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Effects of Fadama III Project on Dry Season Onion Farmers' Income in Sokoto State, Nigeria

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Abstract
The effect of Fadama III project to the improvement in the income of participating dry season onion farmers in Sokoto State was studied. Population of the study comprised of all dry season onion farmers in Sokoto State. Purposive sampling was used to select six Local Government Areas, while random sampling technique was used to select 15 respondents each from the project participants and non-project participants in each of the six Local Government Areas. Descriptive statistics and gross margin analysis were used for data analyses. Findings of the study revealed that Majority (63.53% and 76.40%) of project beneficiaries and non-project beneficiaries respectively did not attain any form of formal education. Cost of fertilizer dominated the production cost for both the project beneficiaries (46.61%) and non-project beneficiaries (55.99%) of total cost. Result of the gross margin analysis shows that the project participants made more profit in dry season onion production (₦241, 854.89) compared to the non-project participants (₦63,328.59). It was recommended that Fadama III project should as much as possible expand their area of operation so that more farmers can benefit from their services.

Key Words: Fadama III Project, Dry Season, Onion Farmers, Income

1. Introduction

In recent years Nigeria had witnessed the implementation of several agricultural development programmes as a strategy to alleviate poverty through improved productivity and incomes of the resource poor small income farmers. This category of farmers live and operate in the rural areas all over Nigeria and are involved in the cultivation of different types of food and cash crops using the traditional production methods. One of such agricultural development programmes is the Fadama Development Programme (FadamaI), established in 1992 with the aim of encouraging poor farmers to embark on dry season cropping in order to generate increased income and alleviate poverty. The second National Fadama Development Project (Fadama II) came as a follow – up to Fadama I project and the Third National Fadama Development Project (Fadama III) as a follow – up to Fadama I and II projects. The Fadama III project was an Official Development Assistance funded project and it operates for five years (2009 - 2013) in the thirty six (36) states and the Federal Capital Territory (FCT).

In Sokoto state, agriculture is the dominant occupation, though farmers are constrained by the lack of finance to enhance their agricultural production activities. Another constraint is the fact that Sokoto State is located in the semi-arid region where rain fed agriculture is the most widely practiced and the rainy season last for six months or less. As a result of the limited rainy season, households whose primary occupation is agriculture-based have often contented with idleness of their resources (especially labour and land) during the dry season, thus the profitability of agricultural activities is severely impaired [1]. Fadama farming is therefore essential not only to increase the chances of success of crop and animal productions in the dry season, but also to reduce risks in the wet season resulting from fluctuations in rainfall pattern thus, enhancing the welfare of the beneficiary households. The Third National Fadama Development Project (Fadama III) is one of such efforts by government to ease farmers' financial constraints with a view to enhancing their welfare. The objective of this study therefore is to examine the contribution of Fadama III Project to the improvement of incomes of the benefiting households as against non-beneficiaries. In this regard, onion which is one of the most widely cultivated dry season crops in Fadama areas of Sokoto State is considered. The performance of beneficiary farming households who were supported by Fadama III project with improved production technology, inputs, finance and other support services were assessed and compared with that of the non-beneficiary farming households.

2. Methodology

The study was conducted in Sokoto State. Located in the northwestern corner of Nigeria, the State has a land area of 33,776.89 square kilometers, and is located between longitudes 11° 30' to 13° 15' East and latitudes 4° to 6° North of the equator. The State is bordered in the north by Niger Republic, Zamfara State to the East and Kebbi State to the South and West [2]. The State consists of twenty three (23) local government areas, each endowed with different natural resources and a vast Fadama land for irrigation farming. The State falls within the savannah vegetation zone, with mean annual rainfall ranging from 500 mm to 1,300 mm. There are

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two major seasons in the State; the wet and dry seasons. The dry season starts from October and last up to April or May. The wet season on the other hand begins in May or June and lasts up to September or October. The harmattan, a dry, cold and fairly dusty wind is experienced in the state between November and February. Heat is severe in the State in the months of March to May. But, the weather in the state is always cold in the morning and hot in the afternoon. Over 80 percent of the inhabitants of the state practice one form of agriculture or the other. They produced such crops as millet, guinea corn, maize, rice, potatoes, groundnut, beans and vegetables as well as rear livestock [2].

The population of the study comprised of all dry season onion farmers in Sokoto State. Purposive sampling was used to select six Local Government Areas (LGAs) for the study. Purposive sampling was used to ensure the selection of LGAs with outstanding potentials in the cultivation of dry season crops, two from each agricultural zone. The LGAs selected are Wurno and Goronyo for Sokoto East, Kware and Sokoto North for Sokoto Central, Shagari and Yabo for Sokoto South agricultural zones.

The project data base was used to obtain a list of project beneficiaries and non-beneficiaries and their villages. The non-beneficiaries were drawn from a list of those who earlier indicated interest in the project but were not selected for participation. Random sampling technique was used to select 15 respondents each of project participants and non-project participants from each of the six LGAs to arrive at 90 respondents each of participants and non-project participants. However, 85 questionnaires for project participants and 89 for non-project participants were used for analysis for the onion enterprise.

