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## Socio-economic Impacts of Fadama Development Programme on the Participating Farmers of the Two Zones of Kebbi State Agricultural and Rural Development Authority (K.A.R.D.A)

<sup>1</sup>Ango, A. K., A. <sup>2</sup>I. Illo and <sup>3</sup>F. Y. Jibrin

<sup>1&3</sup> Department of Agricultural Extension and Rural Development, Usmanu Danfodiyo University, Sokoto, Nigeria

<sup>2</sup>Department of Agricultural Economics and Extension, Kebbi State University of Science and Technology, Aliero, Nigeria

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**Abstract:** The research was conducted in the year 2000 to examine the socioeconomic impacts of the Fadama Development Programme on the life of the participating farmers. Two zones out of four zones of Kebbi State Agricultural and Rural Development Authority (K.A.R.D.A) was selected for the study. A Sample of 120 participating farmers were randomly selected in the two zones. Descriptive and inferential statistics were used to analyze the data generated with help of SPSS 16.0 Version. The results of the study revealed that majority (85.8%) of the participating farmers were males and were within the age range of 41-50 years with farm sizes of 2-3 hectares. The findings of the research also reveals that most of the participating farmers were involved in the planning and execution of the programme and only registered farmers of Fadama Users Association (FUAs) were found to benefit from the provision of the agricultural inputs by the fadama development programme. The finding of the research indicated that the income generated from the rice and vegetable production among the participating farmers

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was found to be profitable and the land ownership of the farmers had increased after participating in to the programme. The study also revealed that the participating farmers were allowed freely to plant crop of their choice. The Chi-square test result indicates that the demographic characteristics of the farmers are not significantly associated with the fadama programme ( $\chi^2$ =0.6157, P < 0.92239) except farm size ( $\chi^2$ =31.763; p<0.001). The Pearson Product Moment Correlation test on the input provided and project participation status revealed that the technology provided to the farmers by the project has significant influence on the socio-economy of the farmers (r = 0.2479, P <0.001). It is recommended that farmers should be more involved in the programme planning and should be provided with agricultural inputs irrespective of being a registered member of the fadama users association or not.

**Keywords:** Fadama development programme, socio-economics, Impacts, Kebbi State, Nigeria.

#### **INTRODUCTION**

The ultimate goal of Nigerian agricultural policy is the attainment of self-sustainable growth in all sectors of agriculture as well as the realization of the structural transformation necessary for the overall socioeconomic development of the rural areas. As part of these measures, government has continued to accord high priority to irrigated agriculture since the Third National Development Plan<sup>1</sup> 1976-1980 The previous irrigation projects in Nigeria have been largely attributed with top-down approach that resulted to failures of such programmes. This led to the development of fadama irrigation development programme in 1990s which involved farmers in the identification of their agricultural needs and problems, based on which policy formulations were geared. According to Mansell<sup>4</sup> (1996) fadama in Nigeria, is a Hausa tribe word that means a land in seasonally flooded valley bottom. It may also be an isolated depression on the low terrace or the over-bunk zone along a river course. Fadreb<sup>6</sup> (1997) defines fadama land as areas of low lying, poorly drained, flood prone and frequently composed of finer textured and less acidic soil. It is in this fadama land that most of the dry season agricultural irrigation activities are performed by the people that are endowed with the land.

The concept of irrigation connotes the science of economical utilization of water to supplement natural rainfall for the production of crop<sup>2</sup>. Hansen<sup>3</sup> also defines irrigation as the application of water to the soil for any number of the following eight purposes: adding water to soil to supply the essentials for plant growth; provide crop insurance against short duration droughts; cool the soil and atmosphere, thereby making more favourable environment for plant growth; reduce the hazard of frost; wash out or dilute salts in the soil; reduce the hazards of soil piping; soften tillage pans and clods and to delay bud formation by evaporating cooling. In the face of growing population and the desire to ensure better standard of living and increased agricultural productivity through small-scale irrigation, the occupants of Kebbi State started irrigation traditionally with the use of calabash/bucket and shadoof methods. Crop production in the fadama land has traditionally depended on rainfall and or residual moisture after flood recession in the dry season. In areas with easily accessible shallow ground water or surface water, traditional water lifting devices, such as shadoof and calabash/buckets were used to lift water on to the land. In recognition of the continuing limitation posed to expansion of agricultural production by a poor development of irrigation facilities, and the need for the sector to grow substantially, the Federal Government initiated the establishment of National Fadama Development Project (N.F.D.P). Mansell<sup>4</sup> reported that, in an attempt to boost the traditional irrigation system, the Federal Government of Nigeria has contracted a loan of US\$67.9 million from the World Bank to finance the development of the fadama land under the National Fadama Development Project (N.F.D.P). According to him, the pioneer beneficiaries included Bauchi, Jigawa, Sokoto and Kebbi States.

