
Adoption and Sustainability of Livelihood Improvement Practices among Beneficiaries of FADAMA II Project in Katsina State, Nigeria

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Abstract

The study examined the adoption and sustainability of livelihood improvement practices among the beneficiaries of FADAMA II project in Katsina State. Fadama II was a follow-up to the successful implementation of Fadama I between 1993 and 1999 with support from the World Bank. However, the use of the word Fadama in naming the project could be explained by its focus on private economic agents that derive their livelihood either directly or indirectly on the exploration of the natural resources situated in the Fadama areas. Four objectives were constructed to guide the study. The study adopted survey design and used a sample of 355 beneficiaries selected from a total of 25,000 male and female beneficiaries of the project chosen through a multistage sampling technique. Three research instruments were used in the study: Sustainability and Livelihood Improvement Questionnaire that was tested for reliability using Spearman Rank Order and a reliability coefficient of 0.69 was obtained; Key Informant Interview Schedule and Focus Group Discussion Guide. Results from the study indicated that the level of implementation of the sustainability and livelihood improvement practices of FADAMA II during the implementation period was high in Katsina State; the factors that led to the adoption of the sustainability and livelihood improvement practices include technology appropriateness, simple for practice nature of the technology, readily available inputs, adequate knowledge obtained and technology sharing by extension staff leading to livelihood improvement and that male and female beneficiaries significantly differed in their adoption decision of the sustainability and livelihood improvement practices;. The study also demonstrated that the adoption of the sustainability and livelihood improvement practices had positive effects on the personal and occupational activities of the beneficiaries of the project. The major recommendations were that the best practices of the project should be sustained and replicated by governments through capacity building and advisory services; subsidized inputs such as fertilizer and pesticides should be made available to community members who have chosen to adopt the sustainability and livelihood improvement practices so as to boost their production activities.

Keywords: FADAMA II, Livelihood, Improvements, Sustainability, Beneficiaries

Introduction

The FADAMA II project is a National project in Nigeria that covered eighteen states with the World Bank supporting twelve states (namely: Adamawa, Bauchi, Gombe, Imo, Kaduna, Kebbi, Niger, Lagos, Ogun, Oyo, Taraba and FCT) and the African Development Bank (AFDB) supporting the remaining six states (namely: Katsina, Kogi, Kwara, Borno, Jigawa and Plateau) which lasted for six years beginning from 2004. Now that the project period has lapsed and communities were left on their own gives a justification of a study on the sustainability of the gains of the project. Due to constraints of time and resources, the present work was delimited to the target communities in Katsina State only. FADAMA II project was a follow-up to the successful implementation of FADAMA I between 1993 and 1999 with support from the World Bank. The name of the project was derived from the word "FADAMA" which Oredipe (2005) referred to as a local Hausa word that is used to describe low lying flood plains usually with easily accessible shallow or ground water. The use of the word FADAMA in naming the project could be explained by its focus on private economic agents that derive their livelihood either directly or indirectly on the exploration of the natural resources situated in the FADAMA areas of the participating states. (Oredipe, 2005)

The FADAMA II project was designed as a major instrument for achieving the Nigerian government's poverty reduction objective in the rural areas of Nigeria. It was designed to adopt a socially inclusive and participatory process whereby all FADAMA resource users would collectively identify development activities and agree on their investment priorities. To achieve this the project incorporates a paradigm shift development strategy from the traditional public sector domination to a private sector Demand-Driven Development Strategy whereby the FADAMA users are made key actors that take charge of their development agenda. The project lasted for six years beginning from 2004. It was designed to adopt a socially inclusive and participatory process whereby all FADAMA resource users will collectively identify development activities and agree on their investment priorities (PCU, 2003). The goal of the project was to reduce poverty by improving the living conditions of the rural poor and to contribute to food security and increased access to rural infrastructure (PCU, 2003).