Descriptive statistics were employed for data analysis on socio-economic features of respondents. Gross Margin analysis was employed to assess the gross income and margin obtained by the two categories of respondents. The model used is of the form:

GM = TR – TVC

Where,

GM = Gross Margin

TR = Total Revenue

TVC = Total Variable Cost

3. Results and Discussion

3.1 Socio-Economic Characteristics of Respondents

Socio-economic characteristics of respondents considered in the study include age, gender, marital status, household size, educational attainment, major occupation and years of farming experience. These variables were considered because of the role they play in describing important features of the respondents involved in the study.

3.1.1 Age of respondents

With regard to involvement or participation in agricultural activities, age becomes a very important factor to consider. Age of a farmer was reported to be very vital in determining the level of production of a community [1]. The distribution of respondents according to age is presented in Table 3.1.

Result of the study revealed that 40.00% of project beneficiaries and 43.82% of non-beneficiaries were aged between 41 and 50 years. Up to 23.53% of beneficiaries and 15.73% of non-beneficiaries were aged between 31-40 years while, 5.88% and 3.37% of respondent beneficiaries and non-beneficiaries, respectively were aged 61 years and above (Table 3.1).

This shows that for both beneficiaries and non-beneficiaries, a higher proportion of respondents were aged 50 years or less. This implies that participants in the project were in their active/productive years and can easily be convinced to accept new innovations. This is in agreement with previous findings [3,4] that majority of the respondents (64.08% and 65.87% for Fadama II beneficiaries and non-beneficiaries respectively) were within the age range of 30 – 50 years. The mean age of beneficiary respondents was 43.53±10.76 years, while that of non-beneficiaries was 45.17±10.50 years.

3.1.2 Gender and marital status of respondents

Although there are female farmers actively involved in agriculture, the proportion of male farmers always dominates in almost all communities in North Western Nigeria. The females are much more involved in processing activities due to cultural reasons. Findings of the study with regards to gender shows that majority (65.88%) of the respondent beneficiaries were male, while the remaining 34.12% were female. For the non-beneficiaries, majority (71.91%) were male, while the remaining 28.09% were female. Participation of female in agriculture is low due to religious reasons. Findings of the study with regards to marital status of respondents are presented in Table 3.2.

Table 3.1: Distribution of respondents according to age

Age range (years)	Project beneficiaries		Non-beneficiaries	
	Frequency	Percentage	Frequency	Percentage
21-30	11	12.94	8	8.99
31-40	20	23.53	14	15.73
41-50	34	40.00	39	43.82
51-60	15	17.65	25	28.09
61 above	5	5.88	3	3.37
Total	85	100.00	89	100.00

Source: Field Survey, 2015

Table 3.2: Distribution of respondents according to marital status

Marital status	Beneficiaries		Non-beneficiaries	
	Frequency	Percentage	Frequency	Percentage
Married	59	69.41	67	75.28
Single	13	15.29	8	8.89
Divorced	10	11.76	10	11.24
Widowed	3	3.53	4	4.49
Total	85	100.00	89	100.00

Source: Field Survey, 2015

Table 3.3: Distribution of respondents according to household size

House hold size	Beneficiaries		Non-beneficiaries	
	Frequency	Percentage	Frequency	Percentage
1-5	10	11.76	12	13.48
6-10	67	78.82	71	79.78
11-15	5	5.88	3	3.37
16-20	3	3.53	2	2.25
21 and above	-	-	1	1.12
Total	85	100.00	89	100.00

Source: Field Survey, 2015

Table 3.4: Distribution of respondents according to educational attainment

Level of education	Beneficiaries		Non-beneficiaries	
	Frequency	Percentage	Frequency	Percentage
Informal	54	63.53	68	76.40
Primary	20	23.53	14	15.73
Secondary	11	12.94	7	7.86
Total	85	100.00	89	100.00

Source: Field Survey, 2015

Table 3.5: Gross margin analysis for beneficiary and non-beneficiary respondent' onion farmers

Variable Input	Beneficiary onion farmers		Non-beneficiary onion farmers	
	Cost per ha	% of total	Cost per ha	% of total
Seeds	1436.02	6.07	946.37	4.57
Fertilizer	11045.53	46.61	11593.17	55.99
Agro chemical	4139.03	17.46	1087.17	5.25
Family labour	2818.94	11.89	3979.68	19.22
Hired labour	4257.43	17.97	3100.76	14.97
Total variable cost	23696.95	100	13806.57	100
Total revenue	265551.84		84,035.74	
Gross margin	241,854.89		63,328.59	

Source: Field Survey, 2015

Majority (69.41% and 75.28%) of the project beneficiaries and non-beneficiaries, respectively were married. Only 15.29% for beneficiaries and 8.89% of non-beneficiaries were single, while the rest were either divorced or widowed. In a similar study, Abarshi [5] reported that 79.50% and 79.95% of beneficiaries and non – beneficiaries respectively were married. Married people are seen to be more committed to agricultural production activities with a view to growing enough food to feed the family and income to take care of family expenses. Married people also have the potential for having children that can assist in farm work.