**Statement of the Problem:** Traditional irrigated farming was known to be in practice by the people of Kebbi State through the shadoof and calabash/bucket methods<sup>5</sup>. But this practice has been found to be obsolete and totally inadequate to cope with the present food demand. In support of traditional irrigation method, Fadreb<sup>6</sup> reported that traditional irrigation strategies have been practiced for several decades in Nigeria. To improve these traditional methods, the Federal Government introduce the Fadama Development Programme (N.F.D.P) under the Agricultural Development Programme (A.D.Ps) policy, which was aimed at improving the living standard of the farmers in the fadama areas through the provision of fadama irrigation inputs (digging of boreholes, provision of motorized pumps, fertilizers, agro-chemicals, improved seeds etc.) Developments arising from the fadama (small- scale) irrigation development programme resulted in to the cases of incessant conflicts between the fadama farmers and Fulani herdsmen who believed that the fadama lands are not meant for cultivation of crops but rearing of animals especially during the dry season of the year have been widely reported. Consequently the socio-economic impacts of the fadama irrigation programme on the benefitting farmers may not justify the huge investment on the programme.

In view of the vital role and potentials of fadama irrigation farming as one of the solutions of meeting the national food needs, it becomes imperative to evaluate the impact of the fadama development programme on the farmers of the two zones of Kebbi Agricultural Development Authority (K.A.R.D.A) as a means of generating the much needed information for future programme planning and implementation.

**Objectives of the Study:** The general objective of the study is to examine the socio-economic impacts of fadama development programme on the farmers of the two zones of Kebbi State Agricultural and Rural development Authority (K.A.R.D.A). The specific objectives of the study are to:

- 1. Describe the socio-economic characteristics of the fadama participating farmers.
- 2. Assess the socio-economic benefits of the programme.
- 3. Examine the improved technologies provided to the participating farmers.

4. Suggest ways of ameliorating the problems facing the fadama development programme farmers.

#### Hypotheses of the Study

1. There is no significant relationship between farmer's socio-economic characteristics and impact of the programme.

2. There is no significant relationship between technologies provided and project participation status.

3. There is no significant difference between land cultivated before and after programme take-off.

## METHODOLOGY

**The Study Area:** The study was carried out in Argungu and Bunza zones of Kebbi States Agricultural and Rural Development Authority (K.A.R.D.A). Kebbi State was carved out of Sokoto State in 1991 and it lies between latitude 10° and 13.3°N and longitude 3.3°N and 6.13°E. It shares a common boundary with two of Nigerian's neighbouring countries, Benin Republic and Republic of Niger to the west. Within the country, it borders Sokoto State to the north and Niger State to the south.

The climate of the area is generally characterized by high temperatures ranging between March and May, with annual temperatures varying between 38°C to 42°C and the area experiences harmattan wind between late November to early February, with temperatures as low as 23°C. The study area is located in the

sudano-sahelian ecological zone and experiences serious moisture deficiency for greater part of the year<sup>7</sup>. Rainfall usually begins in early May, while heavy fall is experienced between July and October with mean annual rainfall varying between 500 mm to 800mm. The climate of the area encourages the production of crops and animals both during rainy and dry seasons of the year, which makes majority of the inhabitants to choose farming as an occupation.

**Sampling Procedure and Sample Size:** Out of the four zones of Kebbi State Agricultural and Rural Development Authority (K.A.R.D.A), Argungu and Bunza zones were purposively selected because of the availability of fadama lands and farmers practicing dry season farming under Fadama development programme. Multistage sampling technique was used to select two Local Government Areas (Argungu and Bunza Local Government Areas) from each zone, and three districts were selected from each of the selected Local Government Areas. From each of the districts selected, three villages were chosen and from eache of the villages selected, twenty farmers (20) were randomly chosen for the study, making a sample size of the study to constitute one hundred and twenty (120) participating farmers.

