama III Project of increasing the income of the member-farmers sustainably by direct delivery of productive resources to them. The study tried to determine if there is any significant difference between the fortunes of rice farmer-members of the FUGs before and after joining the scheme with respect to their income and values of productive resources used as well as the effects of their socio-economic characteristics on their incomes.

The population for this study consisted of all the FUG crop farmer-members within the 117 communities in Anambra State spread through the four Agricultural Zones (Awka, Aguata, Onitsha and Anambra) of the State. A multistage and random sampling method were adopted

ISSN 2057-2611(Print), ISSN 2057-262X(Online)

to select 2 agricultural zones in the first stage, in the second stage, 2 LGAs were selected giving a total of 4 LGAs within the State. In the third stage, 4 Fadama User Groups (FUGs) were selected from each of the selected LGAs to arrive at a total of 16 FUGs. In the fourth stage, 6 crop-farmers were selected from each FUG to give a total of 96 crop farmer-members for the study. This constituted the final sample size for the study.

Primary data were collected from crop farmer-members of the FUGs using well structured and pre-tested questionnaires, scheduled interviews and panel discussions. Primary data were collected on socio-economic characteristics of the respondents, their income, access to productive resources and constraints to effective realization of the project objectives. Data on constraints were collected by means of a 5-point Likert Scale. Members of the FUGs responded to any of the five response ratings of ***Strongly Agree*** (4), ***Agree*** (3); ***Disagree*** (2); ***Strongly Disagree*** (1) and ***Indifferent*** (0);

Descriptive statistics such as frequency counts, means and percentages, were used to analyze data on socio-economic characteristics of the respondents, their incomes and constraints to effective realization of the project objectives while multiple regression model using the ordinary least squares (OLS) approach was used to determine the influence of socio-economic characteristics of the farmers on their income before and after joining the project.

The multiple regression model is implicitly specified as follows:

INC = f(EDU, AGE, ASI, DTM, FFS, FAS, ETV, GEN, EXP, PDR) + e

Where:

INC = Income generated by the FUG crop farmers;

EDU = Education level (years);

AGE = Age of the farmer (years);

ASI = Availability of special infrastructure (dummy: available = 1; otherwise = 0);

DTM = Distance to market (kilometers);

FFS = Farmer's farm size (hectares);

FAS = Family size (number);

ETV = Extension visit/contacts (number);

GEN = Gender (Male = 1; Female = 2);

EXP = Farmer's farming experience (years); and

PDR = Productive resources (available = 1; otherwise = 2)

Four functional forms of the regression model were tried, namely, linear, exponential, semi-log, and double-log. Output of the form with the highest value of coefficient of multiple determination (R^2), highest number of significant variables and F-statistics value were selected as the lead equation. The explicit versions of the four functional forms are as follows:

ISSN 2057-2611(Print), ISSN 2057-262X(Online)

Linear: $INC = b_0 + b_1EDU + b_2AGE + b_3ASI + b_4DTM + b_5FFS + b_6FAS + b_7ETV + b_8GEN + b_9EXP + b_{10}PDR + e_i$

Exponential: $InINC = b_0 + b_1EDU + b_2AGE + b_3ASI + b_4DTM + b_5FFS + b_6FAS + b_7ETV + b_8GEN + b_9EXP + b_{10}PDR + e_i$

Semi-log: $INC = b_0 + b_1InEDU + b_2InAGE + b_3InASI + b_4InDTM + b_5InFFS + b_6InFAS + b_7InETV + b_8InGEN + b_9InEXP + b_{10}InPDR + e_i$

Double-log: $InINC = b_0 + b_1InEDU + b_2InAGE + b_3InASI + b_4InDTM + b_5InFFS + b_6InFAS + b_7InETV + b_8InGEN + b_9InEXP + b_{10}InPDR + e_i$

The b_0 and the b_is are the parameters to be estimated and the e_i is the error term meant to capture errors arising from mistakes in specifications, exclusions, inclusions, data collection. In is the logarithm to base 10. The acronyms – INC, EDU, AGE, ASI, DTM, FFS, FAS, ETV, GEN, EXP, PDR- are as earlier defined.