The major outputs of the project in terms of livelihood improvement according

to the Project Coordinating Unit (PCU, 2007) were seen in the areas of enhanced capacity of resource users for participatory planning, operation and implementation; strengthened capacity for enterprise development and management; construction and maintenance of rural infrastructure, sanitation, agro-processing, and marketing facilities; establish demand-driven technical assistance and advisory services to resource users; and strengthened capacities of project coordination and management units at Federal, State and Local Government levels. These livelihood improvement practices were intended to be sustained even after the life of the project.

The successes of FADAMA II according to PCU (2007) were attributed to the livelihood improvement practices embedded in the implementation strategies of the project and were intended to be sustainable. An impact study of the projects shows that the beneficiaries were actively involved in Community Development Plan preparation, environmental awareness, group dynamics and leadership, value addition for local FADAMA goods, improved fiduciary and administrative management techniques among others (Ladan, 2010). Project dividends were intended to be fully enjoyed and adequately utilised by the beneficiaries of the project with the expectations that their immediate families, communities and neighbours also benefit. This is feasible if project dividends are diffused into the social system on a sustainable basis thereby ensuring that the best practices of the project are appreciated and right decisions made to continue utilising them in their personal and occupational activities.

The FADAMA II project utilised a number of mechanisms for ensuring the sustainability of its livelihood improvement practices among the beneficiaries. Its approach to policy and programming requires that sustainability mechanisms be embedded into the implementation strategies of all development programmes. It was observed in an earlier study that adequate capacity building and advisory services were offered to the beneficiaries to enable them fully understand the implementation strategy of the project (Ladan, 2010). The FADAMA II project therefore placed emphasis on improving livelihood conditions of beneficiaries and ensures the sustainability of project dividends including creating a sense of ownership in all project decisions and activities. This paper therefore presents the outcome of a study on the adoption and sustainability of livelihood improvement practices among beneficiaries of FADAMA II project in Katsina State.

Statement of the Problem

The FADAMA II project was implemented between 2004 and 2010 in Katsina

State with funding from the AFDB. The mid-term report (PCU, 2007) about the FADAMA II project and some recent studies conducted by Kudi, Usman, Akpoko, and Banta (2008); Ladan (2010); Akangbe, Ogunyinka, Ayanda, Achem and Adisa (2012); Simonyan and Omolehin (2012); and Umar, Phoa & Khalique (2012) found that the project was successful, it was also observed by these scholars that during the implementation phase opportunity is created for adoption of best practices. The studies found that there were some observed significant impacts on the livelihood of the beneficiaries of the project in aspects of improved managerial skills; diversification of production; improved production and productivity; reduction in conflicts; increased income and many more. The project had been completed and a new focus of support from the sponsors has shifted, the beneficiaries were left on their own. This therefore provides justification for a sustainability study to be conducted to find out whether or not the livelihood improvements among the beneficiaries of the project during the period were sustained. The paper therefore presents the outcome of a study on adoption and sustainability of livelihood improvements among beneficiaries of FADAMA II project in Katsina State.

1.3 Research Questions/Hypotheses

Three research questions and two hypotheses were formulated as follows:

1. What is the level of implementation of the sustainability mechanisms and the livelihood improvement practices by beneficiaries of FADAMA II in Katsina State?
2. What are the factors that led to the adoption of the sustainability mechanisms and the livelihood improvement practices of FADAMA II in Katsina State?
3. What are the effects of the adoption of the sustainability mechanisms and the livelihood improvement practices on the personal and occupational activities of the beneficiaries of FADAMA II project in Katsina State?

Ho1: There is no significant difference in the rate of adoption of the sustainability mechanisms of FADAMA II project between male and female beneficiaries in Katsina State.

Ho2: There is no significant difference in the rate of adoption of the livelihood improvement practices of FADAMA II project between male and female beneficiaries in Katsina State.

