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Profitability Analysis of Fadama Farming in Akure South Local Government Area of Ondo State, Nigeria

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Abstract **– The study was carried out to assess the profitability of fadama farming in Akure Local Government south Ondo state. The specific objectives of the study are to estimate the cost and returns of fadama farming and examine the factors determining its profitability. Akure south local governments area was purposively selected due to the intensity of fadama farming activities in the areas. Ten (10) villages were purposively selected from the local government area and ten respondents from each villages were selected for the study. Primary data were collected through the use of structured questionnaire. The findings revealed that majority (68%) of the respondents were male, 77% had formal educations. The finding further showed that 56% of the respondents claimed that fadama farming increases the annual profit; 33% submitted that pest and diseases infestation are major problem hindering their farming activities while 10% claimed low capital as their major problem. Regression result using linear model showed that age (X_1), Gender (X_2), marital status (X_3) level of education (X_4), household size (x_2) were significant at 5% level. It was recommended that government should utilize the abundance of vegetations in the country for fadama which will improve the level of food security and boost the Nation's Gross Domestic product.**

Keywords **– Descriptive, Profitability, Regression and Socio-Economic Characteristics.**

I. INTRODUCTION

Nigeria is faced with the challenges of providing adequate food supply for its teaming population. With a current population of about 140 million [1], has consistently listed Nigeria among countries that are technically unable to meet their needs from rain – fed agriculture at low level input. Furthermore, the devastating effect of desertification and drought in the last three decades on the dry subhumid and semi – arid agro – ecological zones of Nigeria have made Nigeria government to embark on massive investment in small scale irrigation.

The growing demand for food couple with seasonal variations, unpredictability and unreliability that have characterized the pattern of rainfall in the sub – humid and semi arid agro – ecological zones of Nigeria have necessitated the supplementation of rain – fed agriculture with irrigation.

The goal of increasing food production and reducing food importation has elicited many programmes and policies at the various level of government.

The first was the establishment of River Basin Development Authorities (RBDA) in the early 70s and by the late 1980s, the development of small scale irrigation systems in fadama land areas commenced. In 1993, Federal Government of Nigeria in collaboration with the World Bank and state governments started a new program referred to as the national fadama development project. Many reasons have been advanced for the necessity of supplementing rain – fed agriculture in Nigeria and hence the current investment in the widely acclaimed small scale irrigation practices (fadama) by the Nigeria government in an effort in this direction.

Many government's agricultural intervention in developing programs in Nigeria have not had lasting impact on agricultural development and that many have not yielded the expected result of sustained increase in food production [2].

According to [3], Fadama are low laying subjected lands subjected to seasonal floods on water logging along the banks of streams or depressions.

It is Hausa language meaning, the seasonally flooded or floodable plains along major savanna rivers and depression or adjacent to seasonal perennially flowing stream and river. It is also called "akuro" in Yoruba land.

Fadama lands are the only area cultivated during the dry seasons; they are small in size and located in areas regarded as inaccessible and under complicated land ownership arrangement [4]. Fadama farming is a traditional cropping system along the river side using residual moisture after flood recession or pumps to lift up the water from the wet season during the dry season and sometimes for cultivating local rice variety the wet season (flooded rice)

Upland farming is practiced under rain – fed condition. The main crops grown around Hadeija area under such condition are millet, cowpea, sorghum and beans. These grains constitute the basis of food consumption in Northern Nigeria.

The constraints militating against sustainable fadama development in Nigeria are legions. For instance, according to [4], thousands of fadama lands remain uncultivated due to the process of accessibility or remoteness which tends to inhibit the spread of new idea and the concept of fadama development. [5] also identifies that some of the common drawback in management of fadama are the occurrence of marshy lands and swaps, which are difficult to work, thereby making the development and management of fadama expensive and occasionally unhealthy.

[2], 1998 noted that the lack of post harvest technologies, poor handlings, poor road network and lack of means of preservation constitute a major constraints of fadama products preservations. Hence, it became

necessary to evolve programs that can arrest the trend and thus fadama users should play a significant role with the extensions agents. It would be necessary therefore to find out its effect farmers' ability to improve food production thereby reducing scarcity, high cost and allow better distribution of farmers' income throughout the year.