RESULTS AND DISCUSSIONS

Socio-economic characteristics of the FUG crop-farmers

A summary of the socio-economic characteristics of the crop farmers is shown in Table 1. The results reveal that majority of the crop farmers (51.04%) were women. The dominance of women could be a reflection of the males' preference to trading and white-collar jobs in the State. The average age of the farmers was 47years. The fact that 87.5% of the respondents fell within this working age bracket showed prospects for greater productivity which the Fadama III project tends to achieve. The study revealed that 98.96% of the respondents were married and an average family size of 6 persons. Large household sizes have been noted to have correlation with food insecurity and poverty especially when the household head is engaged in agriculture as the main source of livelihood and income (Ike and Uzokwe, 2011). On the other hand large family size will add to the family labour and reduce production cost. The average number of education years attained by the farmers was 7, implying a post primary education. Good education enhances managerial, organizational effectiveness and efficiency of the farmer. These attributes will be manifested in his productivity and net income. The average farming experience was 22 years with an average farm size of 1.4 hectares in the State. The study also revealed that an average of distance from the farmers' farm site to the market to be 5 kilometers.

Income of the Farmers before and after Joining the Fadama Project

Table 2 presents the result of the estimated income of the farmers before and after joining the project. The study revealed that before joining the project cassava earned the farmers highest income with 41.56% of the total income, followed by rice with 37.98%, yam had 15.73% to come third and plantain contributed the least with 0.67%. The estimated income of the farmers after joining the project revealed that rice topped the list this time with ₦50, 164,260 (48.02%) overtaking cassava which gave the farmers highest income before joining the project. This improved position of rice in Anambra State could be in response to Federal Government's policy on increased local production of rice to reduce dependence on import. Rice was followed by cassava with ₦37,110,783 (35.52%), yams with ₦12,020,000 (11.51%) and the least was

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plantain with ₦232,400 (0.22%). Income realized by the farmers from rice production significantly increased from ₦11,982,200 pre-project to ₦50,164,260 after joining the project. This implied that the FUG crop farmers properly utilized the productive resources made available to them to enhance their income especially in rice production. The study also revealed that the crop farmers realized estimated mean income of ₦328,619.11 and ₦1,088,278.16 before and after joining the project respectively. This impression was further substantiated with the result of the test of hypothesis, there is no statistically significant difference between mean incomes of the FUG crop farmers before and after joining the project (Table 3) which indicated a remarkable difference between the mean incomes levels of these crop farmers before and after joining the Fadama project at 5% level..

Estimated influence of socio-economic characteristics of the FUG Crop Farmers on their annual incomes before and after joining the project

The multiple regression analysis was used to establish the influence of socio-economic factors of the farmers on their annual incomes. Four functional forms (Linear, exponential, semi-log and double-log) of the regression model were fitted with the data and tried using the MANITAB statistical software. It could be seen from Tables 4 and 5 that the output of the linear form gave the best result in terms of number, sizes and signs of significant parameter estimates as well as R^2, R^2 (adjusted), F-statistic and Durbin-Watson statistic. It was therefore adopted as the lead equation. The regression equation is stated as:

INC = 165167 -786EDU + 993AGE -13223ASI + 3472DTM + 40992FFS -4149FAS + 13939ETV -21155GEN + 321EXP + 85850PDR + e^i

A total of 10 regressors were included in the model and four of them, distance to the market (DTM), farmers' farm size (FFS), extension visits (ETV) and productive resources (PDR) were statistically significant. Distance to the market was significant at 1% level of probability at both before and after joining the Fadama project. This factor is an important determinant of the income of any farmer in that should there be no market for his products, the products will either spoil or he will be forced to give them away at any offer without an opportunity to optimize his income from the sales. Again the nearer the market the smaller the transportation cost and the higher the net income. This is probably the reason behind the construction of Fadama markets in some communities as community projects.

Farmer's farm size, extension visits and productive resources were significant at 5% level of probability. This implies that the FUG crop farmers who used more of these resources were likely to realize more income. This result agrees with Kern and Paulson (2011) who postulated that profit does vary with farm size as larger farms may be able to more efficiently use larger equipment complements or obtain discounts by buying larger volumes of inputs resulting in lower capital and/or variable input costs per acre.

