

The Impact of IFAD-Value Chain Development Programme to Rice Yield and Income Among Smallholder Farmers in Ardo-Kola LGA, Taraba State, Nigeria

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ABSTRACT

The study assesses the impact of IFAD-VCDP on rice yield and farmers' income, as well as constraints to IFAD-VCDP implementation in the study area. A purposive sampling method was adopted to select 220 rice farmers. Primary and secondary data were used. Questionnaires were used to collect information from the beneficiaries of the programme. The respondents verified the claims of the programme with respect to the provisions of farm inputs, extension service and basic infrastructures. A paired-samples *t*-test was used to analyze the data. The findings of the study revealed that 55% of the respondents have yields between 1–10 bags (100kg) and after the intervention, 52% of the respondents had yield of 61–80 bags (100kg). Similarly, 43% of the respondents have income between ₦51,000–₦70,000 before the intervention programme and after the intervention, 52% of the respondents have income between ₦141,000–₦170,000 and 42% have between ₦171,000–₦200,000. This shows significant positive impacts on crop yield and income. The results of the paired-sample *t*-test show that there is difference in the mean income of rice farmers before IFAD-VCDP intervention ($M = 2.54$, $SD = .81$) and after IFAD-VCDP intervention ($M = 4.35$, $SD = .59$) at the .05 level of significance ($t = 27.25$, $df = 219$, $n = 220$, $p < .05$, 95% CI for mean difference 1.68 to 1.94). Given the positive impact of the IFAD-value chain development programme on rice farming in the study area, there is a need to extend it to other rice-producing LGA in Taraba State.

Keywords: Ardo Kola, IFAD, Rice farming, Smallholder farmers and VCDP.

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INTRODUCTION

Nigeria has a wide range of climatic, vegetation and soil conditions suitable for rice and diverse agricultural production. It has a total land area of 923,770 square kilometers, out of which 13,000 square kilometers is water with 910,770 square kilometers of land (NBC, 2009). Forty-four percent (44%) of the land area is under permanent pasture, thirty-three percent (33%) under arable crop, twelve percent (12%) under forest and woodland, three (3%) under permanent crop (Library of Congress, 2008). The country is endowed, not only with veritable agricultural land and natural resources but with varied climate that is equatorial in the south, tropical in

the center and arid in the north. The diversity of species of plants and animals is indispensable for both domestic consumption and export. Agriculture remains the leading sector in terms of employment in the Nigerian economy. Agriculture constitutes about 75% of the rural economic activities and contributes about 40% to the GDP (FMARD, 2012).

Before the advent of oil discovery in Nigeria, the economy was basically agrarian. Agriculture was the springboard of Nigeria's economic development from 1900 to the 1960s. Agriculture was contributing more than sixty percent (60%) to the GDP with Nigeria as a

major exporter of cotton, groundnut, cocoa, rubber and oil palm, in addition to being a major source of foreign exchange.

With the emergence of oil revenue in the 1970s, additional impetus was given to the development of the manufacturing sector, which grew at a very rapid rate of 15% per annum. Within the same period, export of petroleum has gained momentum and started to replace export-agriculture as a source of government revenue. Thus in the 1970s, leading sectors emerged; agriculture, manufacturing and petroleum. However, despite its displacement by petroleum, as a source of government fund, agriculture still remains the most important sector of Nigeria's economy due to the following reasons: First, petroleum export remains the exclusive preserve of government, as its main source of income. Secondly, the manufacturing sector contributes very little to the economy, as more than 70% of the proceeds are sent abroad as a factor payment (Meyer-Stamer and Wältring, 2017).

Nigeria's dependence on oil export alone made the economy vulnerable and susceptible to shocks generated by international oil prices. The collapse of oil prices of the 1980s was the beginning of Nigeria's economic problems. Revenue from oil export declined from \$20 billion in 1980 to \$10 billion in 1982. This led to Nigeria's inability to pay its short-term debts and purchase essential imports. Management is critical to sustaining a quality economy (Akkaya et al., 2021;). The economy, which has already been weakened by corruption and mismanagement, sunk into severe recession (Alkali, 1997) and Nigeria became a major food importer. Nigeria's food import bill rose steadily from ₦24 million in the mid-1950s to ₦47million, ₦126 million, ₦2 billion and ₦7 billion in 1960s, 1970s, 1980s and 1990s respectively. By the year 2011, the import bill for wheat, rice, sugar and fish put together reached ₦1.31 trillion (FMARD, 2012). Nigerian rice imports account for about US\$1.65 billion, or ₦0.59trn. Most of the country's rice is imported from Thailand and India. This has led analysts to predict it will be the world's second-largest importer of rice after China in 2019 (Rahman, 2019). Nigeria occupied the 13th position among the 20 poorest countries in the world, despite its 5th position among the richest world oil producers and exporters (Odumade, 2018). Sabair (2008) reported that Nigeria spends about 100 billion Naira (454 million USD) on rice importation annually.