II. Statement of Problem

Food insecurity is a major problem in most developing countries of the world (Nigeria inclusive) despite natural endowment according to [6] the potentials of fadama farming to increase food production and thus ensure food security in Ondo state is enormous. Annual and biannual crops that can provide quick financial returns to farmers could be grown under fadama farming, hence many farmers in Ondo state have adopted this type of farming. The potential of fadama has been widely documented in Ondo state as reported by [6]. Fadama has potential of increasing food production in Nigeria and most of the crops are cultivated within a short period of time i.e the annual and biannual crops which provide quick financial returns to the farmers in Ondo state have adopted this type of farming based on its profitability.

With the adoption of fadama and its consequent profitability in Ondo state, it is important to examine the profitability of fadama farming in akure south local Government Area of the State. Hence the need to carry out the profitability Analysis of fadama farming in Akure south Local Government Area of Ondo State.

The broad objective of this study is to analyze the profitability of Fadama farming in Akure South Local Government of Ondo State. The Specific objectives are: to examine the socio – economic characteristics of fadama farmers; estimate the cost of fadama farming; estimate the returns of fadama farming; determine the factors affecting the profitability of fadama farming

III. Literature Review

The Meaning of Fadama Agriculture

Fadama Agriculture has been described as flow plains water similar in some respect to irrigation water, but it is not supplied by man. As started by [7], flood pass over the surface of the land, water is absorbed by the soil and stored for subsequent use by plants. In some cases, agricultural production is dependent upon flood water, which encourages peasant farmers to practice irrigated agriculture along the banks of rivers during the dry season when the river is flooded.

[8] pointed out that the development of fadama agriculture will not only provide income to the farmers but also make a significant impact on the drive towards sufficiency in crop production. The land irrigation can be cropped extensively during raining season as well as during the dry season. Thus, making the land much more productive off – season for production of various food crops and vegetables. These farm products normally command better price than those produced during the traditional rain fed growing season.

[9] observed that small holder's farmers in west Africa countries have displayed small enterprise and inventiveness in the use of wet land environment for farming purpose.

[1] pointed out that in the south western Nigeria, crop and vegetables such as rice, maize and Amaranthus species, tomatoes and pepper, are very popular, and are grown in dry season to make more profit. The motive to grow crop and vegetables in the fadama lands is principally to make gain at a time of dry season.

[10] found out that the benefits derived from growing crops on flood plain are;

1) Diversification of production
2) Use of the labor force available at the end of the raining season i.e the wet season.

The general objectives of the fadama production programmes according to [11] was to support the development of small – scale fadama farming in the state, through dissemination of appropriate technology for water use, provision of fadama infrastructure, wells and pumps. The funds would also cover support services such as training, planning and evaluation so as to:

1) Increase crop production through expansion of irrigable land
2) Consolidate the experience staff of the beneficiary ADP in fadama development water management and produce marketing.
3) Strengthen the capacity of fadama users to manage water more effectively for dry season farming.
4) Improve the overall income earning of the fadama farmers

[11] opined that fadama farming offers one of the possibilities of increasing agricultural production if well managed. The national fadama development projects (NFDP) signed loan agreement between the Federal Government of Nigeria and the International Bank for Reconstruction and Development (IBRDO). The work was to be executed in Bauchi, Jigawa, Kebbi, Kano and Kaduna as the main core states.

The programme covers the entire cultivable fadama area of the Ondo State estimated at about 150hectares. The beneficiary farmers are expected to join the National fadama users association to be registered with ADP and the ministry of commerce and industry.

IV. Benefits of Fadama Agriculture Programme

The benefit derived from fadama agriculture programme as reported by [11] are as follows;

1) The programme has increased the asset base of the participants.
2) It as increased the fadama farmers income rate and as well changed their standard of living.
3) The programme has also increased the higher level of technical efficiency of the farmers.
4) It has also increased the training and knowledge of the participant in low – land irrigation farming.
5) The programme also increased the supply and availability of food production all over the year.

These suggest that the programme has a positive impact on the farmers and has given them a wide potential of alleviating poverty in the country.

V. METHODOLOGY

A. Study Area

The study was carried out in Akure South Local Government Area of Ondo State. It occupies an area of about 1,591 square kilometers with population of about 420,594 inhabitants [5]

The study area composes of Ten (10) location of Aponmu, Aule, Oda, Shagari, Isikan, Oke –Odu, Oke Obare, Igisogba, Adofure, and Ita – Oniyan

The annual rainfall in this area ranges between 1,25mm – 1,500 mm and the relative humidity is between 70%, 98% with temperature ranges between 22% - 23%. The agro climatic condition in the location is well suitable for agricultural production. The major occupation of the people in the Local Government Area are farming and trading. The major food crops grown in the area include maize, yam, vegetables, cowpea among others while poultry, piggery sheep and goat are amongst the livestock production reared in the Local Government.