Improved farming technologies such as high yield crop varieties, chemical fertilizers, and irrigation techniques have been central in raising yields, however, farmers have been much slower in adopting these new methods because of lack of information regarding how to apply the improved inputs (Betz, 2007). Consequently, access to reliable information is an integral part in any farmer's ability to raise productivity. This probably explains the significance of extension visits (EVT) in this result. Application of high yield crops, good irrigation and suitable agrochemicals will increase the productivity of any farmer; tractorization will save

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time and cost cumulating in improved income. This underlines why in this result, productive resources (PDR) was significant.

The R^2 values of 68.7% and 74.6% before and after joining the project respectively showed that 68.7% and 74.6% of the variations in the income levels were explained by the explanatory variables and buttressed by R^2(adj) of 64.7% and 70.4% for before and after joining the Fadama project respectively. It also showed an F- statistic of 4.79 and 8.09 respectively significant at 5% level implying the goodness of fit of the model and confirmed by Durbin-Watson statistic of 1.78 and 1.86 respectively which signify the absence of auto-correlation among observations of the independent variables. The result led to the rejection of the null hypothesis that the socio-economic characteristics of the FUG crop farmers have no statistical and significant effects on their incomes and the acceptance of the alternative hypothesis which is that socio-economic characteristics of the FUG crop farmers have statistical and significant effects on the farmers income both before and after joining the Fadama Project.

Difference of the estimated variables influencing the income of the FUG crop farmers before and after joining the project

The Chow-statistic was used to test for the coefficients of the regression variables. In this work it was used to determine whether the independent variables have different impact on the crop farmers' income before and after joining the project.

$$\text{The Chow-test} = \frac{\{S_{ABP} - (S_{AP} + S_{BP})\}/ (K)}{(S_{AP} + S_{BP}) / (N_{AP} + N_{BP} - 2K)}$$

Where

S_{ABP} = Sum of squared residuals from the pooled data of the crop farmers'income regression output before and after joining the project;

S_{AP} = Sum of squared residuals from the crop farmers' income regression output after joining the project;

S_{BP} = Sum of squared residuals from the crop farmers' income regression output before joining the project;

N_{AP} = Number of observations after joining the project;

N_{BP} = Number of observations before joining the project;

K = Total number of parameters.

S_{ABP} = 3.07612

S_{AP} = 2.04844; S_{BP} = 0.8249689

N_{AP} = 96; N_{BP} = 96; K = 10

Substituting into the formula

$$= \frac{\{3.07612 - (2.04844 + 0.8249689)\} / 10}{0.01670587} = \frac{0.02027111}{(2.04844 + 0.8249689) / 172} = 1.21$$

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The Chow-statistic gave a p value of 1.21 which is greater than 0.05 at 5 percent level of significance. This shows that there is no statistical significant difference in the impact of the socio-economic variables on the income of the crop farmers before and after joining the project.

CONSTRAINTS TO PROJECT REALIZATION

Crop farmers within Anambra State posited that Fadama III Project could have recorded more successes if not for some constraints. Analysis of these constraints were done by comparing the calculated mean scores of the variables with the critical mean of 2.0 obtained using a 5-point Likert scale and presented in Table 6 were ranked in order to determine the seriousness of the constraints. The crop farmers considered irregular fund disbursement method as the greatest set back with a mean score of 3.83. The other problems were listed in a descending order with their mean scores: late release of government cash contribution 3.44; demand for users' cash contribution 3.12; non payment of beneficiary contribution 3.09; misconception of the project by benefiting communities 2.82; inadequacy of \facilitators 2.61; inadequate logistics for extension staff/officers 2.60; internal wrangling/suspicion among benefiting communities 1,56 and poor leadership/management by officers of FCAs/FUGs 1.40.

