Assessment of the Effect of Fadama III Project on Women Farmers in Shelleng Local Government Area, Adamawa State, Nigeria

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ABSTRACT

The study was conducted in 2018 to assess the effects of Fadama III on rural farmers in Shelleng Local Government Area (LGA), Adamawa State, Nigeria. Sixty women beneficiaries and 60 non-beneficiaries were sampled for the study. Questionnaire was used to obtain information from the respondents on adoption rate of technology, change in income, change in farm size, increase in output and livelihood. Data were analysed using descriptive and inferential Statistics. Findings of the research revealed that the adoption of technologies was huge and significant at P=0.05 except for water pump and harrowing. The findings also revealed that there was a significant increase in farm size, output and subsequently income at P=0.05 among the women beneficiaries compared with non-beneficiaries alike. Also the beneficiaries had better livelihood than the non-beneficiaries in terms consumption expenditure. Contribution to consumption expenditure was significant among the women participants compared to non-participants. In conclusion, Fadama III has made significantly positive impact on the livelihood of the rural women farmers in the study area. It is recommended that credit service providers be involved to help offer credit at competitive interest rates to the poor women using collateral substitutes such as group repayment incentives. The policymakers should as well consider reducing the contribution of the participants from 30% to only 10% in the next phase of the project to enable the poor and vulnerable groups like women, acquire the productive assets like the water pumps.

Keywords: Impact, Fadama III, women, farmers,

INTRODUCTION

The problem of most developing countries, like Nigeria is endemic poverty. Even though Nigeria may have favorable balance of trade and huge foreign exchange reserve, the income per capita remains very low for greater chunk of its citizens. Poverty seems to have persisted in the country especially, among rural dwellers, who are predominantly farmers because of policy and strategy failure (Agbarevo and Okwoche, 2014).

Improved agricultural production is the major weapon in the fight against world hunger and poverty. It aims at improving rural livelihood and increasing economic growth (Umar, 2013). Improving quality of life and reducing level of poverty, increasing income, and consequently improved social and economic livelihood in the rural areas are some of the problems bedeviling Nigeria today (Umar et al., 2013). Despite many years of efforts on technology generation and transfer by the State and Federal Government, agricultural techniques in Nigeria still remained at
its rudimentary level (Simonyan et al., 2013). This has rendered agricultural sector unable to contribute meaningfully to foreign exchange earnings and employment (Balogun et al., 2011). Nigerian government has over the years introduced and implemented several policies and programmes, some of which have gone moribund, while some are still on-going (Ojomugbokenyode, 2012; cited in Okechukwu, 2015). It is important to note that some of the attempts failed because most of the projects and programmes used public dominated service oriented approach.

One of the recent attempts by the government was the establishment of National Fadama Development Project. The first phase of the project followed the previous service oriented approach and did not record much success in its operations (Agbam, 2006). This has led to the establishment of Fadama II in 2004, the design of which came with paradigm shifts from service oriented to a demand-driven-approach and was adjudged successful, however, it did not cover all the states of the federation and this led to the establishment of Fadama III in which all states of the federation participated (Umar, 2013). Even though the project was not gender sensitive, it encouraged social inclusion, in which all groups in the communities have equal chance of participating. The project specifically focused attention on the vulnerable groups like the youths, people with disability, the aged and women. There are strong arguments that rural development policies may not be successful or may have unintended negative effect if the position and role of rural women are not taken into consideration. According to this view, before rural development can be successful, the important role of rural women has to be acknowledged (Deniz, 1992; Franz, 2000; Ekong, 2003; FAO, 2009). Investing in women is thus not only an effective strategy for fighting poverty and hunger, but also a moral imperative (FAO, 2009). There is the need therefore, for a study to gauge the performance of this laudable project among women farmers in Shelleng Local Government Area, Adamawa State, Nigeria.

