

IMPACT OF FADAMA III ON FARMERS' MARKET ORIENTATION IN AKWA IBOM STATE, NIGERIA

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Abstract: This study investigated the market orientation of farmers in Akwa Ibom State. Data were obtained from 443 farmers, including Fadama III farmers, non-Fadama III farmers in Fadama participating local government areas, and non-Fadama farmers in non-Fadama participating local government areas. The household commercialization index was employed in the analysis. Most of the beneficiaries of the project were commercialized, whereas the majority of the farmers in the non-beneficiaries' groups were in the transition stage of their market orientation. Socioeconomic analysis reveals that the beneficiaries of NFDP III were older, more educated, and had more years of farming experience.

Keywords: Fadama III, farmers, beneficiaries, non-beneficiaries, market orientation.

1.0 INTRODUCTION

In recent times, global food demand has continued to escalate with the increasing world population, most prevalent in developing economies (FAO, IFAD, 2021; Otekunrin et al., 2020; Otekunrin and Otekunrin, 2021). Subsistence farming practiced by more than two-thirds of the population in developing countries must be transformed to meet the ever-growing food demand in the region and in the world at large. Transformation from subsistence agriculture to commercial agriculture is a crucial pathway that could lead to the growth and development of many low- and medium-income countries, such as Nigeria, that mainly depend on agriculture (Otekunrin et al., 2019). With the World Bank's funding and support, several projects, such as the National Fadama Development Project, have been implemented. The third phase of the project has as one of its objectives the re-orientation of farmers toward agricultural commercialization.

Capitalizing on the power of comparative advantage, commercialization promotes market orientation and productivity that leads to economic growth at the federal level and increased household income of both rural and urban households (Carletto et al., 2017; Otekunrin, 2021).

Market orientation is the organization-wide generation of market intelligence pertaining to current and future customer needs, dissemination of the intelligence across departments, and organization-wide responsiveness to it (Berhanu et al., 2010). It is a production decision issue influenced by both production conditions and market signals. It is also the degree of allocation of resources (land, labor, and capital) to the production of agricultural

produce meant for exchange or sale (Berhanu and Moti, 2010). Based on marketable surplus, the Food and Agriculture Organization (FAO, 1989) categorized farmers into three groups: subsistence farmers, transition farmers, and commercial farmers. Subsistence farmers produce a marketable surplus under 25% of the total production, transition farmers produce a marketable surplus ranging from 25% to 50% of the total production, and commercial farmers produce a marketable surplus of more than 50% of the total production. According to Moti (2010), marketable surplus refers to quantities of products available for consumption by non-farm populations and raw materials for manufacturing and processing industries.

The National Fadama Development Project III (NFDP III), a project of the federal government of Nigeria, was designed through a pooled World Bank loan to support the financing and implementation of six components which are Capacity Building, Communications and Information Support, Small-Scale Community Owned Infrastructure, Advisory Services and Input Support, Support to Agricultural Development Programs (ADPs) and Sponsored Research, Asset Acquisition for Individual farmers and project management, monitoring and evaluation (World Bank, 2008). Fadama III provided support to up- and down-stream activities aimed at streamlining input and output marketing, including efficient transportation of inputs and outputs, processing, and storage. One of the cardinal goals of the National Fadama III Project was to reorient farmers toward agricultural commercialization through the provision of community-owned infrastructure, such as market stalls, and linkage of beneficiaries to off-takers. Improvement in the market orientation of farmers was expected to be evident in the increased commercialization of beneficiaries of the program.

This study investigated the market orientation of farmers who participated in the National Fadama III Project. The study further compared the market orientation of beneficiaries and non-beneficiaries of the National Fadama Development Project in the study area. To this end, the following research questions were considered: i) what is the market orientation level of Fadama III farmers in Akwa Ibom State? ii) Does this commercialization index differ from those of the non-beneficiaries of the program? The specific objectives of this study were as follows: i) to analyze the socio-economic characteristics of farmers in the study area; ii) to determine the market orientation level of Fadama III farmers in the study area; and iii) to compare the market orientation level of NFDP-III beneficiaries with that of the non-beneficiaries of the project.