A number of agricultural intervention programmes such as Rural Financing (RUFIN) and Fadama III were initiated and implemented, especially since Nigeria's return to democratic rule in 1999. The cumulative effect of the interventions led to the economic growth of about 6.9% and agricultural growth of 8.2% in 2008 (FMAWR, 2008), but failed to reduce poverty and youth unemployment to any appreciable level. By 2010,

poverty was by any measure, more severe and devastating than it was thirty years ago (NBS, 2012). The failure of these interventions (RUFIN and Fadama III) was attributed to an inherent weakness in the strategy of increasing productivity of the small scale farmers, without taking cognizance of the role of the market on the poor. In contrast, the value chain approach is a market-oriented approach that starts by identifying and then responding to changing customer needs. It is also a strategic network of individuals, independent organizations and businesses that work together, share the associated risks and benefits, and invest time, energy and resources to make the relationship work. This influenced the Federal Ministry of Agriculture and Rural Development to adopt the value chain approach, as the operational strategy for the implementation of the Agricultural Transformation Agenda (ATA) of the last administration's transformation agenda (FMARD, 2012). The Federal Government of Nigeria received a credit line from the International Fund for Agricultural Development (IFAD) towards the cost of implementing a 6 years FGN/IFAD assisted Value Chain Development Programme in 6 states of Anambra, Benue, Ebonyi, Niger, Ogun and Taraba State, and in 5 LGAs of each of the selected states bringing the total number of participating LGAs in Nigeria to 30 (IFAD, 2015).

The programme was approved for a loan of 104.4 million USD on 26 October 2012 and since then, the programme implementation has progressed at all levels. The programme aims to directly improve the livelihoods of approximately 17,480 households (15,000 smallholder households, 1680 processors and 800 traders) and to benefit indirectly approximately 22,000 households in the 6 selected states, one from each geopolitical zone of Nigeria (IFAD, 2015).

The IFAD-Value Chain Development programme focuses on enhancing the productivity and profitability of smallholder farmers cultivating up to 5 hectares of land, processors and traders by improving their access to markets, and capacity to increase yields as well as add value to locally produced raw materials through improved processing and packaging. Its primary goal is to reduce poverty and sustainably enhance accelerated economic growth. The entry point to the programme is through organized groups of producers and processors, with particular attention to both women and youth groups (IFAD, 2015).

The IFAD-VCVP has been in operation for about 6 years now in Taraba State (2015 – 2021), empowering smallholder farmers with inputs, assets and new agronomic practices. However, it is not clear if the programme has solved the problem of increase in rice yield and rice farmers' income in the study area or not. Therefore, the aim of this study is to examine the impact of IFAD-Value Chain Development Programme on rice yield and farmers' income in Ardo-kola LGA. It is against