Methodology

The study adopted survey design which allowed for the observation of effects of natural variations. The design chosen allowed for the use of information from a

sample and generalisation of the findings on the entire population. Data was collected from a sample of 355 beneficiaries were selected from a total of 25,000 male and female beneficiaries of the project chosen through a multistage sampling technique whereby six (6) LGAs, some FADAMA Community Associations (FCAs) and FADAMA Resource User Groups (FRUGs) and 355 participants were selected in first, second and third stages, respectively. Simple random sampling technique was used in the first and second stages where the names of all the LGAs that participated in the Fadama II were written on pieces of paper from where six were randomly selected, accordingly in each of the randomly selected LGAs some FCAs and FRUGs were randomly selected while stratified random sampling was used in the third stage, at this point beneficiaries of Fadama II in those FRUGs were proportionately selected based on the stratum of male and female.

Three research instruments were used in the study: Sustainable and Livelihood Improvement Questionnaire (r=0.69) was used to obtain data. This quantitative instrument was complimented by two qualitative instruments: key Informant Interview and Focus group discussion. The key informant interview was used to illicit information from key officers in the implementation of Fadama II in Katsina State (including project managers, FCA officials and Community Leaders) while the focus group discussion was meant to collect additional information by bringing representatives of the sample into a controlled environment in order to conduct qualitative and in depth interaction with them. Data obtained from the FGD complimented the information obtained from both the questionnaire and the interview with the FADAMA users. Descriptive statistics of frequency counts and percentages were used in analyzing the data collected to answer the research questions while the hypotheses were tested using chi-square.

Results and Discussion of Findings

Demographic Characteristics of the Sample

Table 1 Demographic Characteristic of FADAMA II Beneficiaries in Katsina State

Variable	Response	f	%
Educational Attainment	Primary	55	15.49
	Post Primary	14	3.94
	Quranic Education	217	61.13
	Basic Literary	52	14.65
	Post Literacy	17	4.79
Occupation	Crop Farming	211	59.44
	Livestock Keeping	87	24.51
	Fish Farming	23	6.48
	Crop Processing	19	5.35
	Gathering	6	1.69
	Bee-Keeping	5	1.41
	Hunting	4	1.13
Gender	Male	309	87.04
	Female	46	12.96

Research Question One: What is the level of implementation of the sustainability mechanism and the livelihood improvement practices by beneficiaries of FADAMA II in Katsina State? The question was answered and result is presented in table 2 (a) and 2 (b).

Table 2 (a) Level of Implementation of Sustainability Mechanisms of FADAMA II

Sustainability Mechanism	High		Moderate		Low	
	f	%	F	%	f	%
Payment of counterpart support funds	131	36.90	123	34.65	101	28.45
Participatory planning techniques	94	26.48	190	53.52	71	20.00
Collection of User fees on all projects	34	9.58	260	73.24	61	17.18
Establishment of maintenance sub committees	41	11.55	260	73.24	54	15.21
Adequate training and capacity building	77	21.69	108	30.42	170	47.89
Promotion of group marketing	100	28.17	105	29.58	150	42.25

Table 2 (b) Level of Implementation of the Livelihood Improvement Practices

Livelihood Improvement Practices	High		Moderate		Low	
	f	%	f	%	f	%
Production diversification	172	48.45	120	33.80	63	17.75
Price and market information systems	23	6.48	199	56.06	133	37.46
Conflict management	199	56.06	147	41.41	9	2.54
Environmental awareness	171	48.17	14	3.94	170	47.89
Promotion of group marketing	169	47.61	87	24.51	99	27.89

Table 2 (a) indicated the level of implementation of the sustainability mechanism where the responses were measured on the scale of high, moderate and low. On the level of implementation payment of counterpart support funds 36.90% rated it high while 34.65% rated moderate and 28.45% rated it low, on the implementation of participatory planning techniques 26.48% rated high, 53.52% and 20% rated it low, on the implementation of collection of user fees on all projects 9.58% rated it high, 73.24% rated it moderate and 17.18% rated it low, on the implementation of established of maintenance sub committees 11.55% rated it high, 73.24% rated it moderate and 15.21% rated it low, on the implementation of adequate training and capacity building 21.69% rated it high, 30.42% rated it moderate and 47.89% and in the implementation promotion of group marketing 28.17% rated it high, 29.58% rated it moderate and 42.25% rated it low.

