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Government Spending on Poverty Alleviation through Co-operatives: A Case Study of Fadama III Project Crop Farmers' Co-operative Societies in IMO State (Nigeria)

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Abstract

This work evaluates government spending on poverty alleviation through co-operatives looking at crop farmers' co-operative societies of the Fadama III Project in Imo State of Nigeria. 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, as well as multiple regression model using the ordinary least squares (OLS) approach were used to analyze data obtained. 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 Mean incomes and productive resources of ₦214,281.68 and ₦464,425.21; and ₦86,568.19 and ₦281,631.62 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 policy. 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: Co-operatives; Fadama III project; Income; Imo State; Productive resources; Poverty alleviation; Significant; Sustainable

Introduction

Baratz and Grisby (1972), defined poverty as a condition involving some deprivations and adverse occurrences that are closely, but not necessarily exclusively, associated with inadequate economic resources. Edozien, (1975), views it as an inadequacy of income to support a minimum standard of living. Townsend (1979), using the concept of relative deprivation, said that individuals, families and groups in the population can be said to be in poverty when they lack the resources to obtain the types of diet, participate in the activities and have the living conditions and amenities which are customary, or at least widely encouraged or approved, in the societies in which they belong. Poverty alleviation, therefore, is best approached as an exercise in raising people's capabilities, or enhancing freedoms. The corollary of this approach to development is that empowerment – helping people in poverty to acquire the tools they need to meet their needs – is the long-term solution to poverty. This precisely was a cardinal objective of Fadama III Project.

Using poverty indicators such as literacy level, access to safe water, nutrition, infant and maternal mortality, and the number of people living on less than $1 a day, Nigeria is found to rank among the 25 poorest nations in the world below Kenya, Ghana and Zambia (World Bank, 2002). This is in spite of all the efforts and resources devoted for many years to fighting poverty by successive governments in Nigeria, with the support of richer nations and international development institutions.

Attempts in the past aimed at poverty alleviation, increase in productivity, and enhancement of farmers income, according to Henri-Ukoha, *et al* (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. These farmers have limited access to supplementary services and facilities needed to procure, transform, and deliver productive resources to improve on their output and by extension, their income. The inadequacy of productive resources is exacerbated by lack of credit facilities for small farmers, the shortage of marketing centres, inefficient transport system, poor communications, insufficient physical infrastructure and dearth of agricultural extension services. Amelioration of these handicaps in order to increase food security, reduce rural poverty and improve on rural infrastructure by directly delivering resources to the benefiting rural farmers efficiently and effectively; and empowering them to collectively decide on how resources are allocated and managed constitute Fadama III Project's hallmark objective.

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.

Successive governments, collaborating with various development partners, have invested huge sums of money in poverty reduction projects especially in rural areas but not much have been achieved in terms of sustained growth and improved living standard in the rural communities. It is against this background that the Third National Fadama Development

project was embarked upon by the 36 states and the Federal Capital Territory (FCT) (Enugu State Fadama Coordination Office, 2008).

The choice of co-operatives as agent institution for the project might have been governed by United Nations Department of Economic and Social Affairs (UNDESA), (2009), observation that co-operatives, as economic enterprises and as self-help organizations, play a meaningful role in uplifting the socio-economic conditions of their members and their local communities. Over the years, co-operative enterprises have successfully operated locally-owned people-centred businesses while also serving as catalysts for social organization and cohesion. With their concern for their members and communities, they represent a model of economic enterprise that places high regard for democratic and human values and respect for the environment. As the world today faces unstable financial systems, increased insecurity of food supply, growing inequality, rapid climate change and increased environmental degradation, it is increasingly compelling to consider the model of economic enterprise that cooperatives offer. The cooperative sector, especially in developing countries, also presents itself as an important element that can contribute to the realization of the Millennium Development Goals (MDGs) by 2015.