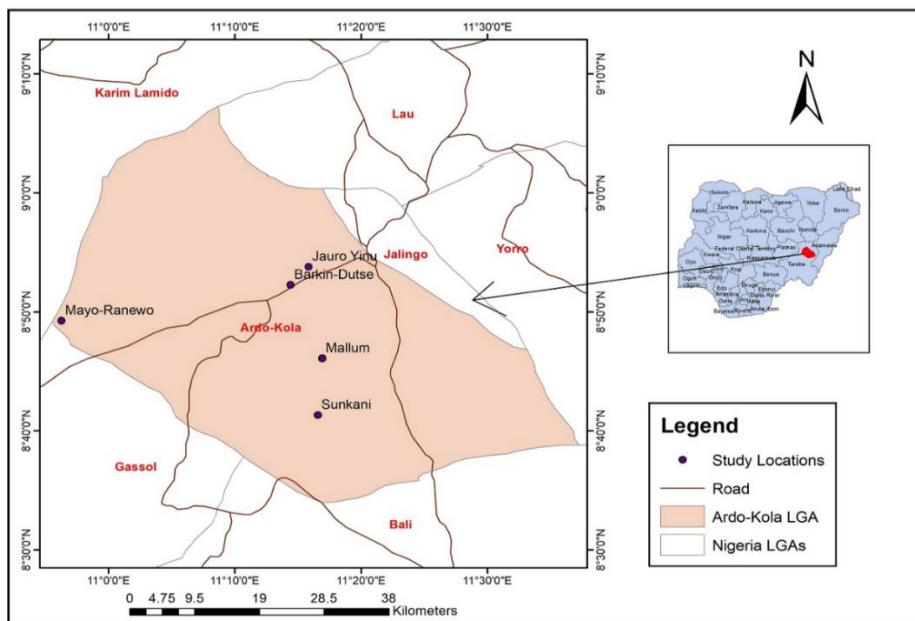


Figure 1. Map of the Study area.

this background that this study investigates the impact of IFAD-VCDP on rice yield and farmers' income in Ardo-kola LGA of Taraba State, Nigeria.

METHODOLOGY

Description of Study Area

Ardo-kola LGA the study is located in the Northern Senatorial District of Taraba State, North-Eastern Nigeria with Sunkani as its headquarter (Figure 1). It covers a total area of 2,312 square kilometers. Ardo-kola LGA is located in latitude 8°00'N to 9°40'N and longitude 11°00'E to 12°00'E of the Greenwich meridian. It borders Jalingo LGA to the east, Gassol LGA to the west, Karim Lamido LGA to the north and Bali LGA to the south. Ardo-kola LGA is located in the basement complex region surrounded by several mountains, comprising a number of towns and villages such as Iware, JauroYinu, Mallum, Sunkani, Lamido-Borno, Alim-Gora, Tau, Zongon-kombi, Mayoranewo and Bakin-Dutse. Ardo-kola LGA has a projected population of 137,830 inhabitants in 2021 (NPC, 2006, projected at 3% growth rate from 2006 to 2021).

Ardo-kola LGA is predominantly agrarian in nature. The predominant population of the study area engages in farming as an occupation. Few are civil servants, and about 3 quarters of the people are crop farmers, livestock farmers, fishermen, while about one quarter are engaged in other economic activities (Oruonye and Bashir, 2011).

The youthful population and the agrarian nature contribute immensely to the success of rice farming in the study area.

Ardo-kola LGA has two distinct seasons; the rainy and the dry seasons. The rainfall distribution pattern in the state shows a decrease from the South to the Northern part. The rainfall duration lasts 190 days in Northern part of the state (Oruonye and Bashir, 2011). Ardo-kola LGA also experiences high temperatures all year round because of its latitudinal location. Maximum temperature ranges between 24°C to 39°C. The highest temperature is recorded in March and April. The minimum temperature is 13°C and is recorded in the months of December to January (Oruonye and Bashir, 2011).

The study adopted the survey design method. Primary and secondary data were used in this study. The primary data was collected using a questionnaire and interviews which were used to elicit information on the farmers' perceptions of the impact of IFAD-VCDP on rice yield and rice farmers' income in the study. Sampling was used in selecting 5 wards out of 10 wards in the LGA. The selected wards were Mayo Ranewo, Sunkani, Bakin-Dutse, Mallum and Jauro-Yinu. The study adopted purposive sampling method in selecting 220 respondents. The purposive sampling enables the selection of target rice farmers that belong to registered farmer's cooperative societies and who are residents in the selected wards. The respondents through the questionnaire and interviews were able to provide information on IFAD-VCDP intervention with respect to

Table 1: Demographic and Socioeconomic Characteristics of Rice Farmers (Respondents).

| OPTIONS | FREQUENCY | PERCENTAGE |
|-------------------------------|-----------|------------|
| Gender | | |
| Male | 156 | 70.9 |
| Female | 64 | 29.1 |
| Marital Status | | |
| Single | 46 | 20.9 |
| Married | 174 | 79.1 |
| Educational Attainment | | |
| Primary | 146 | 66.4 |
| Secondary | 74 | 33.6 |
| Tertiary | 00 | 00 |
| Adult Education | 00 | 00 |
| Source of Farm Land | | |
| Self-owned | 160 | 72.7 |
| Rented | 38 | 17.3 |
| Borrowed | 22 | 10 |
| Farm Size (Hectare) | | |
| 1 hectare | 9 | 4.1 |
| 2 hectare | 22 | 10.0 |
| 3 hectare | 117 | 53.2 |
| 4 hectare | 29 | 13.2 |
| 5 hectare | 43 | 19.5 |