Table 2 (b) indicated the level of implementation of the livelihood improvement practices by beneficiaries of FADAMA II where the responses were rated on the scale of high, moderate and low. On the implementation of production diversification 48.45% rated it high, 33.80% and 17.75%, on the implementation of establishment of price and market information systems 6.48% rated it high, 56.06% rated it moderate and 37.46% rated it low, on the implementation of conflict management 56.06% rated it high, 41.41% rated it moderate and 2.54% rated it low, on the level of implementation of environmental awareness 48.17% rated it high, 3.94% rated it moderate and 47.89% and on promotion of group marketing 47.61% rated it high, 24.51% and 27.89% rated it low.

The beneficiary's ratings as described in the tables were informed by their familiarity with the sustainability mechanisms as experienced or learned during the project implementation phase. Interviews with the project managers and the community leaders confirmed the project beneficiary's ratings since they were directly involved with the implementation process. For example, interview with the CDO revealed that the disparity observed in the implementation rate was largely based on the adoption patterns of the beneficiaries and partly on the emphasis given by the project on some of the sustainability mechanisms.

Research Question Two: What are the factors that led to the adoption of the sustainability mechanisms and the livelihood improvement practices of FADAMA II in Katsina State? The question was answered and result is presented in tables 3 (a) and 3 (b).

Table 3 (a) Factors that led to the Adoption of the Sustainability Mechanisms

Variable	Response	f	%
The major factors that led to adoption of the sustainability mechanisms employed by FADAMA II	a. Technology appropriate	96	27
	b. Technology simple to practice	105	29.6
	c. Inputs readily available	10	2.82
	d. Adequate knowledge obtained	32	9.01
	e. Technology shared through project extension service	112	31.5

Variable	Response	f	%
The major factor that led to adoption of the livelihood improvement practices employed by FADAMA II	a. Technology appropriate	12	3.38
	b. Technology simple to practice	83	23.4
	c. Inputs readily available	15	4.23
	d. Adequate knowledge obtained/gained	51	14.4
	e. Technology shared through project extension service	194	54.6

Table 3 (b) Factors that led to the Adoption of the Livelihood Improvement Practices

Table 4.2 (a) Figure 4.2 (a) indicated the factors that led to the adoption of the sustainability mechanisms introduced by FADAMA II. There were varied factors identified by the beneficiaries as contributors to the adoption of the sustainability mechanisms employed by FADAMA II. The most prominent factor is the fact that technology was shared through project extension service which accounts for 31.5%. 27% of respondents mentioned the appropriateness of the technology as the factor that influenced their adoption, 29.6% opined that technology was simple to practice, 2.82% mentioned that inputs were readily available, and 9.01% mentioned that adequate knowledge was obtained for the practice during the implementation period.

Table 4.2. (b) and Figure 4.2 (b) indicates the factors that led to adoption of the livelihood improvement practices employed by FADAMA II 3.38% indicated technology appropriateness, 23.40% chose technology simple to practice, 4.23% chose inputs readily available, 14.40% chose adequate knowledge obtained and 54.60% said technology shared through project extension service leads to livelihood improvement.

This finding corroborates with the tenets of the Rogers Perceived Attributes Theory as postulated by Rogers (1995) which states that there are five attributes upon which an innovation is judged: trialability, observability, relative advantage, complexity and compatibility. In addition, the interview with project managers also highlighted that the willingness of the beneficiaries to adopt a particular practice is provoked by the capacity building activity undertaken around the said activity. Ensermu and Hassan (2001), further strengthen the tenet of the theory by saying that "adoption decision requires a favourable mental state (conviction) and successful physical act". The first (mental state) is internal and symbolic and achieved through ready availability of the requisite production inputs and services such as seeds, fertilizers, credit and markets.