**Source of Data:** A structured questionnaire was used to gather information from the selected participating farmers (Primary data). The secondary data for the study was restricted to the official documents of the State agricultural project and the coordinating office of the fadama development programme, text books, journals, proceedings, and internet.

**Pre-testing for Reliability and Validity:** The draft questionnaire to be administered to participating farmers was reviewed by the agricultural extension experts (face validity) to ascertain the content validity. The instrument was also subjected to pre-test with forty respondents (participating farmers). Consequently, analysis of internal consistency was carried out using split-half method and a reliability coefficient of 0.737 was obtained.

**Data Analysis Procedure:** The data obtained was analyzed using frequency count distribution; percentages and mean variations were determined using test analysis. The degree of associations between the dependent and independent variables were determined using Chi-square, Pearson Product Moment Correlation and t-test.

## **RESULTS AND DISCUSSIONS**

#### (a)Socio-economic characteristics of the farmers:

**Gender:** The findings in **Table-1** showed that majority (85.5%) of the participating farmers were males while only (14.16%) were females. The reason behind less number of female farmers was because people of the study area believed that farm works are mainly for males while women are left with household chores. This statement is in accordance with the findings of Chinyere<sup>8</sup>, who reported that rural female farmers are not statistically identified as an active population in farm operations. As a result, their productive economic roles are regarded as part of their domestic and reproductive roles.

**Age:** The result in **table 1** also indicated that 30% of the fadama farmers were within the age brackets of 41-50 years, 26.7% of the participating farmers were within age range of 31-40 years, and only 4.2% were within the age bracket of less than 20years. This indicated that most of the farmers that participated in the programme are in their active productive years.

**Farm size:** Fadama farming was normally found to be in practice especially during the dry season of the year, where most of the farmers cultivate small piece of land of less than 4 hectares. The findings in **table 1** indicated that 14.4% of the participating farmers had a farm size of 2 hectares, 25.8% of the farmers had a farm size of 2-3 hectares while 30% of the participating farmers had farm size of 5 hectares and above. The finding implies that almost all the farmers cultivated 2-5 hectares of land. This result is based on the findings of Bello et al<sup>9</sup> who reported that majority of the farmers of Sokoto Rima River Basin operate on a small - scale basis with only 2-3 hectares of fadama plots under their operation.

**Educational attainment:** Many findings of researches conducted revealed that majority of the people of the northern region of Nigeria normally enrolled in to qur'anic schools before enrolling in to western education, this makes majority of them having qur'anic education even in the absence of western education. As shown in the finding of **Table-1**, majority (64%) of the fadama participating farmers had attended qur'anic school and 35.8% had formal education. The attainment of any type of education was found to have favourable attitudes towards acceptance and adoption of agricultural innovation. This might be the reason why majority of farmers participated in fadama development programme.

Variable	Categories	Frequency	Percentage (%)
Gender	Female	17	14.2
	Male	103	85.8
Age	< 20 years	05	04.2
	21-30 years	25	20.7
	31-40 years	32	26.7
	41-50 years	36	30.0
	51 years and above	22	18.3
Marital status	Single	09	07.5
	Married	103	85.8
	Divorced	05	04.2
	Widowed	03	02.5
	Islam	117	97.5
Religion	Christianity	02	01.7
	Traditionalist	01	00.8
	Qur'anic	77	64.0
Educational	Non formal educ.	00	00.0
attainment	Formal educ.	43	35.8
	Adult educ.	00	00.0
Occupation	Civil servant	31	25.8
	Business	60	50.0
	Artisan	29	24.2
Family size	1-10 people	60	50.0
	11-20 people	39	32.5
	21-30 people	15	12.5
	31-40 people	06	05.0
	< 2 hectares	17	14.2
Farm size	2-3 hectares	39	25.8
	4-5 hectares	28	23.3
	5 hectares and above	36	30.0

Fable - 1: Distribu	tion of participat	ing farmers den	nographic charac	teristics (n=120)
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#### Source: Field survey 2000

#### (b)Social Impacts of the Fadama Programme:

**Cooperative Membership:** The pre-requisite condition for a farmer to benefit the supply of agricultural inputs and extension services by the fadama development programme depends on the ability of the farmers to form fadama users groups (FUGs), under which all agricultural inputs and other assistance are provided

through the leaders of the groups. As shown in **Table-2**, majority of fadama farmers (75.8%) belong to the Fadama Users Association (FUAs). Large numbers of farmers were found to belong to the fadama users groups/ association because it is only registered members of the association that are entitled to the provision of tube wells, pumps and other agricultural inputs. This finding corroborated with the view of Umaru<sup>1</sup> who reported that the Kebbi Agricultural and Rural Development Programme drill tube wells and supply water pumps on loan basis only for members of Fadama Users Association (FUAs). This is enough to democratically motivate farmers to form and join associations.