Source: Fieldwork, 2019.

the provisions of services such as training, extension service, fertilizer and other farm inputs, water supply, construction of feeder roads, market stores, and aggregation centers in their localities. The data were analyzed using descriptive statistics. A paired-sample *t*-test was used to test the differences in rice yield and farmer's income before and after the intervention of IFAD-VCDP in the study area.

RESULTS

Demographic and Socioeconomic Characteristics of Respondents

The study included 220 farmers. The demographic characteristics of rice farmers in the study area are presented in Table 1. The result revealed that 71% of the respondents were males while 29% were females. On marital status, the finding shows that 79% of the respondents are married, while 21% are single. This finding is in agreement with that of Kadiri (2014) whose study in the Niger Delta region of Nigeria revealed that 70% of rice farmers were married. The high percentage of married respondents could be attributed to the fact that most married people have varying needs and responsibilities for which farming activities and the income generated through such activities help in meeting their needs. Married people have more responsibilities for their families compared to those who are single that

make them involve in income-generating activities to cover family responsibilities. This finding, thus, shows that involvement in rice farming has been a major source of income for meeting family needs among farmers. The implication of this is that, as more families get involved in rice farming, their lots become improved.

The findings of this study on the educational attainment of rice farmers revealed that 65% had attained a primary level of education. This finding is in agreement with the study on the technical efficiency of rice farmers in Northern Ghana by Seidu (2008). Seidu (2008) studied two categories of rice farmers which are the irrigators and non-irrigators. The farmers had 8 years as average years of formal education for both farm groups. The mean years of education show that on average, the highest level of education attained by a farmer is primary school, which revealed a low literacy level among rice farmers in Northern Ghana. The implication of this is that agricultural productivity in this region will be low due to the level of education which plays a significant role in the adoption of new technology by farmers. Onu and Edon (2009) revealed that education has a significant impact on farmers' efficiency. It also influences farmers understanding of climate change, diseases and pests control as well as socio-economic policies and factors affecting farming activities.

The land ownership by respondents in the study area ranges from leased (17%), borrowed (10%), and self-owned (73%). The findings show that the sources of land by respondents vary among the farmers, while majority

Table 2: IFAD-VCDP Intervention in the Study Area.

| Supports Received | Frequency | Percentage |
|-------------------------------|------------|------------|
| Farm Inputs | 72 | 32.7 |
| Farm Assets | 24 | 10.9 |
| Extension Service | 66 | 30.0 |
| Infrastructural Support | 26 | 11.9 |
| Training/Capacity Development | 32 | 14.5 |
| | 220 | 100 |

Source: Fieldwork, 2019

of the land is self-owned. This finding is in agreement with the study by Ajah and Nmadu (2012) on farmers' access to farm inputs. The minimum and maximum size of hectares cultivated in the study area ranges from 1 to 5 hectares. 52% of the respondents reported having a farm size of 3 hectares and 19% of respondents have 5 hectares. The other respondents representing 10% and 4% have 2 hectares and 1 hectare respectively. This implies that most of the respondents have farm sizes of between 3 to 5 hectares which are in line with the programme's mandate of enhancing the productivity and profitability of smallholder farmers in cultivating up to 5 hectares of land.

IFAD-VCDP Intervention in the Study Area

The areas of intervention of IFAD-VCDP in rice farming in the study area range from provision of farm inputs, extension service, infrastructural support, training and capacity development as shown in Table 2.

The result of the findings revealed that there is higher support in terms of farm inputs as represented by 33% and training/capacity development representing 30%. The other forms of support came in the form of assets 11%, extension service 12% and infrastructural support representing 14%. The provision of farm inputs/extension services is one of the core objectives of IFAD-VCDP to educate rice farmers on the improved method of rice farming.

IFAD value chain development programme also provided infrastructures such as pipe bore water, aggregation center, storage facilities, market shops and machineries which has improved the farming activities of the rice farmers in the study area. Adaptable technologies such as urea deep placement, bonding and transplanting have also been successfully transferred to rice farmers in the study area thereby increasing their crop yield and consequently their income.

