Effect of International Fund for Agricultural Development-Value Chain Development Programme on Poverty Status of Small-Scale Rice Farmers in Niger State of Nigeria

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Abstract

This study determined the effect of International Fund for Agricultural Development-Value Chain Development Programme (IFAD-VCDP) on poverty status of small scale rice farmers in Niger State. Multistage random sampling technique was used to sample respondents from 18 villages and 36 farmers' cooperative groups made up of 110 participants, 90 spill-over and 95 control groups. The data was analyses using descriptive statistics and Foster Greer and Thorbeck(FGT) model. The result showed the poverty line of N455,546.36, N351,802.88 andN398,913.90 for participants, non-participants and pool rice farmers respectively. The poverty gaps were 8.69 percent, 25.02 percent and 24.65 percent for participants non-participant and pool rice farmers in the study area respectively while severity index was 1.53 percent for participants, 8.71 percent for non-participants and 9.18 percent for pooled rice farmers. It was therefore recommended that government at all levels should not default in payment of counterpart contribution so as to ensure sustainability of the programme.

Keywords*: Value chain, Poverty, Rice farmers*

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Background to the Study

In Africa, the agricultural sector provides employment for more than 80% of the population, yet 70 percent of the staple food is produced by small scale farmers (Middelberg, 2016). In Nigeria, small scale farmers make up 85 percent of the farming population which represent 14 million households (SAHEL, 2017). The implication is that production is largely at subsistence level. Due to inadequate financing, farmers do not usually use the latest technologies to boost production. They rather increase the land size used for production. Therefore, one of the major problems of agriculture in Nigeria is insufficient or lack of adequate financial support to small scale farmers Price Water House Coopers (PWC, 2017).

In an effort to further boost agricultural production of Nigerian farmers, the Federal Ministry of Agriculture and Rural Development (FMARD) (2016) asserted that the country ought to partner with private investors across farmer groups and companies in order to develop end to end value chain solutions. These chains will receive facilitated government support as they make deep commitments to engaging new generation of farmers improve supply of specialized fertilizers and protection chemicals, as well as wider scale use of high yielding seeds. A value chain is a set of linked activities that work to add value to a product: consisting of actors and actions that improve products while linking the commodity producers to the processors and markets (Norton, 2014).

Objective of the Study

The purpose of this study is to:
- i. Describe the socio-economic characteristics of rice farmers in the study area.
- ii. Determine the effect of IFAD-VCDP on poverty status of small scale rice farmers in Niger State.

Methodology

The Study Area

Niger State comprises of twenty-five (25) Local Government Areas (LGAs) and divided into three agricultural zones (I, II and II). The State is situated between latitudes $8^0 22'$N and $11^0 30'$N and longitudes $3^0 30'$E and $7^0 20'$E. Niger State has a total land area of 74,244km^2 which represents about 10 percent of the total land area of Nigeria and 85 percent of the land is arable (Niger State Bureau of Statistics, 2012). The state has an estimated human population of 3,950,249 (NPC, 2006) which was projected to be about 5,016,816 in 2016 with an annual growth rate of 2.7 percent (NBS, 2016). Most of the communities are predominantly agrarian who cultivate varieties of crops such as sugar cane, vegetables, groundnut, soya beans, rice, melon, cassava, sorghum, millet, shea butter, yam, cotton and cowpea. The inhabitants of the state also domesticate livestock like cattle, sheep, goats and chicken among others.

Sampling Techniques and Sample Size

Multi-stage random sampling technique was adopted in this study. The first stage involved the random selection of one participating LGA and one non-participating LGA that is 50-60 km away from the selected participating LGA in each of the three Agricultural zones in the state.

The second stage involved the random selection of two participating villages from the selected participating LGAs; non-participating villages (20-30km away from the selected participating villages) from the selected participating LGAs; and, random selection of two villages from the selected non-participating LGAs. The third stages involve random selection of two active farmers' co-operative association from each of the selected participating villages, non-participating villages from the selected participating LGAs and non-participating villages from the selected non-participating LGAs. The fourth stage involved the use of Cochran formulae to determine the representative sample size from the sampling frame or farmers' population list obtained from the IFAD-VCDP office.