Imo State Fadama Iii Context

Fadama III 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 is a World Bank assisted project implemented 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 a 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, *et al*, (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, *et al*, (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 strategies for achieving the above objectives involved the delivery of several inputs and services that would generate desired outputs directly to the benefitting communities. 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 Imo State created in 1991. The State, which derived its name from Imo River, covers an area of about 5,100sq km with an estimated population of about 4.8 million and a population density that varies between 230 to 1,400 people per square kilometer. The State lies within latitudes 4°45'N and 7°15'N, and longitude 6°50'E and 7°25'E. It ranks 13th in population in Nigeria. It occupies the area between the lower River Niger and the upper and middle Imo River. The State is bounded on the east by Abia State, on the west by the River Niger and Delta State; and on the north by Anambra State, while Rivers State lies to the south (Adeyemi, 2011).

It is culturally a homogeneous state as it is a predominantly an Igbo speaking state with minor differences in dialects. The State is divided into 27 local government areas which are Aboh-Mbaise, Ahizau-Mbaise, Ehime-Mbano, Ezinihitte, Ideato-North, Ideato-South, Ihitte/Uboma, Ikeduru, Isiala-Mbano, Isu, Mbaitoli, Ngor-Okpala, Njaba, Nkwerre, Nwangele, Obowo, Oguta, Ohaji-Egbema, Okigwe, Onuimo, Orlu, Orsu, Oru-East, Oru-West, Owerri -Municipal, Owerri-North and Owerri-West.

The main rivers draining the state are Imo, Otamiri, Njaba and Ulasi rivers, all of which have very few tributaries. The high temperature and humidity experienced in the state favour luxuriant plant growth, which ideally should produce the climax vegetation of the tropical rain forest. Economic trees like the iroko, mahogany, obeche, gmelina, bamboo, rubber and oil palm predominate. But due to high population density, most parts of the state have been so farmed and degraded that the original vegetation has disappeared. However, the main agricultural produce in Imo State are palm produce, cocoa and rubber while major staple crops are yam, cassava, cocoyam and maize. The State is blessed with abundant natural resources. These include crude oil, lead, zinc, white clay, fine sand, limestone and natural gas in commercial quantities (Adeyemi, 2011).

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 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 Imo State of Nigeria. It was aimed at determining if their performance was in tune with the objective of Fadama III Project of poverty alleviation through increasing the income and

productivity 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 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 output performance of various crops under the project.

The population for this study consisted of all the FUG crop farmer-members within the 27 Local Government Areas in Imo State spread through the three Agricultural Zones (Orlu, Owerri and Okigwe) of the State. A multistage and random sampling method were adopted to select 1 L.G.A from each agricultural zone in the first stage to get a total of 3 LGAs, in the second stage 4 Fadama User Groups (FUGs) were selected from each of the selected LGAs to arrive at a total of 12 FUGs. In the third stage 6 crop-farmers were selected from each FUG to give a total of 72 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, outputs 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:

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: $\ln INC = b_0 + b_1 EDU + b_2 AGE + b_3 ASI + b_4 DTM + b_5 FFS + b_6 FAS + b_7 ETV + b_8 GEN + b_9 EXP + b_{10} PDR + e_i$

Semi-log: $INC = b_0 + b_1 \ln EDU + b_2 \ln AGE + b_3 \ln ASI + b_4 \ln DTM + b_5 \ln FFS + b_6 \ln FAS + b_7 \ln ETV + b_8 \ln GEN + b_9 \ln EXP + b_{10} \ln PDR + e_i$

Double-log: $\ln INC = b_0 + b_1 \ln EDU + b_2 \ln AGE + b_3 \ln ASI + b_4 \ln DTM + b_5 \ln FFS + b_6 \ln FAS + b_7 \ln ETV + b_8 \ln GEN + b_9 \ln EXP + b_{10} \ln PDR + e_i$

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 dominance of men (59.72%) over women (40.28%) in crop farming in Imo State. The average age of the farmers was 48years. The fact that 81.94% 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 97.22% 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 8, 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 18 years with an average farm size of 1.8 hectares in the State. The study also revealed that an average distance from the farmers' farm site to the market was 5 kilometers.