2.0 CONCEPTUAL FRAMEWORK

One of the cardinal goals of the National Fadama Development Project was to reorient farmers toward agricultural commercialization. This was achieved through the provision of input support and ownership of productive assets such as hoes, cutlass, and irrigation facilities. Access to and ownership of these assets will increase production and, thus, sales. Other ways the project was to achieve its cardinal goal was through the provision of community-owned infrastructures, such as market stalls, capacity building of participants, and linkage of farmers to off-takers who would buy off their produce at favorable price to the farmers. All the afore-mentioned methods were aimed at increasing the quantity of farm produce cultivated by the farmers and, accordingly, the quantity displayed for marketing. Figure 2.1 conceptualizes the linkages between the components of the National Fadama Development Project III and market orientation.

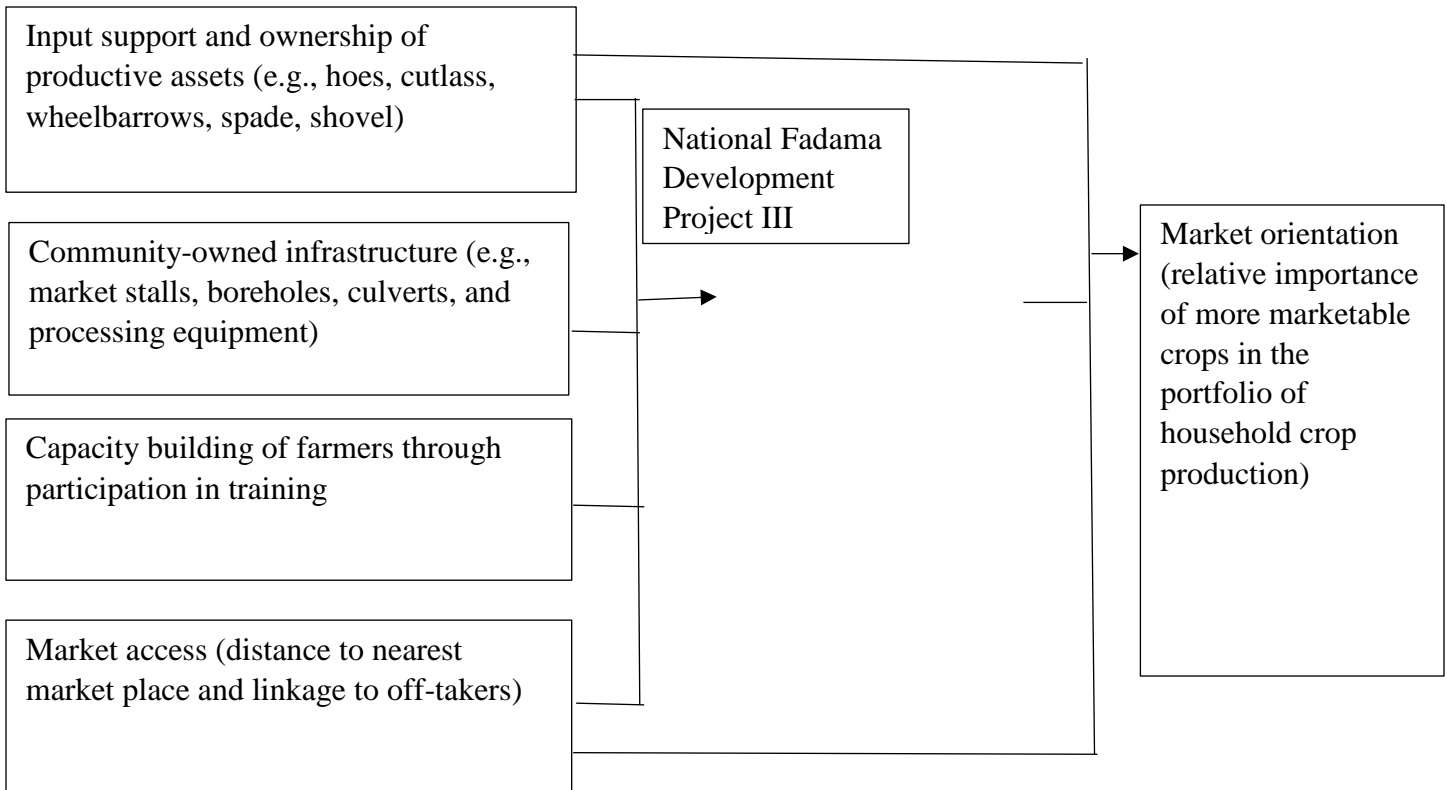


Figure 2.1: Market Orientation Conceptual Framework

Source: Authors' Conceptualization

3.0 RESEARCH METHODOLOGY

3.1 Study area

The study was conducted in the state of Akwa Ibom, Nigeria. It lies between latitudes 4⁰32' and 5⁰33' and longitudes 7⁰25' and 8⁰25'. It occupies a distinct and contiguous area of 8,412 km². The state is bounded on the north by Cross River and Abia states, on the south by the Atlantic Ocean. To the east, it is bounded by the Cross River State and to the west by the Rivers and Abia States. The landscape of Akwa Ibom is mostly flat. This is because the state's underlying geology is predominantly coastal plain sediments. The coastal nature of the state makes it the natural deposit of a mosaic of marine, deltaic, estuarine, lagoonal, and fluvio-lacustrine material. The location of the state north of the equator and within the humid tropics and its proximity to the sea makes the state generally humid. Based on its geographical location, the climate of Akwa Ibom State can be described as a tropical rainy type, which experiences abundant rainfall with very high temperature. The state's mean annual temperature is between 26⁰C to 29⁰C and acreage sunshine accumulated to 