**Background of National Fadama III Projects**

Fadama III project is a follow-up to the Fadama II project which was assessed to have impacted on the lives of rural farmers, raising their incomes by 63 percent (Iwala, 2014). The project like Fadama II uses the Community Driven Development (CDD) approach, which places beneficiaries in driver’s seat. Local community members under the umbrella of Fadama Community Associations (FCAs) and Fadama User Groups (FUGs), directly participated in the design and implementation of the project. The beneficiaries were empowered through capacity building to improve their livelihoods by increasing income generating activities. Fadama III project established standardised procedures and steps to guide the local people on how to take part in the decision-making process. Beneficiaries under the project were trained to identify the needed infrastructure, execute and manage small-scale development projects in their communities (Iwala, 2014). The major thrust of the project was to increase the income of users of rural land and water on a sustainable basis. This in essence is to increase food security and subsequently reduce rural poverty (Umar, 2013).

According to Bakari (2012) as cited in Umar (2013), these laudable objectives of Fadama III Project were to be achieved through the successful implementation of the well-designed and comprehensive activities of the following components:

i. Capacity building, communication and information support.

ii. Small scale infrastructural development for participating communities.

iii. Delivery of advisory services and input support.

iv. Support to ADPs and promotion of adaptive research.

v. Asset acquisition for FUGs and EIGs.

vi. Project management, monitoring

The project has set target to achieve the following outcomes at the end of its five year period:

1. 75% of participants will increase their incomes by 40% at the end of the project life.
2. At least 10% of net earnings from income generating activities of the participants to be saved annually.

3. 75% of the beneficiaries will be satisfied with operation, maintenance and utilisation of community owned infrastructures and capital assets acquired through the project at mid-term and close of the intervention.

4. Yield of primary agricultural products should be increased by at least 20% among the beneficiaries.

5. By mid-term and close of the project, there should be a physical verification of operation, maintenance and utilisation of assets acquired through the project.

To determine if the project has realised its objectives, both government and independent evaluators have assessed the project to determine the level of performance. The assessments did not however, quantify results women beneficiaries. This study, therefore, is a follow-up to previous appraisal of project which would specifically assess the impact among women beneficiaries of the project.

**METHODOLOGY**

**Study Area**

The study area is located between latitude 9°39′N and 10°18′N of the equator and between longitude 11°59′E and 12°1′8″E of the Greenwich Meridian. Being in the southern part of Adamawa State, it shares a common border with Shani LGA of Borno State to the north, Numan and Demsa LGA to the South, Song Local Government Area to the East, Guyuk LGA and Gombe State to the West.

Shelleng LGA has a mean annual rainfall ranging from 700 to 1000mm. It has two distinct seasons, the rainy season which starts from late May to the end of September/October and the dry season which sets in from November to April. The mean length of the rainy season is 140 days. The predominant rainfall type is conventional, although orographic or relief rainfall occurs occasionally around the mountainous areas of Kem, Wuro-Yanka and Bakta.

The vegetation cover of the area is characterised by Northern Guinea savannah dominated by grasses and few trees. Species of grasses in the area include: *Penstum puperium*, *Andropogon gayanus*, among others. Tree species common in the study area include *Khaya senegalesis*, *Adonsonia digitata*, etc. It is however; necessary to note that large scale deforestation resulting from indiscriminate extraction of wood for fuel and expansion of agricultural land areas has left large area within the vegetation with few plant species, (Akosim et al., 1999).

Shelleng Local Government is made up of five districts, namely: Shelleng, Bodwai, Bakta, Libo and Kin, with total land area of 1,586km2. According to 2006 Population and Housing Census, the LGA has an estimated population of about 148,490. The study area has numerous small settlements of varied ethnic groups and sociocultural background. The major tribes are Kanakuru and Longuda. Others are Fulani, Bura, Lala, Hausa, Igbos and Yoruba living together (Bashir and Raji, 1999).

Agriculture serves as the major source of livelihood in the study area. The soils of the area are suitable for sorghum and cotton production, maize, groundnut and rice which is cultivated in the flood plains. Crops such as sugarcane, vegetables, and sweet potatoes are also cultivated. The study area serves as one of the major producer of sweet potato in Adamawa State (Sajo and Kadams, 1999). Fishing also serve as a complementary activity to farming.