CONCLUSION

Fadama III is an applaudable intervention project for rural development, food security, improved productivity and enhanced income for farmers particularly the rice farmers in Anambra State as evidenced by significant increase in the estimated levels of income from ₦11,982,200 before the project to ₦50,164,260 after joining the project. This has satisfied one of the project's aims of sustainably increasing the incomes of Fadama resource users through effective and efficient delivery of productive resources directly to them. The project has not only been favourable to the active age population but had been reasonably gender sensitive because as much as 51.04% of the farmers in Anambra State were females.

RECOMMENDATIONS

It will be very ideal if the Project allocates its resource delivery for the production of crops in the State in order of their income yielding capabilities with rice topping the list. The State Fadama Coordination Office (SFCO) should ensure early and prompt release of productive resources to the farmers, to enable them make good use of the inputs. Governments at all levels in the State should endeavour to release their cash counterpart contributions early enough to be useful to the farmers. The SFCO with the assistance of relevant departments like co-operatives and ADP should organize seminars/workshops for the farmers to ensure efficient and effective deployment of the provided productive resources. Facilitators and desk officers who are doubling as extension officers should be encouraged to attend to the farmers promptly by providing them with essential logistics. They should mount vigorous public enlightenment campaign to disabuse their minds from seeing the funds advanced to them as their own share of the "national cake".

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REFERENCES

Ajayi, A. R and Nwalieji, A. H (2010), Impact of the Anambra State Fadama Project Phase -1 on the Socio-economic Life of the Rural Farmers. Retrieved from: http://www.krpublishers.com/02-Journals/JHE/JHE-29-0-000-10-web

Anambra State Agricultural Development Programme (ASADEP, 1995). Proposal andapplication in the national Fadama facility. Awka: ASADEP

Anambra State Ministry of Economic Development (2010), Input into Nigeria Vision 2020 Document for Anambra State. Government Printers, Awka.

Anon. (2004). What are Wetlands. Retrieved from: http:/www.ramsar.org/about - infopack - ie –htm.

Anambra State Agricultural Development Programme (ASADEP, 1995). Proposal and application in the national Fadama facility. Awka: ASADEP

Betz, M (2009). The effectiveness of agricultural extension with respect to farm size: The case of Uganda The Ohio State University, Ohio.

Blench, R. M. and.Ingawa, S. A. (2004). A Practical Guide for National Fadama Development Project II on Conflict and Management. The World Bank PCF/Government of Nigeria PCU Fadama 11, 1-19

Canback D (2008). Canback Global Income Database 2008. Somerville. Canback Dangel LLC.

Chavez, E. M. (2003). Increasing productivity of rural work. *Economic and Social Council (ECOSOC) Round Table*. New York, United Nations' Hq.

Dick, Gregorio, and McCarthy (2004). Political institutions and development: Failed expectations and renewed hopes. Massachusetts, USA Edward Elgar Publishing Ltd,

Echeme, I.I. and Nwachukwu, C.C. (2010) An investigation of Fadama 11 Project implementation in Imo State. *American Journal of Scientific and Industrial Research.* Retrieved from http/www.scihub.org/AJSIR

Ezugwu, B. W (2011). Gains and challenges of Fadama 111 in Cross River. Retrieved from: http/nigerianobservernews.com/27012011/features/features6.html

Ike, P.C. and Uzokwe, U.N (2011). Estimation of Poverty among Rural Farming Households in Delta State, Nigeria. Int. J. Agric. Food Sci. Technol., 2(1): 11-21.

Kern, M and Paulson, N (2011), Profitability and farm size on grains farms in Illinois. Retrieved from http://farmdocdaily.illinois.edu/2011/05/profitability-and-farm-size-on.html

Marshal, G (1988), A dictionary of sociology. New York, Oxford University Press.

T and Kato, E. (2008). Impacts of pro-poor Community-Driven Development Project in Nigeria. IFPRI discussion paper 00756, Washington, IFPRI,

Nwachukwu, I. N., Agwu, N.M., Ezeh, C.I., Mbanasor, J. A., Onyenweaku, C.E and Kamalu, C.E. (2009) Evaluation of Second National Fadama Project in Nigeria: A rapid policy appraisal. Retrieved from http://mpr.ub.unimuenchen.de/12914/MPRAPaper No.12914

Okechukwu, E. O. (2001). Co-operative business, principles and practice. Awka, Authors and Publishers.