The IFAD-VCDP programme provided 10 extension agents for Taraba State (2 extension agents for each selected LGA). Thus, the 2 extension agents deployed to the study area were able to transfer knowledge and adaptable technology to most of the farmers through the

use of contact farmers from various farmer's organization in the study area. The contact farmers were chosen based on certain criteria such as literacy level (primary school and secondary education.), active participation/membership in local farmer organizations, interest in farming (innovative and adventurous), good communication in English or Hausa language, ability to coordinate, and accessibility of farm (close to the roadside). The extension agents introduced demonstration plots where old farming practices were displayed on one part of the farm, while the new improved farming systems are displayed on the other part of the same farm. The side-by-side display of the old and new farming practices allows for comparison which generated awareness and interest in other members of the community leading to the acceptance and trial of the new technique.

Findings of the study reveal that 33% of the respondents received farm inputs in form of fertilizer (NPK and Urea), improved rice seeds (Faro 44 and 52 varieties) and herbicides (Glyphosate and Solito), while 11% of the respondents claimed that they received farm assets in form of knapsack sprayer, tractor (John Deer 5503 model), thresher, power tiller and pumping machine for dry season farming. The infrastructural support provided by the programme as claimed by the respondents includes an aggregation center at Sunkani town, market stores/stalls at Bakin-dutse and boreholes at Mayo Ranewo and Sunkani. The 30% of the respondents who benefitted from IFAD-VCDP extension services (Table 2) revealed that the services provided include transplanting of rice seedling from nursery bed to the farmlands, training on Urea Deep Placement (UDP), bonding, bird scaring system, fencing, herbicide/fertilizer application, use of improved seeds, and nursery establishment.

The findings of the study reveal that the intervention of IFAD-VCDP in Ardo-kola LGA has contributed positively to rice yield and income of smallholder farmers in the study area. The programme operates with both primary and secondary target groups respectively. The primary target groups are poor rural households engaged in rice farming who cultivate not more than 5 hectares of land under rice and small-scale processors while the

Table 3: Crop Yield of Respondents Before and After IFAD-VCDP Intervention.

| Period | Yield (100kg Bags) | Frequency | Percentage |
|---------------|--------------------|------------|------------|
| Before | 1 – 10 | 122 | 55.5 |
| | 11 – 20 | 90 | 40.9 |
| | 21 - 30 | 8 | 3.6 |
| Total | 220 | 100 | |
| After | 41 – 60 | 14 | 6.4 |
| | 61 – 80 | 114 | 51.8 |
| | 80 & above | 92 | 41.8 |
| Total | 220 | 100 | |

Table 4: The paired-samples *t*-test result summary.

| | Paired Differences | | | 95% Confidence Interval of the Difference | | | | df | Sig. (2-tailed) |
|--------|--|-----------------------|------------------------|---|--------------|----------|--------|-----------|------------------------|
| | Mean | Std. Deviation | Std. Error Mean | Lower | Upper | t | | | |
| | | | | | | | | | |
| Pair 1 | Bags Harvested After IFAD-VCDP – Bags Harvested Before IFAD-VCDP | 2.87273 | .82328 | .05551 | 2.76333 | 2.98212 | 51.756 | 219 | .000 |

Source: Researcher's computation (SPSS 23.0)

secondary target groups include stakeholders, particularly processors linked to large number of primary target groups, local government councils and communities strengthened to sustainably manage the marketing infrastructures supported by the Programme and private sector operators strengthened to provide quality services demanded by smallholder farmers in the study area. The entry point for the programme is a registered group of rice farmers with special attention to women and youth groups. Implementation started with existing, strong or mature groups (in terms of governance, level of production, processing, and market linkages) while providing capacity building for weaker groups.

Contribution of IFAD-VCDP on Rice Yield

Hypothesis I: There is no significant difference in rice yield before and after the intervention of IFAD-VCDP in the study area.

The result of the findings on crop yield in the study area is presented in Table 3. Table 3 shows that 55% of the respondents claimed that they have yields between 1-10 bags (100kg), 41% reported yield of 11-20 bags (100kg), while 4% reported a yield of 21-30 bags (100kg). This shows an average return on investment for some farmers, while it could be a loss to others. The reason

behind this result can be attributed to poor method of rice farming. The responses on crop yield after the IFAD-VCDP intervention reveal that 52% of the respondent claimed to have recorded a yield of 61-80 bags (100kg). On the other hand, 42% of the respondents recorded a yield of 80 bags (100kg) and above. This shows that the intervention has a positive contribution to their crop yield and consequently their income as a result of the adoption of good agronomic practices such as rice transplanting and fertilizer/herbicides application.