**Sampling Procedure and Sample Size**

To analyse the effects of Fadama III on the benefiting rural women farmers, the respondents were classified into two categories: Direct Fadama III participants and non-participants living in Fadama III communities. The non-participants have comparable socioeconomic characteristics to the Fadama III participants. This categorisation is to allow for determination of the actual benefits of Fadama III project on the livelihood of the rural farmers in the study area.
There are ten Fadama Community Associations (FCAs) in the study area out of which five (5) FCAs were randomly selected at 50%. There are 24 FUGs in the five FCAs selected. Out of this number, twelve (12) Fadama User Groups (FUGs) were randomly selected at 50% and in each FUG, five (5) respondents were selected making a total of sixty (60) respondents. Similar procedure was used to select 60 non-beneficiaries with comparable socioeconomic characteristics. In all, a total sample of 120 farmers was used for this study.

Methods of Data Collection
The study employed the use of primary data. The data were sourced through the use of structured questionnaire that were administered to the participants and non-participants. The data were collected with the help of enumerators.

Analytical Technique
Both descriptive and inferential statistics were used. Descriptive statistics involves frequency counts, mean, percentages and Average Treatment Effect (ATE). Comparability test (T-test) was employed to compare the means from before and after the project between beneficiaries and non-beneficiaries of the project.

RESULTS AND DISCUSSION
Adoption Rate of Technologies among Women Beneficiaries
Agricultural technology refers to the application of technology to develop and improve agriculture through increased productivity (Olayide 1980, cited in Ajayi and Ajala, 2008). Technology transfer is one of the responsibilities of Fadama III project and set a target of 20% adoption rate to be achieved within five years of its operation. The adoption rate among the beneficiaries was over 53%. This achievement was huge compared to only 38% among the non-beneficiaries (Table 1). This has surpassed the set target of 20% by the project.

Table 1: Percentage of women farmers adopting technology before and after

<table>
<thead>
<tr>
<th>Type of respondents</th>
<th>Before</th>
<th>After</th>
<th>% change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beneficiaries</td>
<td>44.78(3.460)</td>
<td>97.36(7.512)</td>
<td>53.69</td>
</tr>
<tr>
<td>Non Beneficiaries</td>
<td>45.24(3.492)</td>
<td>73.33(5.218)</td>
<td>38.30</td>
</tr>
</tbody>
</table>

Note: Numbers in Parentheses are Standard Deviations
Source: Field work, 2018

Adoption is a mental process whereby an individual decides to use a new technology (Oyenwaku and Mbuba, 1991, cited in Ajayi and Ajala, 2008). Adoption of technology among farmers in a project is the most important measure of success of the project and effectiveness of the service (Okoro, 2004).

Table 2: T-test Analysis of Rate of Adoption of Technologies

<table>
<thead>
<tr>
<th>Variables</th>
<th>Beneficiaries</th>
<th>Non-beneficiaries</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Improved Seeds</td>
<td>0.1010(0.02279)</td>
<td>0.0125(0.00881)</td>
<td>0.001**</td>
</tr>
<tr>
<td>Plant spacing</td>
<td>0.1182(0.02665)</td>
<td>0.0562(0.01827)</td>
<td>0.048**</td>
</tr>
<tr>
<td>Herbicides</td>
<td>0.0687(0.02007)</td>
<td>0.0188(0.01076)</td>
<td>0.029**</td>
</tr>
<tr>
<td>Fertilizer application</td>
<td>0.2388(0.03378)</td>
<td>0.0938(0.02312)</td>
<td>0.002**</td>
</tr>
<tr>
<td>Water pump</td>
<td>0.0615(0.01820)</td>
<td>0.0438(0.01622)</td>
<td>0.456</td>
</tr>
<tr>
<td>Harrowing</td>
<td>0.0510(0.01628)</td>
<td>0.0250(0.01238)</td>
<td>0.241</td>
</tr>
<tr>
<td>Improved storage</td>
<td>0.0365(0.01407)</td>
<td>0.0938(0.02312)</td>
<td>0.032**</td>
</tr>
<tr>
<td>Record keeping</td>
<td>0.0770(0.02189)</td>
<td>0.0125(0.00881)</td>
<td>0.006**</td>
</tr>
</tbody>
</table>