Cochran's formula is given as

$$n_a = \frac{n_r}{1 + \frac{(n_r - 1)}{N}} \qquad (1)$$

But

$$n_r = \frac{(1.96)^2 pq}{e^2} \qquad (2)$$

Where:

n_a = adjusted sample size for finite population
n_r = sample size for infinite population
N = population size
p = proportion of population having a particular characteristic
q = 1 − p
e^2 = error gap

Thus, p = 0.01 and q = 1 − 0.01 = 0.99. Therefore, n_r was computed to be 15. This was substituted in equation (1) to determine the sample size.
In all a total of 110, 90 and 95 representative respondents for the treatment, spill-over and control respectively, were be randomly selected.

Table 1: Sampling frame participants and non-participants

Groups	LGAs	Villages	Number Farmer Group	Sample Frame	Sample Size
Participants	KATCHA	Baddegi	2	49	19
		Edostu	2	50	18
	SHIRORO	Baha	2	33	16
		Paigado	2	50	20
	WUSHISHI	Bankogi	2	38	17
		Kanko	2	50	20
		Sub-TotaL		**270**	**110**
Spillover Effect	KATCHA	Kangi Toga	2	35	17
		SheshiDama	2	33	16
	SHIRORO	Farindoki	2	35	17
		Zhikuchi	2	22	13
	WUSHISHI	Gwarijiko	2	26	14
		Fugangi	2	23	13
		Sub-Total		**174**	**90**
Control	LAPAI	Gbage	2	35	17
		Puzhi	2	30	15
	GURARA	Tufa	2	29	15
		Lambata	2	29	16
	MARIGA	Kahigo	2	37	17
		Bobi	2	33	16
		Sub-Total		**193**	**95**
		Grand- Total		**693**	**295**

Source: IFAD-VCDP farmer database and Niger State Agricultural Development Authority (NAMDA), 2018

Methods of Data Collection
Primary data was used for this study. It involved the use of well-structured questionnaire coupled with interview schedule to collect relevant first-hand information from the respondents.

Methods of Data Analysis
The study employed descriptive and Foster, Greer and Thorbecke (FGT) model to analyze the data collected.

Model Specification
Foster, Greer and Thorbecke (FGT) Model
The model proposed by Foster, Greer and Thorbecke of 1984 was used to measure poverty status. It is given as:

$$P_0 = \frac{1}{N}\sum_{i=1}^{N} I\,(y_i < z) \tag{3}$$

Where: P_0 = Headcount Index

N = Sample size

y_i = Income (₦)

z = Poverty line

I = Dummy variable (take the value of 1 if respondent's income lower than the poverty line and 0 other wise)

The Gap Index adds up the extent to which individuals on average fall below the poverty line, and expresses it as a percentage of the poverty line o. It is expressed as:

$$P_1 = \frac{1}{N}\sum_{i=1}^{N}\frac{G_i}{z}$$ (4)

$$\text{but} \quad G_i = (z - y_i) \; x \; I(y_i - z)$$

Where: G_i = Poverty Gap

The Severity Index is the squared values of Poverty Gap Index. It is a measure of poverty that takes into account inequality among the poor. It is denoted by:

$$P_2 = \frac{1}{N}\sum_{i=1}^{N}\left(\frac{G_i}{z}\right)^2$$ (5)

Thus, GFT model is given by:

$$P_\propto = \frac{1}{N}\sum_{i=1}^{N}\left(\frac{G_i}{z}\right)^\propto$$ (6)

Where α = 0, 1, 2 for Headcount, Gap and Severity Indices respectively (Haughton and Khandker, 2009)

Results and Discussion
Socio-Economic Characteristics of Small-Sale Rice Farmers
Socio-economic characteristics of the small-scale rice farmers considered were age, gender, household size, marital status and educational level.