1450 hour per year, while mean annual rainfall ranges from 2000mm to 3000mm depending on the area. Naturally, the maximum humidity is recorded in July, while the minimum occurs in January. The thick cloud cumulonimbus type is commonly experienced from March to November. Evaporation is high with annual values ranging from 1500 to 1800 mm.

The physical relief of the state is flat. Some areas have valleys, creeks, and swamps due to the influence of the Atlantic Ocean, Qua Iboe River, and the Cross Rivers, which traverse the length and breadth of the state. The state has two distinct seasons. The rainy season lasts from May to October, while the dry season lasts from November to April. However, in coastal areas, rain falls almost all year round. The harmattan accompanied by the northeastern wind occurs in December and early January. The climate of the state allows for favorable cultivation and extraction of agricultural and forest produce such as palm, rubber, cocoa, rice, cassava, yam, plantain, banana, maize and timber. There are two types of agriculture in Akwa Ibom State. The first is small-scale peasant farming usually practiced on family basis, and which produce food crops, such as cassava, maize, and yam, for family consumption with the surplus sold in the local markets. The second type of farming is estate farming, which specializes in growing cash crops such as rubber, cocoa, rice, and oil palm.

The 2006 National Population and Housing Census put the population of Akwa Ibom State at 3,920,051. This study comprised 1,983,202 males and 1,918,849 females. The rural population for the same period was 3,121,641 while 780,410 constituted the urban population. The projected population for 2014 was 4,931,020, comprising 4,078,940 rural and 1,019,735 urban populations (Akwa Ibom State Government, 2014). The latest population data from the National Bureau of Statistics (2016) puts the population at 5,482,177. Approximately 60% of the population is agrarian and related employment, 25% is commercially oriented, and the remaining 15% constitutes the civil and public sectors. The state has 31 local government areas. The cities include Uyo, Ikot Ekpene, Ikot Abasi, Abak, Eket, and Oron.