Note: Number in parentheses are standard errors
** significant at 5% level
Source: Field work, 2018
Further analysis was conducted to determine the actual impact, as it relates to technology adoption among women in the project communities using comparability test (T-test). The results as shown in Table 2 indicated that eight (8) technologies were introduced in the project communities. The adoption of almost all the technologies was found to be significant among the beneficiaries at P=0.05, except for water pump and harrowing technologies. This is a clear demonstration by Fadama III to fulfill one of the assignments set against its mandate to introduce improved and proven technologies to the community members with the aim of improving their livelihood. The reason for this huge success is not far-fetched; the project has through its activities embarked on on-farm adaptive research and provision of advisory services to encourage the women to adopt those technologies.

**Increase in Income among Women Participants and Non-participants**

The average annual income of Fadama III Project’s beneficiaries and non-beneficiaries is shown in Table 3. Based on the finding, average annual income of the project beneficiaries rose from ₦36,782 before in 2004 to ₦93,709 after the project intervention in 2010. This suggests that the real average incomes of Fadama III women beneficiaries increased by ₦56,927.00 (60.8%) as a result of participation in the project’s activities. This increase is far above the set goal of 40% increase for the Fadama III project to achieve at the end of its life span of five years (Bakari, 2012). The average annual income of the project beneficiaries rose from ₦36,782 before intervention in 2004 to ₦93,709 after the project intervention in 2010. This suggests that the real average incomes of Fadama III women beneficiaries increased by ₦56,927.00 (60.8%) as a result of participation in the project’s activities. This increase is far above the set goal of 40% increase for the Fadama III project to achieve at the end of its life span of five years (Bakari, 2012).

<table>
<thead>
<tr>
<th>Treatment type</th>
<th>Before participation</th>
<th>After</th>
<th>ATE</th>
<th>% change due to participation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beneficiaries</td>
<td>36782.1</td>
<td>93708.8</td>
<td>56,927.7</td>
<td>60.8</td>
</tr>
<tr>
<td>Non-beneficiaries</td>
<td>36883.5</td>
<td>51253.2</td>
<td>14369.7</td>
<td>28.04</td>
</tr>
</tbody>
</table>

Source: Field work, 2018

This increase is also above the average rural household income of ₦42,644 as reported by the 2003–2004 living standard survey (NBS, 2007). By implication, their conditions had improved far above moderately poor and core poor individuals. Moderately poor people refers to individuals who fall below two-third of the mean per capita expenditure for Nigeria (i.e., those with annual income or expenditure less than ₦11,292.96 in 2005 or equivalent of $121.2), while the core poor are those who fall within the category of last one third of the mean per capita expenditure (i.e., those with annual income or expenditure less than ₦5,646.48 (UN, 2001). Comparatively, average real incomes of non-beneficiaries within Fadama III LGAs increased by only 28.04% (Table 3). This means that the average income among women beneficiaries has increase remarkably more than their counterpart of the non-beneficiaries. By targeting women, Fadama III has enabled women to catch up with men in terms of income. There are some arguments in support of this finding which states that, rural development policies may not be successful or may have unintended negative effect if the position and role of rural women are not taken into consideration. According to these views, before rural development can be successful, the important role of rural women has to be acknowledged (Deniz, 1992; Franz, 2000; Ekong, 2003; FAO, 2009). Moreover, they have to be fully integrated and given the possibility of acquiring knowledge and skills and then utilizing them as well. Investing in women is thus not only an effective strategy for fighting poverty and hunger, but also a moral imperative (FAO, 2009).

It is therefore, considerably reasonable to state here that this achievement is attributed to the effectiveness of the CDD approach in service delivery as it encourages social inclusion and gives voice to the community members to take charge of their development agenda. This increase in average income among the beneficiaries is as a result of obvious reasons. It is noted by Ihaenacho...
et al (2007) in their findings that Fadama II project is all embracing in its provision of services and inputs, addressing almost all aspects of agricultural production problems such as productive asset acquisition, capacity building, demand-driven advisory services etc.