**Type of Land Ownership:** Land for farming and any other purpose is mostly inherited in the northern part of Nigeria and which distribution among the heirs of the deceased person is restricted to the dictate of the Islamic religion. While other lands especially for farming are either purchased or leased from those that inherited the land from their parents. The findings in **Table-2** also indicated that most of the fadama participating farmers (54.2%) acquired land through inheritance, 37.5% of the farmers were found to have purchased the land while only (5.8%) of the farmers borrowed the plot of the land. Acquisition of land through inheritance was found to be very high among fadama irrigation farmers; this is because inheritance is the common mode of acquiring land and land of a diseased person is normally passed to his heirs based on the Islamic lay down rules. This finding is in accordance with Sintiki<sup>10</sup> who pointed that the introduction of Shari'a in most part of the north at the beginning of the 17<sup>th</sup> century has undermined the customary principles which emphasized collective ownership of land. It also has established rules concerning transfer, inheritance and commercial transactions in land.

Variable	Categories	Frequency	Percentage (%)
Cooperative Membership	No	24	20.0
	Yes	96	80.0
Fadama Users Association	No	29	24.2
	Yes	91	75.8
Farmers Club	No	77	99.2
	Yes	43	00.8
Water Users	No	199	99.2
Association	Yes	01	08.0
Farmers Cooperative Society	No	65	54.2
	Yes	55	45.8
Type of Land ownership	Inheritance	65	54.2
	Purchased	45	37.5
	Borrowing	07	05.8
	Leasing	03	02.5

Table-2: Distribution of participating farmers according to their participation in cooperative membership and mode of land acquisition (n=120)

Source: Field survey, 2000

#### (c)Economic Impacts of the Fadama Development Programme:

Land ownership before and after programme: Due to its drudgery nature, most of the fadama farmers engaged in cultivating fewer plots of land (1-4 hectares) that can be easily managed but few of the better-off among the rural populace engaged in cultivating many hectares ranging from 5 hectares and above. The finding in **Table-3** indicated that among the small-scale fadama farmers, majority (62.5%) cultivated 1-3ha before the programme take-off and which has reduced to 46.7% of participating farmers cultivating 1-3ha after programme take-off. But based on the large-scale cultivation, it could be seen from the finding that 26.7% of the participating fadama farmers cultivated 4-6 hectares of land as compared to 35.8% cultivating

the same hectares of land after project take-off. It was also discovered that only 1.7% of the farmers cultivated 10-12 hectares of land before project take-off when compared with 5.8% cultivating the same hectares of land. This implied that the number of farmers cultivating more lands among the fadama farmers has decreased in terms of small-scale farming but it was found to have increased among the large-scale fadama farmers.

Variable	Categories	Frequency	Percentage (%)
Land before programme	1-3hectares	75	62.5
	4-6hectares	32	26.7
	7-9hectares	10	08.3
	10-12hectares	02	01.7
	>13hectares	01	00.8
Land after programme	1-3hectares	56	46.7
	4-6hectares	43	35.8
	7-9hectares	12	10.0
	10-12hectares	07	05.8
	>13hectares	02	01.7

 Table-3: Distribution of participating farmers according to land ownership before and after programme intervention (n=120)

Source: Field survey 2000

**Crops grown before and after the programme:** As shown in **Table-4**, a high proportion (61.7%) of the farmers grew grains (rice) before the programme take-off, but the propotion of farmers that grow rice reduced to 57.5% after project take-off. Also 14.3% of the farmers were found growing vegetables before project take-off when compared to 16.7% of the farmers growing vegetable after the project take-off. The findings of the research implied that there is a shift on the cultivation of grains among the farmers before and after the fadama programme, this ought to be due to the fact that the fadama farmers were never dictated to, as per which type of crop to be grown. This result is in contrast with Sintiki<sup>10</sup> who posits that, with the provision of modern irrigation, government dictated the farmers to grow grains (wheat and rice) under the policy of Accelerated Wheat Production Programme (AWPP). The finding of Sintiki is an evidence of the large scale irrigation projects (Dams) policies in Nigeria where farmers are forced or dictated to grow a particular crop (especially cash crops) on which the government has a special interest.