The people of Akwa Ibom State are culturally homogenous with a common identity and are reputed to be the first settlers in the present-day South-Eastern Nigeria. People have a common linguistic heritage, which is a factor that is unifying. Besides Ibibio, which is the main language, there are other languages, such as Anang, Oro, Ibeno, Itu Mbonuso, and Adonis. Akwa Ibom State is a rural economy and largely agro-based, which is responsible for about 75% of the population's occupation. The people's major occupations are farming and fishing. Forestry-related activities, such as wood cutting and processing. The factors that favor agriculture in Akwa Ibom include a favorable year-round climate, abundant fertile soil, and coastal topography. The state's major agricultural products are yams, rice, cowpeas, maize, and cassava for subsistence living, while oil palm and cocoa are largely cash crops. Livestock activities, such as rearing of pigs, sheep, goats, and rabbits, are part of the people's occupation. There is also shrimping along the coast and deep-sea fishing. Mineral resource extraction is an important activity in the area, and crude oil extraction for petroleum products.

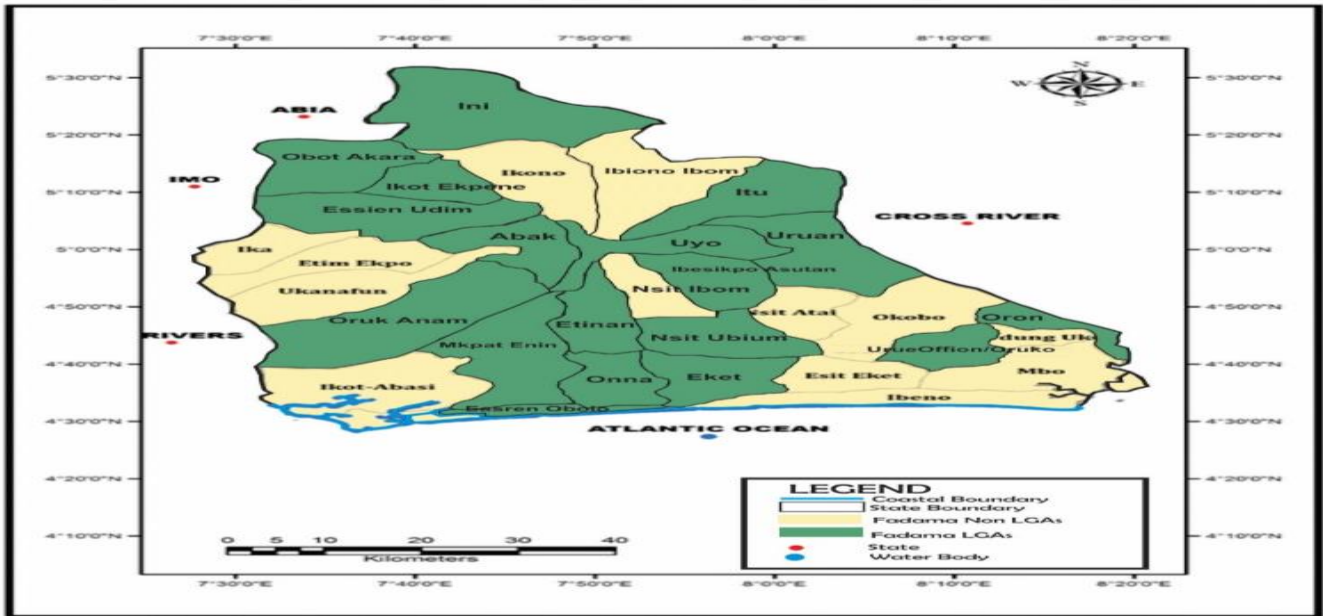


Figure 3.1: Map of Akwa Ibom State showing the study area

Source: Akwa Ibom State History, 2016

3.2 Sampling methods, data types, and collection procedures

Primary data were obtained using a questionnaire administered to farmers selected through simple random sampling. The sampling frame was obtained from the Fadama Coordination Office of Akwa Ibom State. The study used a sampling proportion of 30 based on the central limit theorem (CLT) to determine the appropriate sample size (Sheldom, 2017). A total sample size of 243 was estimated for the beneficiaries of the program. The study employed a purposive sampling technique to select 102 respondents who did not benefit from the program from Fadama-participating areas in Akwa Ibom State. A simple random sampling technique was also used to sample 100 non-beneficiaries from non-fadama participating areas in the state. Thus, the total study sample size was 443. However, only 400 copies of the questionnaire were valid for analysis.