**Increase in Productivity among Women Farmers**

Participation in Fadama III could affect both increases in agricultural productivity and agricultural income. Increase in productivity here is measured in terms of farm size and output. If supported by inputs and all other factors like the productive assets acquired by the beneficiaries, larger farm sizes are expected to result into higher output and consequently higher increase in productivity. As findings indicate, productivity among the women in Fadama III communities has remarkably increased due to participation in the project. For instance, the average farm sizes show a great deal of difference between the beneficiaries and non-beneficiaries of the project (Table 4). The estimated ATE is positive for farm size (0.4017ha) with percentage change of over 60 percent. Similarly, output of the participants of the project has seen positive effect (ATE), with the estimated value averaging 2516.94kg. The percentage change for this variable (output) stood at 64 percent, indicating huge differences between the participants and non-project participants (Table 4).

<table>
<thead>
<tr>
<th>Variable type</th>
<th>Beneficiaries</th>
<th>Non-beneficiaries</th>
<th>ATE</th>
<th>% change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Farm size(ha)</td>
<td>0.669(0.9449)</td>
<td>0.2673(1.0250)</td>
<td>0.4017</td>
<td>60.49</td>
</tr>
<tr>
<td>Output(kg)</td>
<td>3914.52(4819.50)</td>
<td>1397.58(2676.99)</td>
<td>2516.94</td>
<td>64.30</td>
</tr>
</tbody>
</table>

Note: Numbers in bracket are standard deviations of the corresponding mean
Source: Field work, 2018;

This result suggests huge evidence of significant impact of the Fadama III on productivity, as measured by changes in the level of farm sizes and outputs among beneficiaries compared with non-beneficiaries as a result of participation. It is expected that increase in production, all things being equal, will definitely contribute significantly to income increases by means of multiplier effect. One of the objectives of the Fadama project is to increase crop yield using improved technology (Kudi et al, 2008). The implication of the higher increase in production reflects higher income to the farmers and consequently improved standard of living (Kudi et al, 2008).

Further analysis to determine the actual impact of the project on income and increase in productivity was conducted using statistical test for difference between women beneficiaries and non-project beneficiaries. The impact of project on productivity as measured by farm sizes and output is large. For instance, the statistical test for difference between the project participants and non-project participants is significant at p= 0.05 (Table 5).

The findings also show an evidence of substantial improvement in the income of the beneficiaries compared to the non-beneficiaries indicated in the earlier findings. For instance, increase in income among women participants and non-project participants shows significant impact at p = 0.05 (Table 5).

<table>
<thead>
<tr>
<th>Treatment type</th>
<th>Beneficiaries</th>
<th>Non-beneficiaries</th>
<th>ATE</th>
<th>t-test</th>
<th>p(value)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Income(Naira)</td>
<td>91818(111535)</td>
<td>42278(17429)</td>
<td>49540</td>
<td>2.038</td>
<td>0.023**</td>
</tr>
<tr>
<td>Output(Kg)</td>
<td>3914.52(4819.50)</td>
<td>1397.58(2676.99)</td>
<td>2516.94</td>
<td>3.827</td>
<td>0.000**</td>
</tr>
<tr>
<td>Farm size (ha)</td>
<td>0.669(0.9449)</td>
<td>0.2673(1.0250)</td>
<td>0.4017</td>
<td>2.504</td>
<td>0.011**</td>
</tr>
</tbody>
</table>

Numbers in brackets are standard deviations of the corresponding mean
** significant at the 5% level
Source: Field work, 2018;
Contribution to Consumption Expenditure

The study analysed the achievement of the project in targeting the poor, by examining the change in consumption expenditure over the period of operation of the project. The interpretation of the result gathered from the respondents indicates that participation in the project has really strengthened the capacity of its beneficiaries to increase their consumption expenditure. The result in Table 6 shows that the consumption expenditure among Fadama III project beneficiaries has increased more than their counterpart of non-beneficiaries. For instance, mean increase in consumption expenditure among the beneficiaries was N29585.50, which is much higher than mean increase of N9654.84 among their counterpart of the non-beneficiaries. Comparing the project beneficiaries with non-project beneficiaries shows a greater divergence in consumption expenditure. Significant achievement is recorded among the project beneficiaries compared with non-beneficiaries.