The results of the paired-sample *t*-test in Table 4 shows there is difference in mean yield before IFAD-VCDP intervention ($M = 1.48$, $SD = .57$) and after IFAD-VCDP intervention ($M = 4.35$, $SD = .59$) at the .05 level of significance ($t = 51.756$, $df = 219$, $n = 220$, $p < .05$, 95% CI for mean difference 2.76 to 2.98). This shows that IFAD-VCDP intervention had a significant contribution to rice farming in the study area. Thus, the null hypothesis which states that there is no significant difference in rice farming yield before and after the intervention programme of IFAD-VCDP in Ardo-kola LGA of Taraba State is rejected at 5% significance level and the alternative hypothesis which states that, there is a significant difference in rice farming yield before and after the intervention of IFAD-VCDP in the study area is accepted as a result of the increase in rice yield and income of smallholder farmers in Ardo-kola LGA.

Table 5: Farmers Income Before and After IFAD-VCDP intervention.

| Period | Income (NGN) | Frequency | Percentage (%) |
|---------------|-------------------|------------|----------------|
| Before | 10,000 – 30,000 | 22 | 10 |
| | 31,000 – 50,000 | 80 | 36.4 |
| | 51,000 – 70,000 | 95 | 43.2 |
| | 71,000 – 90,000 | 23 | 10.5 |
| Total | | 220 | 100 |
| After | 111,000 – 140,000 | 14 | 6.4 |
| | 141,000 – 170,000 | 114 | 51.8 |
| | 171,000 – 200,000 | 92 | 41.8 |
| Total | | 220 | 100 |

Source: Data analysis

Table 6: The paired-samples *t*-test result for income

| | Paired Differences | | | | | t | Df | Sig. (2-tailed) | | |
|---|--------------------|----------------|-----------------|---|---------|--------|-----|-----------------|--|--|
| | Mean | Std. Deviation | Std. Error Mean | 95% Confidence Interval of the Difference | | | | | | |
| Farm Income After IFAD-VCDP – Farm Income Before IFAD-VCDP | | | | | | | | | | |
| Pair 1 | 1.81364 | .98704 | .06655 | 1.68248 | 1.94479 | 27.254 | 219 | .000 | | |

Source: Researcher's computation (SPSS 23.0)

Contribution of IFAD-VCDP on Rice Farmers Income

From Table 5 it was revealed that 43% of the respondents have income between N51,000 – N70,000 before the intervention programme. The other respondents have income between N31,000 – N50,000, N71,000 – N90,000 and N10,000 – N30,000 representing 36%, 11% and 10% respectively.

The response on income after IFAD-VCDP intervention indicates that 52% of the respondent claimed to have income between the range of N141,000 – N170,000, followed by 42% who claimed to have income between N171,000 – N200,000 after the IFAD-VCDP intervention programme. This finding is in agreement with the study of Abdullahi (2016) who worked on Comparative Economic Analysis of Faro 54 and Nerica 1 rice in selected LGA of Niger State, Nigeria, which indicated that the total revenue for Faro 54 and Nerica 1 rice varieties were N162,763 and N137,942 per hectares respectively. This indicates that the respondents' income before IFAD-VCDP intervention is poor compared to their income after the intervention as indicated by an increased number of bags harvested and consequently an increase in income.

Hypothesis II: There is no significant difference in farmer's income before and after IFAD-VCDP intervention in the study area.

The results of the paired-sample *t*-test in Table 6 show that there is difference in the mean income of rice farmers before IFAD-VCDP intervention ($M = 2.54$, $SD = .81$) and after IFAD-VCDP intervention ($M = 4.35$, $SD = .59$) at the .05 level of significance ($t = 27.25$, $df = 219$, $n = 220$, $p < .05$, 95% CI for mean difference 1.68 to 1.94).