Data Analysis Methods

Frequency distribution was employed to describe the socioeconomic characteristics of respondents, and the household commercialization index was used to estimate their market orientation. Comparisons of household commercialization index between beneficiaries and non-beneficiaries were conducted.

Market orientation

The impact of the National Fadama III project on the market orientation of beneficiaries was achieved using the household commercialization index for total agricultural production, as given by Equation 1. The index measures the ratio of the gross monetary value of crop sales by farmers *i* in year *j* to the gross monetary value of all crops produced by the same farmers in the same year *j* expressed as a percentage. The Food and Agriculture Organization (1989) categorized farmers into three different groups based on marketable surplus as a percentage of total production: subsistence farmers produce marketable surplus under 25% of total production, transition farmers produce marketable surplus ranging from 25% to 50% of total production, and commercial farmers produce marketable surplus of more than 50% of total production.

$$HCI_i = \frac{Gross\ Value\ of\ Crop\ Sales_{hhiyearj}}{Gross\ Value\ of\ All\ Crop\ Production_{hhiyearj}} \times 100 \quad (1)$$

Where:

HCI_i = household commercialization index of farmer i

Gross Value of Crop Sales $_{hhiyearj}$ = Gross monetary value of crop sales by farmers' households i in year j

Gross Value of All Crop Production $_{hhiyearj}$ = Gross monetary value of all crop produced by household of farmers i in year j

4.0 RESULTS AND DISCUSSION

4.1 Socioeconomic characteristics of Fadama III beneficiaries and non-beneficiaries

Age of the Farmers

The socioeconomic characteristics of beneficiaries and non-beneficiaries of Fadama III program in Akwa Ibom State is presented in Tables 1-6. Adesimi (1988) submitted that the level of management efficiency among a set of people has something to do with the socioeconomic behavior of the people. For instance, most farmers in the beneficiaries' category were in the age bracket 61-70 years with a mean age of 61 years. This would be expected to translate into high output since it is expected that the older farmers would have more farming experience than the younger ones. This is further supported by the fact that the beneficiaries of Fadama III farmers had more years of farming experience, with a mean of 33 years of farming experience being 33 years. Sherma et al. (2003) explained that with more experience, a farmer can become less averse to the risk implied by adopting new agricultural technology.

However, whether the findings on the age distribution of Fadama farmers in the study area would translate to higher output will depend on many factors, including the timely availability of other inputs, such as cuttings, fertilizer, land, seedlings, and labor, and on the ability of the farmers to effectively utilize the skills and knowledge acquired through the project. However, Emmanuel et al. (2006), Othman (2006), and Adeolu and Taiwo (2004) opined that farmers who participated in the different agricultural projects were relatively old, explaining that they might not be effective in utilizing the training that they receive from the project to improve their income-generating capacity and standard of living.

Table 1: Age distribution of beneficiaries and non-beneficiaries of Fadama III

Characteristic	Beneficiaries (n = 200)		Non-beneficiaries in the fadama areas (n = 100)		Non-beneficiaries in non- fadama areas (n = 100)	
	Frequency	Percentage (%)	Frequency	Percentage	Frequency	Percentage (%)
Age						
≤ 40	2	1	8	8	5	5
41-50	14	8	8	8	30	30
51-60	72	36	31	31	54	54
61-70	99	49.5	42	42	11	11
≥ 71	13	6.5	11	11	0	0
Maximum	78		79		69	
Minimum	32		30		35	
Mean	61		59		52	

Source: Field Survey of 2021

Education of Farmers

The majority of Fadama III farmers (69.5%) in the study area had secondary education. This was impressive as the level of education of the Fadama III farmers in the study area is a significant factor in the farmers’ ability to adopt new innovations and skills acquired from the project. Musa (2011) opined that education would significantly enhance farmers’ ability to make meaningful management decisions and enhance knowledge of improved farming methods, such as the use of improved recommended practices. It is impressive that up to 69.5% of the fadama III farmers in the study area have more than primary education. However, the question remains: Is this an important factor in enhancing agricultural production in the study area as expected? This might be true if all other agricultural production factors are made available at the right time and in the right quantity and effectively managed.