## Table- 4: Frequency distribution of respondents according to crops grown before and after programme take-off (n=120)

Variable	Categories	Frequency	Percentage (%)
Crops grown before	Grains	74	61.7
programme	Tubers	29	24.2
(rice,tomatoes,pepper and	Vegetables	20	14.3
spinach)			
Crops grown after	Grains	69	57.5
programme( rice, tomatoes	Tubers	31	28.8
pepper and spinach)	Vegetables	20	16.7

#### Source: Field survey 2000

**Income realized in a Season:** The main essence of participating in any agricultural programme is to improve one's living standard through increase in earnings. The findings in **Table-5** revealed that only (3.3%) of the fadama farmers had an income of N145, 000-N180, 000 before the inception of the programme but after participating in to the programme, the number of participating farmers' earnings of

N145, 000-N180, 000 has doubled to 6.6%. The result also indicated that 23% of the farmers earned an income of more than N181, 000 before the project take-off when compared with an increment of 25% of the farmers, after project participation in an agricultural season. This implied that there was an increase in the number of participating farmers' income after the programme take-off.

Table- 5: Frequency distribution of farmers according to their income/ season when a ba	ag of
unshelled rice was N2, 500 (n=120).	

Variable	Categories	Frequency	Percentage
Income before	N1,800-N36,000	41	34.2
programme	N37,000-N72,000	17	14.2
	N73,000 - N108,000	15	12.5
	N111,000- N144,000	15	12.5
	N145,000-N180,000	04	03.3
	> N 181,000	28	23.0
Income after	N1,800-N36,000	39	32.5
programme	N37,000-N72,000	20	16.6
	N73,000 - N108,000	15	12.5
	N111,000- N144,000	07	05.8
	N145,000-N180,000	08	06.6
	> N 181,000	30	25.0

Source: Field survey, 2000

Test of Associations between dependent and independent variables: The chi-square ( $\chi^2$ ) analysis in **Table-6** indicated that the demographic characteristics of the farmers are significantly associated with the effect of the programme except for farm size ( $\chi^2$ =31.763; p< 0.001).

The table further revealed that the impact of the programme on farmers before and after programme takeoff was analyzed using t-test. The result of the analysis showed that more land was cultivated by the fadama farmers after the programme take-off (t=1.23; p > 0.22).

# Table-6: Relationship testing between farmer's demographic characteristics, technology provided and land cultivated before and after project take – off.

Variables	Test-values	Df	P - value	Mean + SE
Gender and programme impact	X <sup>2</sup> =0.6157	2	0.92NS	
Technology provided and total impact(social and economic) of the programme	r =0.2479	5	0.01***	
Land cultivated before and after programme	t=1.23	210	0.22***	0.131

NS = Not significant;\*\*\* Significant at 1%

## CONCLUSION AND RECOMMENDATIONS

**Conclusion:** Based on the objectives, and research questions that guided this study, it could be concluded that irrigation farming is a male dominated profession, on which farmers found to attained average status in terms of socio-economic standard. It's evident from this study that farmers were involved in the decision making especially on planning the programme and they were encouraged to participate in

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cooperative organizations and the common association joined by most of the participating farmers was fadama user's association (FUA). It is also evident that only registered members of the fadama users association were provided with the required agricultural inputs. The fadama farmers cultivated more land after the project, thus, indicating that fadama irrigation farmers benefitted from the programme. The findings of the research also revealed that the participating farmers were allowed by the programme to plant crops of their choice.

**Recommendations:** Based on the findings, discussion and conclusions drawn from the research, the following recommendations are deemed necessary:

1. Policy makers should find more viable alternatives of involving farmers in the design, planning and implementation of any irrigation scheme through Community Demand Driven (CDD) approach.

2. Fadama farmers should be provided with agricultural inputs irrespective of forming and or joining any association.

3. Financial institutions such as banks and Nongovernmental Organizations should provide irrigation facilities to the farmers in addition to the effort of the National fadama development programme.

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\*Correspondence Author: Ango, A. K., A. ; Department of Agricultural Extension and Rural Development, Usmanu Danfodiyo University Sokoto,<sup>2</sup>Department of Agricultural Economics and Extension, Kebbi State University of Science and Technology, Aliero, Nigeria Email: aakamba2@yahoo.com; aakamba2@udusok.org.ng