B. Sampling Procedure

Purposive sampling techniques was used to select the local Government Area based on the intensity of the fadama farming activities. Ten (10) communities were selected from the local Government using random sampling method. Ten fadama farmers were randomly selected from each of the communities making a total of 100 respondents.

C. Method of Data Collection

The data used in the study were obtained through the use of structured questionnaire. The questionnaire elicited information on socio – economic characteristics of the respondents such as gender, marital status, educational status, Household size, and income.

Method of Data Analysis

The data collected was analyzed by use descriptive statistics of percentage, frequency and by regression analysis. Ordinary least square regression analysis was used with the linear model as specified below.

$$Y = B_0X_1+B_2X_2+B_3X_3+B_4X_4+B_5X_5+B_6X_6+ B_7X_7 + B_8X_8 + B_9X_9 + e_i \quad (1)$$

Y = income generated per annum (profit)
X_1 = Fadama farming gives more return
X_2 = Engage in fadama farming only
X_3 = Age
X_4 = Gender
X_5 = Marital Status
X_6 = Educational Status
X_7 = Household size
X_8 = Income from other crops
X_9 = Increase in annual income
ei = error term

Result Presentation and Discussion of Data

Table 1 showed the outcome of socio economic analysis of fadama farming in the area of the studies. The table showed that 68% of the respondents were males which could indicate that there were more men who engaged in fadama farming in the study area. The Table showed that that 57% of the respondent were married, this could imply that the fadama farming was a profitable venture capable of sustaining the families of fadama farming practitioners. The table also showed that 77% of the respondents are literates. This could imply that their educational level enhances their production efficiency and effectiveness since they can easily adopt innovation. The Table also revealed that 6% of the respondents had minimum family size of 6. This is implies that the enterprise could generate enough revenue to cater for their family livelihood. Also 86% of the respondent engage in fadama farming. This could imply that it is one of the major occupation of people in the area of study. About 56% of the respondents had an unhindered access to the land hence could encourage investment in land. Also 89% of foods crops namely cereals, corn & tubers, vegetables and legumes are produced in fadama farming. This could be an indication that fadama farming can provide source of sustenance for the farmers family throughout the year. About 70% of the respondents claimed that fadama farming is profitable. This could enhance the stability of the business enterprises in the study area. Also that 71% of the respondent claimed that rainfall affect their crop cultivation positively. This could imply that even with minimal rainfalls; fadama farming activities can still be practiced. About 35% of the respondents reported that they do not have access to quality inputs and equipments. This could have implication for scale of operation and profitability. Also 56% of the respondent claimed that fadama farming could be highly profitable. This conforms with the earlier observation that the enterprise can support adequately the sustenance of the farmers' family. This could have implication for food security and poverty alleviation.

Table 1: Socio – Economic Characteristics Of Fadama Farmers

Gender	**Frequency**	**Percentage(%)**
Male	68	68
Female	32	32
Total	**100**	**100**
Marital status	**Frequency**	**Percentage(%)**
Single	35	35
Married	57	57
Divorced	4	4
Widowed	4	4
Total	**100**	**100**
Level of Education	**Frequency**	**Percentage(%)**
No formal education	12	12
Adult Education	22	22
Primary education	17	17
Secondary education	27	27
Others	23	23
Total	**100**	**100**
Household Size	**Frequency**	**Percentage(%)**
1-3	39	39.0
4-6	55	55.0
7-8	6	6.0
Total	**100**	**100.0**

Fadama farming as main occupation	**Frequency**	**Percentage(%)**
Yes	86	86
No	14	14
Total	100	100
Source of land acquisition	**Frequency**	**Percentage(%)**
Lease hold	4	4
Rent	30	30
Inheritance	50	50
Purchase	6	6
Reserve land	10	10
Total	**100**	**100**
Crops cultivated	**Frequency**	**Percentage(%)**
Cereals	30	30
Root and tubers	12	12
Vegetables	37	37
Legumes	10	10
Sugarcane and tree crops	11	11
Total	**100**	**100**
Profitability of fadama higher than other farming	**Frequency**	**Percentage(%)**
Yes	70	70
No	30	30
Total	**100**	**100**
Effect of Rainfall distribution on fadama farming	**Frequency**	**Percentage(%)**
Positive effect	71	71
Negative effect	29	29
Total	**100**	**100**
Availability of Inputs And Equipments	**Frequency**	**Percentage(%)**
Yes	35	35
No	65	65
Total	**100**	**100**
Extent of Returns	**Frequency**	**Percentage(%)**
Perception of the level of profitability of fadama	11	11
Fairly profitable	22	22
Profitability	11	11
High profitable	56	56
Total	**100**	**100**

Source: field survey data, 2012

Table 2 revealed that about 33% of the respondents complained of infestation of pests and diseases which reduces their output; 20% on transportation,10% on low capital and labour availability, 3% on rodent, and thefts while 21% complained on land, improper storage facilities etc. while all these problems are complained about, some people are neglecting fadama farming for other enterprises, which reduce the level of food availability in the study area and in the country at large.