Table 2: Distribution of beneficiaries and non-beneficiaries of Fadama III by educational level

Characteristic	Beneficiaries (n = 200)		Non-beneficiaries in the fadama areas (n = 100)		Non-beneficiaries in non fadama areas (n = 100)	
	Frequency	Percentage (%)	Frequency	Percentage	Frequency	Percentage (%)
Educational level						
No formal education	0	0	2	2	4	4
Secondary education	139	69.5	50	50	72	72
Primary education	40	20	39	39	20	20
Tertiary education	21	11	9	9	4	4

Source: Field Survey of 2021

Source of land for cultivation

The primary source of land for cultivation in the study area, in all the categories of beneficiaries of Fadama III and non-beneficiaries of Fadama III, is through inheritance. Generally, plots are allocated to married sons and unmarried children are allocated plots at their own request only in rare cases. This action is usually seen as a mark of the son’s independence and to assist him in starting off with a good asset base. This is evident by the fact that most of the farmers in the study area (70%) were married and practiced farming as their primary occupation. This explains that these farmers were saddled with family responsibilities and, as such, will take their means of livelihood seriously to live a better and quality life. The findings agree with Musa (2011).

Table 3: Distribution of farmers by land source for cultivation

Characteristic	Beneficiaries (n = 200)		Non-beneficiaries in the fadama areas (n = 100)		Non-beneficiaries in the non fadama areas (n = 100)	
	Frequency	Percentage (%)	Frequency	Percentage	Frequency	Percentage (%)
Source of land of the respondents						
Rent	17	8.5	13	13	14	14
Purchase	18	9	0	0	10	10
Inheritance	154	77.3	87	87	76	76
Community	11	5	0	0	0	0

Source: Field Survey of 2021

Cultivated Farm Size

In addition, the farmers in the study area had an average farm size of 2 hectares. The majority of the farmers had farm sizes of 1-3 hectares. This is probably because their major source of land for cultivation is through inheritance. Plots acquired through this method are usually characterized by small fragmented plots, as the available plot(s) in a particular household will be shared with the sons who are members of that household. The small holdings of participants and non-participants indicate that farmers operate on a small scale.

Table 4: Distribution of farmers by cultivating farm size

Characteristic	Beneficiaries (n = 200)		Non-beneficiaries in the fadama areas (n = 100)		Non-beneficiaries in the non fadama areas (n = 100)	
	Frequency	Percentage (%)	Frequency	Percentage	Frequency	Percentage (%)
Farm size						
>1-3	183	92	93	93	100	100
4-6	15	7	7	7	0	0
≥ 7	2	1	0	0	0	0
Maximum	7		4		2	
Minimum	0.5		0.5		0.25	
Mean	2		2		2	

Source: Field Survey of 2021

Sex of the respondents

Though, widely documented by a number of researchers such as Oluweo (2013), Babatunde and Atlanda (2017), Othman (2006) that a large percentage of the farming population are male, the findings of this study reveal that Fadama III farmers had more female participating in farming than their male counterparts. This is probably because the project was designed to accommodate more females than their male counterparts. Discussants in the focus group discussion reported that a substantial number of women participated in the project. This was made possible by creating FCAs specifically for females, especially those belonging to vulnerable groups, such as

widows. These findings agree with those of Adeolu and Taiwo (2004), who examined the impact of the National Fadama facility in alleviating rural poverty and enhancing agricultural development in South Western Nigeria and indicated that there were more female participants than male participants.