Income and productive resources 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 accounting for 41.73% of the total income, followed by yam with 36.27%, maize with 10.66% came third and groundnut contributed the least with 1.61%. The estimated income of the farmers after joining the project revealed that cassava maintained its lead with 50.48%, followed by yam with 27.79%, cocoyam with only 0.95% contributed the least. Table 4 shows the mean values of productive resources available to the farmers before and after joining the project to be ₦86,568.19 and ₦281,631.62 respectively with a significant mean difference of ₦195,063.43 as shown in Table 5. The significant increase in the value of productive resource delivery reflected in the very significant increase in the mean income of the farmers from ₦214,281.68 before joining the project to ₦464,425.21 after joining the project as shown in Table 2 and a mean difference of ₦250,143.53 as revealed by Table 3.

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 (T-cal 6.47 > T-tab 2.10) 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 6 and 7 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 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} = 72; N_{BP} = 72; K = 10

Substituting into the formula

$$= \frac{\{3.07612 - (2.04844 + 0.8249689)\} / 10}{(2.04844 + 0.8249689) / 124} = \frac{0.02027111}{0.02317265} = 0.87$$

The Chow-statistic gave a p value of 0.87 which is greater than 0.05 at 5% 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.

Estimated Values Of Productive Resources Of The Farmers Before And After Joining The Fadama Project

Productive resources of the farmers before and after joining the Fadama Project

The estimated values of the productive resources of the farmers before and after joining the Fadama project in Imo State is presented in Table 4. Fertilizer topped the list of productive resources before Fadama with 31.24%, followed by yam with 24.45%, labour accounted for 16.11% while cash that accounted for 0.12% was the least. It will be observed that while plantain earned income, it has no input value because the suckers are not usually bought. A mean value of ₦86,568.19, was expended on productive resources accessed by the FUG crop farmers in Imo State before the advent of Fadama III Project. Estimated values of productive resources used by the farmers after joining the Fadama Project revealed that cash topped the list with 58.08%. Fertilizer had 35.57%, while agrochemicals with 1.83% occupied the least position. After joining the Fadama project, the FUG crop farmers in Enugu State expended a mean value of ₦281,631.62 on the productive resources which is more than double the ₦86,568.19 expended by the farmers before joining the project. This is a

confirmation of the achievement of the project's objective of delivering resources directly to the farmers effectively in order to sustainably increase their income, food security, productivity and to a reasonable extent break the poverty circle which hitherto had been the faith of the rural poor.

Difference in Mean Values of Productive Resources of the FUG Crop Farmers before and after Joining the Fadama Project

Hypothesis II, mean values of productive resources of the FUG crop farmers before and after joining the Fadama project are not significantly different was tested with Paired Samples T-test of the MINITAB statistical packages. The result in Table 5 showed existence of significant differences between the mean values of productive resources of the crop farmers before and after joining the Fadama project in Imo S**t**ates (T-cal 10.26 > T-tab 2.10) at 5% level of significance. The alternative hypothesis which implied that the Fadama project provided the FUG crop farmers more productive resources that enabled them to realize more income and better standard of living was accepted.

Constraints To Project Realization

Crop farmers within Imo State posited that Fadama III Project could have recorded more successes if not for some constraints. Analysis of the constraints posited by the farmers as being detrimental to the success of the project was 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 ranked in order of seriousness. The crop farmers considered irregular fund disbursement method as the greatest set back, other problems listed in a descending order were late release of government cash contribution, demand for users' cash contribution, nonpayment of beneficiary contribution, misconception of the project by benefiting communities, inadequacy of facilitators, inadequate logistics for extension staff/officers, internal wrangling/suspicion among benefiting communities and poor leadership/management by officers of Fadama Community Associations (FCAs)/Fadama User Groups (FUGs).