Constraints to Effective Implementation of IFAD-VCDP in the study area

Table 7 shows that the major challenges to the effective implementation of IFAD-VCDP intervention programme include shortage of farm input according to 39% of the respondent. This could be attributed to the fact that IFAD-VCDP provided 50% of the farm inputs used while the other half was provided by the farmers themselves. Low technical know-how (26%), lack of funds (21%) and insecurity representing 13% were among the other challenges to the effective implementation of the programme in the study area. The most pertinent ones as indicated by the responses in Table 7 are shortage of farm input, low technical know-how and lack of funds.

Rice farmer's perception of IFAD-VCDP intervention in the Study Area

The result of the findings on rice farmer's perception of

Table 7: Constraints to effective implementation of IFAD-VCDP in the Study Area.

| Constraints | Frequency | Percentage (%) |
|-------------------------|------------|----------------|
| Insecurity | 29 | 13.2 |
| Low technical know-how | 58 | 26.4 |
| Lack of funds | 47 | 21.4 |
| Shortage of farm inputs | 86 | 39 |
| Total | 220 | 100 |

Source: Field work, 2019

Table 8: Rice farmer's perception of IFAD-VCDP Programme in the Study Area.

| Indices | Frequency | Percentage |
|------------|------------|------------|
| Land | 72 | 32.7 |
| Input | 80 | 36.36 |
| Harvesting | 30 | 13.63 |
| Processing | 18 | 8.18 |
| Packaging | 20 | 9.09 |
| 220 | 100 | |

Source: Field work, 2021

IFAD-VCDP programme in the area of land, input, harvesting, processing and packaging is shown in Table 8.

Table 8 showed that the programme had benefitted rice farmers in the study area through the accessibility of farmland (32.7%), provision of farm inputs 36.36%, harvesting equipment 13.63%, processing equipment 8.18% and packaging 9.09%. Other areas the farmers benefitted from the programme include increased crop yield and income. This finding agrees with that of Alufohai et al.(2015) who noted that IFAD-VCDP programme helps to improve the livelihoods of beneficiaries in the areas of land ownership, renting and borrowing, input, harvesting, processing and packaging as a direct result of enhanced productivity and income. The intervention of IFAD-VCDP in Ardo-kola LGA has empowered rice farmers especially, those that belong to an organized cooperative society, through which they can access extension services and farm inputs. Rice farmers now have better access to credit facilities which was made easier through partnerships with financial institutions, as well as receiving training from IFAD-VCDP extension agents to develop their financial literacy and agribusiness skills necessary to engage with the market and supply the required quantity of rice. These results reveal that the beneficiaries were generally satisfied with the IFAD – VCDP programme.

Conclusions

The findings of the study reveal that IFAD-VCDP

interventions have contributed positively to rice farming in the study area. The results of the paired-sample t-test show that there is difference in the mean income of rice farmers before IFAD-VCDP intervention ($M = 2.54$, $SD = .81$) and after IFAD-VCDP intervention ($M = 4.35$, $SD = .59$) at the .05 level of significance ($t = 27.25$, $df = 219$, $n = 220$, $p < .05$, 95% CI for mean difference 1.68 to 1.94). This positive contribution was as a result of IFAD-VCDP engagement of 10 extension agents for Taraba State (2 extension agents for each selected LGA), provision of farm inputs such as fertilizer (NPK and Urea), improved rice seeds (Faro 44 and 52 varieties) and herbicides (Glyphosate and Solito), knapsack sprayer, tractor (John Deer 5503 model), thresher, power tiller and pumping machine for dry season farming. The interventions also included an infrastructural support aggregation center at Sunkani town, market stores/stalls at Bakin-dutse and boreholes at Mayo Ranewo and Sunkani. The study found that the major challenge to the effective implementation of IFAD-VCDP includes shortage of farm input, low technical know-how, insecurity in the local communities and lack of funds. The study concluded that despite the challenges, the programme has sustainably increased crop yield and income of smallholder farmers in the study area.

RECOMMENDATIONS

Based on the findings, the study made the following recommendations;

- I. There is a need to involve rice farmers in the operation

and maintenance of basic infrastructures provided by IFAD-VCDP. It will stimulate the interest of the programme beneficiaries and host communities in the maintenance of the facilities provided.

ii. Since the programme has contributed positively to rice yield and farmers' income in the study area, there is need to

extend it to other rice-producing LGAs in the State.

iii. Private extension service providers should be engaged to complement the number provided by the programme so as to improve the transfer and adoption of new innovations by farmers.

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