Table 5: Distribution of Farmers by Gender

Characteristic	Beneficiaries (n = 200)		Non-beneficiaries in the fadama areas (n = 100)		Non-beneficiaries in the non fadama areas (n = 100)	
	Frequency	Percentage (%)	Frequency	Percentage	Frequency	Percentage (%)
Sex						
Male	90	45	52	52	56	56
Female	110	55	48	48	44	44

Source: Field Survey of 2021

Farm Household Size

The average household size in this study is 4 for participants of Fadama III and non-participants of Fadama III. There have been mixed reports on the size of farm households. Abdullahi (2010) indicated that the mean household size for both participants and non-participants of agricultural projects was about 9 persons per household. This tallied with that reported by the International Fund for Agricultural Development (2001) for the study area. This implies that the respondents can utilize family labor; hence, the larger the household size, the more family labor is used. A smaller number of households implies a reduction in the availability of family labor, thus encouraging the use of hired labor in the study area.

Table 6: Distribution of farmers by household size

Characteristic	Beneficiaries (n = 200)		Non-beneficiaries in the fadama areas (n = 100)		Non-beneficiaries in the non fadama areas (n = 100)	
	Frequency	Percentage (%)	Frequency	Percentage	Frequency	Percentage (%)
Household size						
1-5	166	83	82	82	80	80
6-10	32	16	18	18	20	20
>11	2	1	0	0	0	0
Maximum	12		8		9	
Minimum	1		2		2	
Mean	4		4		5	

Source: Field Survey of 2021

Farmers' Market Orientation

Tables 7-10 presents the household commercialization index of beneficiaries and non-beneficiaries of Fadama III in Akwa Ibom State. The household commercialization index was measured as a percentage of the gross value of

total crop production to the gross value of crop sales. The Food and Agriculture Organization (FAO, 1989) categorized farmers into three groups based on marketable surplus as a percentage of total production: subsistence farmers produce marketable surplus under 25% of total production, transition farmers produce marketable surplus ranging from 25% to 50% of total production, and commercial farmers produce marketable surplus of more than 50% of total production. On this basis, the result in Table 7 revealed that, for the category of Fadama III beneficiaries, 13.5% of the respondents produced a marketable surplus of less than 25% of total production, while the majority (69.8%) of the respondents produced a marketable surplus of more than 50% of total production. Meanwhile, only 16.5% of the respondents produced a marketable surplus ranging from 25% to 50% of total production, with a mean marketable surplus of 60.3%, and the highest marketable surplus for this category was 97%. Similarly, for respondents in the non-beneficiaries' category in Fadama local government areas in Table 8, majority (57%) of the respondents produce a marketable surplus ranging from 25-50% of total production, 33% produce a marketable surplus of more than 50% of total production, and 10% produce a marketable surplus of less than 25% of total production. Furthermore, for the non-beneficiaries in the non-fadama local government areas category in Table 9, majority (60%) of the respondents produce a marketable surplus ranging from 25-50% of total production, and 24% and 16% of the respondents produce a marketable surplus ranging from 25-50% of total production and <25% of total production, respectively.