Table 2 also indicated that 31% of the respondents suggested spraying of insecticides as the solution to infestation of fadama by insects, pests and diseases, 16% suggested construction of good roads, 13% provision of loans, 5% each suggested provision of adequate storage facilities, inputs at subsidized price, setting of trap and fencing while 19% suggested other means of financing as solution to problems encountered in fadama projects in the area of study.

If the solutions suggested can be proffered to the problems raised by the respondents; more people will venture into fadama farming and more food will be made available all year round in the study area in particular and the state in general

Table 2: Problems and Suggested Solutions to Fadama Farming

Problems	**Frequency**	**Percentage(%)**
Transportation	20	20
Pest and disease infestation	33	33
Low capital	10	10
Non availability of labour	10	10
Rodents and thefts	4	4
Other	23	23
Total	**100**	**100**
Solution	**Frequency**	**Percentage(%)**
Construction of good road	16	16
Provision of adequate storage facilities	5	5
Spraying of insecticides	31	31
Provision of loans	13	13
Land availability	6	6
Provision of input at subsidize price	5	5
Setting of traps and fencing	6	6
Others	19	19
Total	100	100

Source: field survey data, 2012

Table 3 showed the outcome of regression analysis of the fadama farming in the area of study. The regression showed that R^2 is 0.981. It implies that 98.1% of the variability in the estimated revenue per annum (Y) is being accounted for by the independent variables in the number of people that engage in the fadama farming (x_2), Gender (x_4), Marital Status (x_5), Educational level (x_6), Household size (x_7), and income from other crops fadama farming. The positive sign associated with age (x_3), Gender (x_4) Marital Status (x_5), Educational level (x_6), Household size (x_7) and increase in come (x_9) shows that an increase in the value of these variables will increase the profitability of fadama farming. On the other hand, the negative sign associated with the number of people who engaged in fadama farming (x_2) and income from other crops (x_3) implies that increase in their value will reduce

and affect the rate at which the respondents will practice fadama farming and thus the level of profit.

Table 3: Result of Regression Analysis

Variable	Estimated Coefficient	Standard Error
Constant	27139.24	1229.7
Fadama farming gives more return (X_1)	1229.79	15244.97
Engage in fadama farming only (X_2)	-28478.32	13544.07
Age (X_3)	354.32	4068.01
Gender (X_4)	0.876	0.042
Marital status (X_5)	0.918	0.042
Educational Status (X_6)	0.902	0.056
Household Size (X_7)	1.062	0.140
Income from other crops (X_8)	- 9.589	2.575
Increase in annual income (X_9)	0.826	0.023
Squared	0.981	
R^{-2} Adjusted R Square	0.979	
F- Statistics	4.6471	
5% level of significance		

Source: computed from field survey data, 2012

VI. Summary

The main objective of this study is to analyze the profitability of fadama farming in Akure South Local Government Area of Ondo State.

Finding from the study showed that 66% of the respondents are males, 59% are married, and 87% of the respondents' farmers were literates.

The coefficient of variability (R^2) was 0.981 which implied that 98.1% of the variability in profitability of fadama is being accomplished for the variables specified in the model.

The problems observed include transportation, improper storage facilities, infestation of pests and diseases among others.

VII. Conclusion

Despite all the constraints fadama farming is still being practiced by many farmers because of its being profitable. It also helped to provide employment for the farmers during dry seasons which led to continuous farming and sustained availability of food over the year in the area of study.

Recommendation

In view of the above findings, the following recommendations were made; so as to improve the profitability of fadama farming.

The government should try by using the mechanism of public – private partnership to provide: loans for the farmers at a low interest rate as to ensure security, storage facilities to avoid wastage, input at a subsidized rate, the Government should also Construct drainage system to prevent excess water logging of the farmland, accessible market for the sale of fadama products and motorable roads for easy transportation of farm products.

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