Research Question Three: What are the effects of the adoption of the sustainability mechanisms and the livelihood improvement practices on the personal and occupational activities of the beneficiaries of FADAMA II project in Katsina State? The question was answered and result is presented in table 4 (a) and 4 (b).

Table 4 (a) Effect of the Adoption of the Sustainability Mechanisms

Variable	Response	f	% of Total
Opinion on impact of the adoption of the sustainability mechanisms of FADAMA II on personal and productive activities of beneficiaries	Yes	333	93.80
	No	22	6.20
Opinion on areas of impact of the adoption of the sustainability mechanisms of FADAMA II on personal and productive activities of beneficiaries.	Improved Counterpart support seeking techniques	123	32.03
	Improved Participatory planning techniques	204	53.13
	Collection of User fees on all projects	333	86.72
	Improved cost effective maintenance services	334	86.98
	Improved capacity on modern techniques of group dynamics and management	197	51.30
	Group marketing and Purchases	167	43.49

Table 4 (b) Effect of the Adoption of the Livelihood Improvement Practices

Variable	Response	F	%
Opinion on impact of the adoption of the Livelihood Improvement Practices of FADAMA II on personal and occupational activities of beneficiaries	Yes	322	90.70
	No	33	9.30
Opinion on areas of impact of the adoption of the Livelihood Improvement Practices of FADAMA II on personal and occupational activities of beneficiaries *	Improved Record keeping and management skills	343	89.32
	Reduced Conflict	225	58.59
	Improved bank relationship	300	78.13
	Improve productivity	342	89.06

Table 4 (a) revealed the effect of the Adoption of the Sustainability Mechanisms where 93.80% indicated that their adoption of the sustainability mechanisms of FADAMA II has affected their personal and occupational activities and 6.20% felt that their adoption of the sustainability mechanisms of FADAMA II has no any effect on their personal and occupational activities. The effects were seen in the areas of improved counterpart support seeking techniques, improved participatory planning techniques, collection of user fee on all projects executed, improved cost effective maintenance services, improved capacity on modern techniques on group dynamics and management and group marketing and purchases. 32.03% selected improved counterpart support seeking

techniques, 53.13% selected improved participatory planning techniques, 86.72% collection of user fee on all projects executed, 86.72% selected improved cost effective maintenance services, 51.30% selected improved capacity on modern techniques on group dynamics and management and 43.49% selected group marketing and purchases.

Table 4 (b) indicate the effect of the adoption of the livelihood improvement practices on the livelihood conditions of the beneficiaries of FADAMA II project in Katsina State where 90.70% responded that the adoption of the livelihood improvement practices have effect on their livelihood conditions while 9.30% do not see any effect of the adoption on their livelihood conditions. To be specific, the respondents shared their opinions on how the adoption of the livelihood improvement practices has affected their livelihood conditions where 89.32% opined that it affected them in improved record keeping and management, 58.59% opined that the fell the effect in reduced conflict, 78.13% have improved bank relationship and 89.06% have improved productivity.

This was confirmed during the FGD where the participants gave a unanimous response on the effect of their participation in FADAMA II and most especially of the adoption of the sustainability mechanisms. Alhaji Mani opined that we now apply the knowledge gained in FADAMA II in all our personal and occupational activities and that has been yielding better results. The findings also corroborate with the opinion of Ibrahim and Omotesho (2008) who observed that cases of non-adoption seen resulted from the non-availability of inputs, in efficiency of input distribution and bureaucratic procedures and that of Muthia (1990) cited by Ibrahim and Omotesho (2008) who shared some experiences from India where adoption of improved technology led to agricultural development, increased demand for labour and higher agricultural input.