Pandolfelli, L., Meinzen-Dick, R., and Dohrn, S. (2007). Gender and collective action: A conceptual framework for analysis. Collective Action Working Paper 64: 57.

Tajfel, H and Turner, J. C (1979). An integrative theory of inter-group conflict, in Austin,W. G and Worchel, S (ed) *The Social Psychology of Inter-group Relations* **(pp. 33-47)**: Monterey, CA: Brooks/Cole.

ISSN 2057-2611(Print), ISSN 2057-262X(Online)

Umebali, E.E (2008). Rural Development and Management. (MPA 736), Lagos. National Open University of Nigeria.

United Nations, (2006). "The Millennium Development Goals report, 2006" UNDP Retrieved from www.undp.org/publications/MDGReport2006.pdf

Wright, S.C., Taylor, D.M.; and Moghaddam, F.M.(1990). Responding to membership in a disadvantaged group: From acceptance to collective protest. *Journal of Personality and Social Psychology* **58**: 994–1003.

Wikipedia Organisation (2013), Anambra State. Retrieved from http://en.wikipedia.org/wiki/Anambra_State

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APPENDIX

Table 1: Socio-economic characteristics of the FUG crop farmers in Anambra State

Variables	Frequency	Percentage	Averages
Gender			
Male	47	48.96	
Female	49	51.04	
Age (years)			
20 — 39	18	18.75	
40 — 59	66	68.75	
≥ 60	12	12.50	
			47
Marital status			
Married	95	98.96	
Single	01	01.04	
Family size			
1 — 4	24	25	
5 — 9	63	65.63	
≥ 10	09	09.37	
			6
Education (years)			
0 — 6	47	48.96	
7 — 12	42	43.75	
≥ 13	07	07.29	
			7
Farming			
Experience (years)			
1 — 20	44	45.83	
21 — 40	49	51.04	
41 — 60	03	03.13	
			22
Farm size (hectares)			
0.1 — 2	80	83.33	
2.1 — 4	13	13.54	
≥ 4.1	03	03.13	
			1.4
Distance to Market (km)			
1—5	49	51.04	
6—10	15	15.63	
> 10	32	33.33	
			6

Source: Field survey 2013.

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Table 2 Estimated income of the farmers before and after joining the Fadama Project

	BEFORE		AFTER	
Variables	Amount (₦)	% of total	Amount (₦)	% of total
Rice	11,982,200	37.98	50,164,260	48.02
Yam	4,963,980	15.73	12,020,000	11.51
Maize	––	––	––	––
Cocoyam	675,000	2.14	2,431,000	2.33
Cassava	13,112,554.5	41.56	37,110,783	35.52
Plantain	215,100	0.67	232,400	0.22
Vegetable	598,600	1.90	2,516,260	2.41
Groundnut	––	––	––	––
Total	31,547,434.5	100	104,474,703	100
Mean income	328,619.11		1,088,278.16	

Source: Field survey, 2013.

Table 3: Estimated difference in means of income of farmers before and after joining the project

Variable (N= 96)	Mean	Difference between means	T	P	df
IAP	1,088,278.16				
IBP	328,619.11	759,659.05	-7.62**	0.000	94

Notes: IAP = Income after joining the project; IBP = Income before joining the project. N = Number of respondents. ** =Significant at 5% level.
Source: Field survey, 2013

Table 4: Estimated determinants of farmers' income before joining the project

Parameter	Linear	Exponential	Semi-log	Double-log
Constant	165167	3.1241	-276814	2.7132
	(1.79)	(18.32)	(-1.17)	(5.06)
EDU	-786	-0.008342	-13622	-0.0123
	(-0.20)	(-0.58)	(-1.48)	(-0.07)
AGE	993	0.001213	6756	0.0563
	(0.54)	(0.56)	(0.61)	(1.15)
ASI	-13223	-0.001679	-2667	-0.0452
	(-0.44)	(-0.42)	(-0.54)	(-0.31)
DTM	3472	0.00822	3365	0.08996
	(1.86)*	(0.74)	(0.56)	(1.08)
FFS	40992	0.06814	88642	0.2856
	(2.39)**	(2.05)**	(2.38)**	(2.04)**
FAS	-4149	-0.006341	-2761	-0.09888
	(-0.62)	(-0.81)	(-0.46)	(-1.13)
ETV	13939	0.009956	2448	0.2496
	(2.40)**	(2.13)**	(2.11)**	(1.87)*
GEN	-21155	-0.002113	-30176	0.03842
	(-0.93)	(-0.82)	(-1.14)	(0.32)