Table 2: Distribution of the rice farmers according to socioeconomic characteristics

Variables	Participating (n=110) Freq. (%)	Non-Participating (n=185) Freq. (%)	Pooled (n=295) Freq. (%)
Age			
21 – 30	15 (13.64)	22 (11.89)	37 (12.54)
31 – 40	43 (39.09)	76 (41.08)	119 (40.34)
41 – 50	40 (36.36)	69 (37.30)	109 (36.95)
51 – 60	11 (10.00)	17 (9.19)	28 (9.49)
> 60	1 (0.91)	1(0.54)	2 (0.68)
Mean age (x)	40	41	40
Gender			
Male	107 (97.27)	174 (94.05)	281 (95.25)
Female	3 (2.73)	11 (5.95)	14 (4.75)
Household size			
1 – 5	24 (21.82)	34 (18.38)	58 (19.66)
6 – 10	67 (60.91)	100 (54.05)	167(56.61)
11 -15	16 (14.55)	45 (24.32)	61(20.68)
16 – 20	1 (0.91)	6 (3.24)	7 (2.37)
>20	2 (1.82)	0 (0.00)	2 (0.68)
Mean (x)	8	9	8
Marital status			
Single	4 (3.64)	4 (2.16)	8 (2.71)
Married	104 (94.55)	177 (95.68)	281(95.25)
Divorced	0.(0.00)	2 (1.08)	2 (0.68)
Widow/ widower	2 (1.82)	2 (1.08)	4 (1.36)
Educational status			
Primary	34 (30.91)	43 (23.24)	77(26.10)
Secondary	39 (35.45)	61 (32.97)	100 (33.90)
Tertiary	17 (15.45)	30 (16.22)	47(15.93)
Qura'anic	11 (10.00)	31 (16.76)	42 (14.24)
None	9 (8.18)	20 (10.81)	29 (9.83)

Source: Computed from field survey, 2018.

Age Distribution of the Rice Farmers

The result of age distribution of rice farmers in Table 2 shows that more than one quarter (39.09 percent) of the participants were within age range of 31 to 40 with the mean age of 40 years. The non-participants indicated 41.08 percent constituting almost half of the respondents were within the mean age of 41 years. The result also reveals that 13.64 percent of the participating farmers were aged between 21 to 30 years while 11.89 percent of farmers within the same age range were non-participants. Likewise, 10 percent of the participating farmers fell within the ages of 51 and 60 while 9.19 percent were non-participants. This implies that the IFAD/VCDP programme accommodates varying age ranges including young and old farmers.

The pooled result indicates that majority of rice farmers in the study area (40.34 percent) were between 31 and 40 years of age with the mean age as 40. This means that the farmers were in their active and energetic ages to withstand the rigors of farming activities. This finding is in line with those of Lawal (2015) and Tondo and Iheanacho (2015) who in their various studies reported that majority of rice farmers' fall within their youthful age.

Gender Status of the Rice Farmers
The result in Table 2 shows that majority of the participants (97.27 percent) were male while only 2.73 percent were females. On the other hand, 94.05 percent of the non-participants were male while 5.95 percent were female. This implies that there were more number of male involved in rice production in the study area than female who were more involved in processing and marketing activities. Adesiji, Komolafe, Kayode and Paul, (2016) and Folayan (2013) reported in their various studies that majority of respondents were male, which agrees with the pooled result of gender in Table 2 which indicated that 95.25 percent of the respondents were male.

Household Size of the Rice Farmers
The result of household size distribution of rice farmers in Table 2 reveals that more than half of participating farmers (60.91 percent) had household size of between 6 and 10 members with the mean household size as 8. The non-participants with the same household size range constituted (54.05 percent) with the mean household size of 9 persons. This means that the more than half of the participants had moderate household size compared to non-participants. The implication of the finding is that non-participants with larger household size have to cater for more members hence the need to cultivate more than the IFAD-VCDP recommended one-hectare intervention.

The pooled result reveals that majority of rice farmers in the study area (56.61 percent) had household size of between 6 and 10 members with the mean household size of 8. This result agrees with those of Lawal (2015) and Omorogbee and Onemolease (2008) who both reported that majority of the respondents in their individual studies had manageable household size but is contrary to that of Adagba (2014) who reported that the large household size makes the respondents in the study area to rely or depend on readily available and cheap family labour than hired labour.