Conclusion

Fadama III project was a perfect demonstration of government spending on poverty alleviation through co-operatives. All Fadama groups must be incorporated as a co-operative society to benefit from the project. It was an applaudable intervention project which adopted the direct and effective resource delivery to the farmers approach to enhanced the income of the rural poor farmers in Imo State, improve on rural development, ensure food security and productivity as evidenced by significant increase in the estimated mean income and productive resources from ₦214,281.68 to ₦464,425.21 and ₦86,568.19 to ₦281,631.62 respectively. This has satisfied a cardinal objective of the project of sustainably increasing the incomes of Fadama resource users through effective and efficient delivery of productive resources directly to them. The Community –Driven Development (CDD) approach of Fadama III project has motivated the communities to take their destinies in their hands through an organized institution-the co-operatives. The project has not only been favourable to the active age population but had been reasonably gender sensitive because as much as 40.28% of the farmers were females.

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 cassava topping the list. 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

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

Variables	(N= 72)	Percentage	Averages
Gender			
Male	59.72		
Female	40.28		
Age (years)			
20 — 39		18.06	
40 — 59		63.88	
≥ 60		18.06	
			48
Marital status			
Married		97.22	
Single	02.78		
Family size			
1 — 4	13.89		
5 — 9	69.44		
≥ 10	16.67		
			6
Education (years)			
0 — 6	36.11		
7 — 12	58.33		
≥ 13	05.56		
			8
Farming Experience (years)			
1 — 20		59.72	
21 — 40	40.28		
41 — 60	--		
			18
Farm size (hectares)			
0.1 — 2	66.67		
2.1 — 4		23.61	
≥ 4.1	09.72		
			1.8
Distance to Market (km)			
1—5	61.11		
6—10	29.17		
> 10	09.72		

5

Source: Field survey 2013.

Table 2: Estimated income of the farmers before and after joining the Fadama Project in Imo State

Before			After		
Variables	Amount (₦)	% of total	Variables	Amount (₦)	% of total
Cassava	6,437,600	41.73	Cassava	16,915,000	50.48
Yam	5,595,906	36.27	Cassava	9,311,750	27.79
Maize	1,644,925	10.66	Cassava	3,345,870	9.98
Plantain	838,500	5.43	Plantain	1,691,245	5.05
Vegetable	529,300	3.41	Groundnut	1,102,350	3.29
Groundnut	248,300	1.61	Vegetable	823,000	2.46
Cocoyam	133,750	0.89	Cocoyam	321,400	0.95
Total	15,428,281	100		33,510,615	100
Mean income	214,281.68			464,425.21	

Source: Field survey, 2013.

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

Variable	(N= 72)	Mean means	Difference between	T	P	df
IAP		464,425.21				
IBP		214,281.68	250,143.53	6.47**	0.000	93

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 value of productive resources of the farmers before and after joining the Fadama Project

	Before			After	
Variables	Amount (₦)	% of total	Variables	Amount (₦)	% of total
Fertilizer	1,953,550	31.24	Cash	1,637,986.	5 8.08
Yam	1,529,250	24.45	Fertilizer	7,213,160	35.57
Labour	1,007,700	16.11	Yam	3,710,730	18.30
Cassava	566,440	9.06	Cassava	2,361,800	11.65
Vegetable	321,200	5.14	Labour	2,261,750	11.15
Maize	297,400	4.76	Maize	1,029,500	5.08
Groundnut	248,650	3.98	Vegetable	730,350	3.60
Cocoyam	203,000	3,25	Groundnut	563,700	2.78
Agrochemicals	118,600	1.89	Cocoyam	397,500	1.96
Cash	8,000	0.12	Agrochemicals	371,000	1.83
Plantain	––	––	Plantain	––	––
Total	6,253,790	100		20,277,476.5	100
Mean value	86,568.19			281,631.62	

Source: Field survey, 2013.

Table 5: Estimated differences in means of productive resources of farmers before and after joining the project in Imo State

Variable	(N= 72)	Mean means	Difference between	T	P	df
PRA		281,631.62				
PRB		86,568.19	195,063.43	10.26**	0.000	99

Notes: PRA =Productive resources after joining the project PRB = Productive resources before joining the project. N = Number of respondents. ** =Significant at 5% level.
Source: Field survey, 2013

Table 6: 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	188642	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)
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 7: 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

Table 8: 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.