3.1.3 Household size

Household size determines the amount of family labour available for farm work particularly in rural households. Therefore the farm size a family can cultivate is determined by the amount of family labour available. Gulma [1] reported household size as an important factor, as it represents the number of persons available for farm work as well as the farm size that can be cultivated by households. The mean house hold size for respondents in this study was found to be 7.59±3.06 members for beneficiaries, while that of non-beneficiary respondents stood at 7.36±2.74 members. The distribution of respondents according to household size is presented in Table 3.3.

Table 3.3 showed that majority (78.82% and 79.78%) of the respondent beneficiaries and non-beneficiaries, respectively had household sizes of 6-10 members. Up to 11.76% of beneficiaries and 13.48% of non-beneficiaries had household sizes of 1-5 members, while only 1.12% of non-beneficiaries had household sizes of 21 members or more. In similar studies, Tanko [6] reported an average household size of 10 members for tomato farmers participating in Fadama II Project in Niger State. Also, Mohammed *et al.* [7] reported an average household size of 8 and 10 members for beneficiaries and non-beneficiaries, respectively, in their study on the impact of second national Fadama development project on the income and wealth of crop farmers in Niger State, Nigeria.

3.1.4 Educational attainment of respondents

Respondents' level of education is an important aspect of human resource development. It contributes to the understanding and adoption of new farming techniques, thus enhancing productivity and output. It was observed that more literate and educated farmers are better than the less literate or less educated farmers in agricultural productivity [5]. The level of educational attainment of respondents is presented in Table 3.4.

Result of the study revealed that majority (63.53%) of project beneficiaries and (76.40%) of non-beneficiaries did not attain any form of formal education. Up to 23.53% of beneficiaries and 15.73% of non-beneficiaries attained primary education, while 12.94% of beneficiaries and 7.86% of non-beneficiaries had secondary education. The findings of the study shows that, the literacy level of the respondents was low compared to the findings by Ngaski [3] where 41.75% and 25.71% of respondent beneficiaries and non-beneficiaries, respectively did not have any formal education and that of Abarshi [5], who reported 43.08% and 44.72% of beneficiaries and non-beneficiaries, respectively did not have any formal education. Majority of the respondents in this study (Table 3.1) were aged 41 years and above. The fact that higher proportion of respondents in this study did not attain formal education could be due to the fact that many primary schools in the study area were not in existence when these respondents were of school age.

3.1.5 Crops Cultivated by Respondents

Respondents were engaged in the cultivation of different crops during the dry season. However, the study focused on onion which was one of the most widely cultivated dry season crops by farmers in the study area.

3.2 Gross margin analysis per hectare for beneficiary and non-beneficiary onion farmers

The gross margin analysis per hectare for respondent project beneficiary and non-beneficiary onion farmers is presented in Table 3.5. Result shows that beneficiary respondents produced at an average cost of N17, 902.53 per hectare as against N13, 806.57 per hectare for non-beneficiary respondents in the study area due to the fact that beneficiaries access subsidized inputs supplied by the government which are not always available to the non-beneficiaries. The combined cost of labour (family and hired) dominated the cost of production among the two categories of respondents, accounting for 51.24% for both beneficiary and non-beneficiary respondents.

The cost of fertilizer also played a major role in the cost of production for both categories of onion farmers. The cost of fertilizer for beneficiary respondents accounted 46.61% and 55.99% for non-beneficiary respondents. The cost of fertilizer for non-beneficiary respondents exceeded that of beneficiary respondents because the beneficiaries of the project obtained the fertilizer through government agencies, while non-beneficiaries of the project obtained their fertilizer from open markets at a higher price.

The average gross margin for beneficiary and non-beneficiary respondents were N241, 854.89 and N63, 328.59 respectively. The results show that beneficiary members of the project who engaged in the production of onion earned more profit than non-beneficiary members in the study area. Gross margin of beneficiary respondents was higher because they had access to improved inputs and were guided on appropriate agronomic practices such as use of improve seeds, fertilizer and crop protection practices by *Fadama* III technical officers, thus their output and income were higher. This finding compared with Mohammed *et al.* [7], who reported that onion enterprise was more

profitable for beneficiary members than non-beneficiary members of the project.

4. Conclusion

Dry season onion is a major source of income for farmers in the study area. The output obtained by farmers was however limited due to the use of traditional production techniques and limited use of essential production inputs among other constraints. In line with its objectives, one of which is to increasing farmers' income and the alleviation of poverty, the Fadama III project extended support to its participating farmers through finance and the supply of essential inputs as a means of assisting the farmers to improve their output and farm income. The gross margin analysis revealed that beneficiary respondents paid more for variable inputs particularly seeds and agrochemicals compared to the non-beneficiaries, but had higher output resulting to higher gross margin compared to that of the non-beneficiaries, thus clearly indicating that Fadama III positively affects the incomes of participating dry season onion farmers in the area of study.

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