Further comparability test was conducted to determine if there is a significant change in consumption expenditure before and after the inception of the Fadama II project. The result as shown in Table 6 indicates that there is statistically significant change in consumption expenditure at P=0.05% for project beneficiaries.

<table>
<thead>
<tr>
<th>Outcome variable</th>
<th>Mean (Naira)</th>
<th>Std. Deviation</th>
<th>t-test (paired)</th>
<th>Std. Err</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beneficiaries</td>
<td>29585.50</td>
<td>16731.20</td>
<td>13.923</td>
<td>2124.86</td>
<td>0.000**</td>
</tr>
<tr>
<td>Non Beneficiaries</td>
<td>9654.84</td>
<td>21749.30</td>
<td>1.685</td>
<td>2762.00</td>
<td>0.097</td>
</tr>
</tbody>
</table>

** Significant at the 5% level
Source: Field work, 2018;

Going by this result therefore, it is reasonable to conclude that there is a remarkable change in the consumption of women participating in the project beneficiaries compared to non-project participants. This result is a demonstration of the fact that income inequality has been greatly reduced among the project participants. This remarkable change is attributed to increase in income. Majority of the respondents have attested to the fact that they can now consume what hitherto was not possible to be provided by them. And not only has the participation improved their nutrition, but also accorded them the status and ability to send their children to school conveniently. This result is supported by the claim of Fadama III that its activities target the poor and vulnerable groups like women, youths, the elderly and the physically challenged. There is a strong argument that community-driven development projects can make better use of local knowledge to identify the targeted group and that targeting the poor is likely to reduce income inequality (Mansuri and Rao, 2004).

CONCLUSION AND POLICY IMPLICATION

In conclusion, Fadama III project has enhanced the capacity of its beneficiaries to realise significant increases in farm size, output and subsequently increase in income among women farmers in Shelleng LGA, Adamawa State, Nigeria. The findings have attributed the increase in farm size, output and income among the women to participation in the project with considerable confidence. The estimated average treatment effect of all the variables mentioned above has shown that there is significant change among the beneficiaries at P= 0.05 compared to the non-beneficiaries. This trend of the finding is attributed to the adoption of improved farming technologies introduced by the project among the beneficiaries. The adoption rate of all the technologies introduced were found to be significant at P= 0.05 except for water pump and harrowing.

This means that the project has demonstrated effectiveness in empowering the local women in Shelleng LGA to better their livelihood. The project has served as a better alternative for poverty
reduction among the rural women in the study area. It is therefore, realistic to state here that Community-Driven Development (CDD) operation should be considered as an effective mechanism in channeling development assistance in developing countries as it has also proved effective not only among women but rural areas in general (Mansuri and Rao, 2004).

Policy Implications
In order to incorporate these findings into the existing body of knowledge, the following recommendations are made.

Policymakers
The route to development should be viewed as the involvement of the local people as the main actors in the drama of initiating, planning and implementation of any development programme meant to better their lots. This suggests the need for the government and donors to pool resources and initiate multipronged demand-driven and socially inclusive projects rather than many isolated projects.

Fadama III did not involve credit service providers to help beneficiaries to pay for their contribution. There is need to involve credit service providers by helping them to offer credit at competitive interest rates to the poor women using collateral substitutes such as group repayment incentives. For example, the project could help to strengthen the provision of credit services in rural areas by using strong rural associations. This can indeed help women groups to really access such credit facilities. The policymakers should as well consider reducing the contribution of the beneficiaries from 30% to only 10% in the next phase of the project to enable the poor and vulnerable groups like women, acquire the productive assets like the water pumps.

Project Organizers
The authorities (facilitators, extension agents and government officers) working at the local community levels should take cognizance of the needs and interests of the groups in the rural communities. The choice of strategy and what projects are to be implemented for intended communities need to be given careful consideration by the authorities.

Future Research
Further research is also needed to explore if there will be sustainability of the project’s activities after long-term periods; most especially if the next phase of the project is not forthcoming. Finally, to really determine the effectiveness of this community-driven development project, comparative study can be conducted between the project and some of the long existed service oriented development projects in the State.

REFERENCES