Results on the Hypotheses

Ho1: There is no significant difference in the rate of adoption of sustainability mechanisms of FADAMA II project between male and female beneficiaries in Katsina State. This hypothesis was tested using chi square at 0.05 level of significance and the results are presented in the table below:

Table 5 Gender Difference in the adoption of sustainability mechanisms of FADAMA II

Gender	Sustainability mechanisms adopted					χ^2	df	P.Value (0.05)
	Payment of counterpart support funds	Participatory planning techniques	Collection of user fee	Establishment of maintenance sub committees	Adequate training and capacity building			
Male	82 (73.12)	11 (10.45)	50 (58.32)	132 (137.53)	34 (29.59)	24.50	4	9.49
Female	2 (10.88)	1 (1.55)	17 (8.68)	26 (20.47)	0 (4.41)			

*Not significant

Data from table 4.4 indicates that the Chi square calculated (χ^2_{cal}) value is 24.50 and when compared with the chi-square value distribution table (χ^2_{tbl}) the corresponding critical value is 9.49 at 4 degrees 5% level of significance, therefore Chi square calculated is greater than Chi square tabulated ($\chi^2_{cal} > \chi^2_{tbl}$). It means that the hypothesis is therefore accepted.

Ho2: There is no significant difference in the rate of adoption of livelihood improvement practices of FADAMA II project between male and female beneficiaries in Katsina State. This hypothesis was tested using chi square at 0.05 level of significance and the results are presented in table 6:

Table 6 Gender Difference in the adoption of Livelihood Improvement Practices

Gender	Livelihood Improvement Practices Adopted				χ^2	Df	P.Value (0.05)
	Production Diversification	Price and market information systems	Conflict management techniques	Environmental awareness			
Male	138 (145.36)	25 (26.11)	79 (77.47)	67 (60.06)	11.87	3	7.82
Female	29 (21.64)	1 (3.89)	14 (11.53)	2 (8.94)			

*Not significant

Table 6 indicate that the calculated χ^2 value is 11.28 and when compared with the chi-square distribution table the corresponding critical value is 7.82 at 3 degrees of freedom 5% level of significance, therefore Chi square calculated

(χ^2_{cal}) is greater than Chi square tabulated (χ^2_t) or ($\chi^2_{cal} > \chi^2_t$). It implies that the null hypothesis is accepted.

Implications for Extension Service Delivery

Based on the findings of the study, we can deduce the following implications for extension service delivery in Nigeria:

1. Adoption is a gradual process and it is arranged in different levels based on the personal characteristics of the client and it is usually based on certain favourable factors which the extension worker should always pay attention to. So, all community based extension education projects should infuse livelihood improvement practices in their implementation modalities.
2. Gender is an issue in adoption process which the extension worker should pay attention to, therefore the extension worker should give each and every client equal opportunity to participate in the adoption process irrespective of his/her gender so that we can achieve even and sustainable development in our communities. Extension workers should work towards inclusivity so that no gender is deprived or short changed

Recommendations

Based on the study findings as reported in this paper, the following recommendations are presented:

- a) The livelihood improvement practices of the FADAMA II project should be scaled up, sustained and replicated by governments, community cooperatives and philanthropists through capacity building and advisory services to cover other communities initially not covered by the project.
- b) Inputs such as fertilizer and pesticides should be subsidized and made available to community members who have chosen to adopt the sustainability and livelihood improvement practices so as to boost their production activities.
- c) Arrangements should be made to provide adequate training and capacity building activities for communities participating in community support projects such as FADAMA II so as to encourage them to disseminate the best practices learnt especially in terms of project sustainability and livelihood improvement.
- e) Further research on the diffusion of the best practices among non-beneficiaries in project area could be helpful in informing future plans.

Conclusion

The strategy of infusion of sustainability mechanisms and livelihood improvement practices the implementation strategies of FADAMA II were found to be effective and helpful among both male and female beneficiaries of

the project as evidence of personal and occupational improvements were recorded among the beneficiaries. This is reflected in beneficiary adoption and the positive impact it has made on the personal and occupational activities of farmers in the study area. All follow-up and other community projects should learn from the good example of FADAMA II especially in ensuring project goals attainment and continuity after the project life cycle.

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