ISSN 2057-2611(Print), ISSN 2057-262X(Online)

EXP	321	0.002711	2746	0.0866
	(0.19)	(0.58)	(0.38)	(0.78)
PDR	85850	0.000145	8965	0.3049
	(1.89)**	(1.14)	(2.13)**	(2.11)**
R^2	68.7%	62.5%	65.3%	64.5%
R^2(adj)	64.7%	60.1%	62.7%	62.6%
F-statistic	4.79	4.12	4.23	4.13
D-W statistic	1.78	1.56	1.67	1.47

Notes: * = Significant at 1% level; ** = Significant at 5% level. Figures in ( ) are t ratios. EDU, AGE, ASI, DTM, FFS, FAS, ETV, GEN, EXP and PDR are as earlier defined. D-W statistic = Durbin-Watson statistic.
Source: Field survey 2013.

Table 5: Estimated determinants of farmers' income after joining the project

Parameter	Linear	Exponential	Semi-log	Double-log
Constant	644672	2.7812	-23614	1.9431
	(1.81)	(13.14)	(-0.98)	(4.07)
EDU	-16054	-0.00813	-13438	-0.0112
	(-1.80)	(-0.63)	(-1.25)	(-0.08)
AGE	6233	0.00213	5667	0.0449
	(1.23)	(0.55)	(0.73)	(1.13)
ASI	-10398	-0.00412	-1769	-0.0461
	(-0.12)	(-0.47)	(-0.57)	(-0.42)
DTM	9755	0.00916	2887	0.0761
	(1.98)*	(0.77)	(0.61)	(1.11)
FFS	39989	0.07116	176178	0.2671
	(2.40)**	(2.07)**	(2.09)**	(1.98)**
FAS	-15795	-0.00043	-2476	-0.0891
	(-0.85)	(-0.68)	(-0.52)	(-1.14)
ETV	8322	0.08341	23641	0.2187
	(1.83)**	(2.14)**	(2.08)**	(1.94)*
GEN	-68232	-0.00781	-33672	0.0271
	(-1.09)	(-0.69)	(-1.08)	(0.46)
EXP	-2776	0.00347	2697	0.0674
	(-0.61)	(0.64)	(0.51)	(0.83)
PDR	55461	0.00136	7729	0.1973
	(2.15)**	(1.12)	(2.11)**	(1.96)**
R^2	74,6%	68.4%	65.9%	70.7%
R^2(adj)	70.4%	64.4%	63.4%	68.2%
F-statistic	8.09	4.21	4.14	7.04
D-W statistic	1.86	1.58	1.63	1.92

Notes: * = Significant at 1% level; ** = Significant at 5% level. Figures in ( ) are t ratios. EDU, AGE, ASI, DTM, FFS, FAS, ETV, GEN, EXP and PDR are as earlier defined. D-W statistic = Durbin-Watson statistic.
Source: Field survey 2013

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Table 6: Constraints to project realization

Variable	Mean score	Rank
Irregular fund disbursement method	3.83	1st
Late release of government cash contribution	3.44	2nd
Demand for users' cash contribution	3.12	3rd
Non payment of beneficiary contribution	3.09	4th
Misconception of the project by benefiting communities	2.82	5th
Inadequacy of facilitators	2.61	6th
Inadequate logistics for facilitators/officers	2.60	7th
Internal wrangling/suspicion among benefiting communities	1,56	8th
Poor leadership/management by officers of FCAs/FUGs	1.40	9th

Source: Field survey, 2013.

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