The implication is that, for the fadama III beneficiaries' category, 69.8% of the respondents were commercial farmers compared with 33% and 24% for the non-beneficiaries in the fadama LGAs category and non-beneficiaries in the non-fadama local government areas category, respectively. Non-Fadama farmers in Fadama LGAs had a larger percentage of commercial farmers than non-Fadama farmers in non-Fadama LGAs. This is a result of the spill-over effects in the participating Fadama LGAs. The majority of non-Fadama farmers are transitioning from subsistence to commercial agriculture. The findings of this study are in agreement with those of Benin et al. (2007), who reported that the national agricultural advisory services (NAADS) program had a substantial positive impact on the commercialization index of farming households who participated in it compared with non-participating households. The beneficiaries of the fadama III project were found to be more market oriented than the non-beneficiaries of the project. Discussions with the farmers during the FGD revealed that they were able to have more access to the market partly because of the extension services provided by the project. This finding is consistent with the evolving evidence that an extension intervention featuring agro-dealers, demonstration plots, and lead farmers contributes to a statistically significant increase in access to information on both agricultural input and output markets (Kijima et al., 2012; Latynskly and Berger, 2017). In addition, amongst the small-scale community-owned infrastructures expected to be provided by the project to beneficiaries, the majority of respondents who benefitted from the project agreed that they benefitted more from access to market stalls provided by the project. Notwithstanding, the non-beneficiaries of the project in Fadama LGAs were more market oriented than those in non-fadama participating LGAs. This could be due to the spillover effects. However, most of the non-beneficiaries in fadama and non-fadama participating LGAs were transition farmers. This finding coincides with Mulubrhan et al. (2022), who revealed that InovAgro VCIs had a positive and significant effect on beneficiary households' access to information on agricultural input and output markets. Discussions with respondents during the focus group discussion acknowledged increased output commercialization. They revealed that an increase in the share of crop output sold was partly driven by the project's production inputs and extension services. They also ascertain that the high demand for farm produce and the price offered for the crop by traders are what has motivated farmers to produce more and hence, sell more. Notwithstanding, FGD participants for the

beneficiary’s category disclosed that they sell their produce from farms to intermediaries because the Fadama project has also helped them access premium markets.

Table 7: Distribution of Fadama Farmers according to the Household Commercialization Index

HCI	Fadama III Farmers	
	Frequency	Percentage
<25%	27	13.5
25-50%	34	16.5
>50%	139	69.8
Total	200	100
Mean	60.3	
Highest	97.0	

Source: Field Survey of 2021

Table 8: Distribution of Non-Fadama Farmers in Fadama Local Government Areas by Household Commercialization Index

HCI	Non-Fadama III Farmers in Fadama Local Government Areas	
	Frequency	Percentage
<25%	10	10
25-50%	57	57
>50%	33	33
Total	100	100
Mean	57	
Highest	57.0	

Source: Field Survey of 2021

Table 9: Distribution of Non-Fadama Farmers in Non-Fadama Local Government Areas by Household Commercialization Index

HCI	Non-beneficiaries of fadama III in non-fadama LGAs	
	Frequency	Percentage
<25%	16	16
25-50%	60	60
>50%	24	24
Total	100	100
Mean	56	
Highest	56.0	

Source: Field Survey of 2021

Table 10: Distribution of Respondents according to the Household Commercialization Index

Source: Field Survey of 2021

HCI	Beneficiaries of Fadama III		Non-Beneficiaries of Fadama III in LGAs		Non-beneficiaries of Fadama III in non-fadama LGAs	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
<25%	27	13.5	10	10	16	16
25-50%	34	16.5	57	57	60	60
>50%	139	69.8	33	33	24	24
Total	200	100	100	100	100	100
Mean	60.3		57		56	
Highest	97.0		57.0		56.0	

CONCLUSION

To assess the impact of the National Fadama Development Project III program on the market orientation of benefiting farmers in Akwa Ibom State, this study compared their commercialization with those of non-beneficiaries. The study revealed that the beneficiaries of fadama III were more market oriented than their non-beneficiaries' counterparts due to the small-scale community-owned infrastructure and training they received. However, non-beneficiaries in Fadama participating areas were more market oriented than those in non-fadama participating areas because of spillover effects. The household commercialization index also leaves substantial room for improvement. Improvements are required to make more efficient use of farm and planting materials resources to improve their yield, improve their market orientation, and fill these substantial gaps.

RECOMMENDATIONS

Therefore, it is recommended that more programs that focus on orienting the market orientation of farmers toward commercialization be implemented in the study area. Such programs, as observed in the case study of Fadama III program, are capable of causing positive spill-over effects in farmers who may not have participated directly. The results will help fill the market orientation gaps as more transiting farmers become commercialized.

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