Marital Status of the Rice Farmers
Marital status result in Table 2 shows that (3.64 percent) of the participants and (2.16 percent) of the non-participants were single. This shows that IFAD-VCDP accommodates participants with varying marital statuses i.e. single, married and others. Also, those who are single are more likely to take the risk of participating in the programme due to fewer family responsibilities. On the other hand, about 95.25 percent of the pooled respondents were married. This result is in line with the findings of Folayan (2013) and Omorogbee and Onemolease (2008) who both reported in their studies that majority of FADAMA project participants were married. This implies that they are committed to increase their income to enable them meet the family needs. Also they have access to family labour which is cheaper than hired labour.

Educational Status of the Rice Farmers

The result of educational status in Table 2 shows that there is higher illiteracy rate among the non-participants (10.81 percent) compared with 8.18 percent of the participants. The implication is that non-participants tend to be more risk-averse hence will be less likely to adopt innovations such as the IFAD-VCDP Project. On the other hand, majority of the pooled respondents (33.90 percent) reported that they had secondary education while about 26.10 percent revealed that they had primary education. This finding is in agreement with those of Folayan (2013) and Danjuma, Oruonye and Ahmed (2016) who reported that majority of the farmers sampled in their studies attained educational level of primary school and above; but is in disagreement with that of Adagba (2014) who concluded that majority of the respondents in the studied area had no formal education.

Effect of IFAD-VCDP on poverty status of the participants and non-participants

Table 3: Poverty status of participating and non-participants

	Participants	Non- Participants	Pool
Poverty Line (₦)	455,546.36	351,802.88	398,913.90
Frequency of "Poor"	17	42	76
Frequency of "Non-Poor"	93	143	219
Headcount Index (%)	15.45	22.70	25.76
Poverty Gap Index (%)	8.69	25.02	24.65
Severity Index (%)	1.53	8.71	9.18

Source: Computed from field survey, 2018

Results of poverty status of participating, non-participating and pool rice farmers presented in Table 3 shows the average income of N398,913.90k, N 351,802.88 and N455,546.36k for all respondents, non-participants and the participating farmers respectively. This implies that IFAD-VCDP had a positive impact on the income of participants. Further analysis shows that the income of 25.76 percent of all rice farmers in the study area was below N398,913.90k and 22.70 percent of non-participating farmers was below N351,802.00 while only 15.45 percent of participants reported that their income was below N455,546.36k. In other words, 25.76 percent and 22.70 percent of pooled and non-participants of IFAD-VCDP in the study area was "poor" while only 15.45 percent of the participating farmers were "poor". Furthermore, the poverty gap or the extent to which a population fall below the poverty line was 8.69, 25.02 and 24.65 percent for participants, non-participants and pool rice farmers in the study area respectively. This means that the "poor" among the participants were closer to the poverty line than the "poor" among the pool and non-participating farmers. This can be seen from the severity index in which only 1.53 percent of the participating farmers were suffering from severe poverty as compared to 8.71 and 9.18 percent of pooled and non-participating rice farmers. In whole, the result shows that IFAD-VCDP had a positive impact in alleviating poverty among the participating rice farmers in the study area. This is in conformity with the findings of Girei, Dire, Iliya, and Salihu (2013), Osondu, Ijioma, Udah and Emerole (2015), Folorunso, Gama, Mailumo and Okeke-Agulu (2017) and Moses (2017) who in their various studies reported that poverty incidence, poverty depth and poverty gap of the participants were less than that of the non-participants in their studied areas.

Conclusion

The study found out that IFAD-VCDP contributed positively in reducing poverty among the participants in the study area. This is evident from a higher poverty line of the participants compared to the non-participants and pooled farmers in the study area. Also the participants had lower poverty gap and severity index.

Recommendation

It was therefore recommended that Government at all levels should not default in payment of counterpart contribution so as to ensure sustainability of the programme.

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