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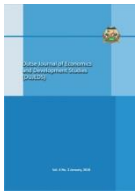

AN ASSESSMENT OF THE IMPACT OF ANIMAL TRACTION SCHEME ON POVERTY REDUCTION AMONG BENEFICIARIES IN KANO STATE, NIGERIA

ABDULLAHI M. Adamu — **Department of Economics, Bayero University, Kano-Nigeria**

BELLO Zakari Gwarzo — **Directorate of Academic Planning, Yusuf Maitama Sule University, Kano-Nigeria**

Abstract
The study empirically assesses the impacts of government development project on the economic empowerment of farmers called the Kwankwaso Animal Traction Scheme and its implications on poverty reduction in Kano state. The need to assess the impact of the project arises due to the perception that previous interventions in the area have little impact on farmers' productivity in the state due to politics and mis-utilization. A sample of 337 beneficiary farmers was used in the analysis. Stratified and simple random sampling method was used to draw the sample of the study from the total population of 1700 farmers who benefitted from the programme. The project is evaluated using Ordered Probit regression model with rate of change in productivity of the beneficiaries treated as dependent variable while age, farm size, farming experience, farm location and access to market were the independent variables. The overall outcome of the study shows that the programme has positively impacted on the productivity of the beneficiaries through a significant increase in the size of area cultivation thereby positively reducing poverty among farmers in the state. A t-test of significance conducted indicates a statistically significant difference in farmers' productivity after the empowerment. The study recommends among other things that the government should ensure strict and effective monitoring of the beneficiaries of interventions to avoid diversion.

Keywords: Assessment, Kwankwaso, Animal Traction Scheme, Poverty Reduction
JEL Classifications:

Introduction

Poverty alleviation has become the focal point of global development agenda nowadays. Also, it is the foremost developmental objective of most of the developing countries. Poverty reduction is the core development agenda of United Nations Organization; this could be a reason why it appears as the first item of the Millennium Development Goals (MDGs) and the recent Sustainable Development Goals (SDGs). Poverty alongside with climate change and international security are the key challenges of 21st Century (Mehta, 2008). It has been noted that since 1950s there has been a rising trends of poverty among developing countries and since that period, a wide range of approaches were suggested to address the issue (Zakari, Shehu and Aliero, 2012). The current approach to poverty at international level is the Sustainable Development Goals (2015-2030) which comes after the expiration of Millennium Development Goals (MDGs) which centered on halving poverty and extreme hunger from 2000 to 2015. Several social, environmental and economic problems are confronting Nigeria today. Kano State being a state in Nigeria is faced with insecurity, poor health care services, high illiteracy rate, unemployment, poverty among other problems. The poverty profile of Kano state has worsened over the years. Kano is the 15th poorest state in the federation with a poverty index of 61.9%, above the national average of 54% (NBS, 2010). This implies that nearly 7.5 million people in the state live below the poverty line. More than 80% of the people are dependent either on subsistence agriculture or the urban informal sector for livelihood. Access to public services, water supply, education and health are severely constrained (Sagagi, 2010).

It is on this bedrock that the Federal government, Kano State and Non-Governmental organizations and individuals have over the years brought out poverty alleviation programmes to reduce the scourge in the society to the lowest level. Various researches have been conducted in order to investigate the impacts of state empowerment programmes and interventions in reducing poverty both at the state and federal levels as well as the international level as it will be discussed in the literature review. In Kano state as it is the scenario in all the states of the federation, the rate of poverty is worse in the rural areas of the state. The government introduced the Animal Traction Scheme to directly impact on the rural populace who are predominantly farmers. This motivated the researcher to conduct this study in order to assess the contributions of the scheme in reducing poverty among the rural farmers in Kano state.

This paper investigated the impacts of Animal Traction Scheme on poverty reduction among the beneficiary farmers. The few studies the researcher was able to come across which investigated the impacts of interventions in reducing poverty among beneficiary farmers failed to examine the influence of irrigation source or water lodge on the overall productivity/output of the farmer. This study examined how availability of water lodge or proximity to irrigation source can influence the productivity of the beneficiary farmer and his income level. This paper will be of great value and importance in providing ideas and knowledge to the stakeholders in poverty reduction, especially the Kano state government, in conducting another economic empowerment/intervention programme.

Literature Review

Yunana, Abubakar and Francis (2013) conducted a research on the impacts of the Fadama 3 project on the income and wealth of the beneficiary farmers in FCT Abuja, Nigeria. The researchers used age, education level, crops cultivated, method of land acquisition, source of capital, source of labour, method of land cultivation, crops varieties planted, source of planting materials, access to implement, availability of inputs and the value of productive assets as explanatory variables while income was used as dependent variable. The findings of the study shows that the value of productive assets of Fadama beneficiaries increases from N81,240.97 to N84,957.75 after Fadama 3. Conversely, there was a decrease in net farm income of the beneficiaries from N198, 261.5 to N170,180.4 during the fadama 3 project. The study concluded that the decrease in income despite the acquisition of productive assets could be due to limitations encountered by the farmers.

Mohammed and Abdullahi (2014) conducted a research to assess the effects of a government run participatory development project on the economic empowerment of women called kwankwaso women empowerment scheme and its implications on poverty alleviation in Kano state using a Classical Linear Regression (CLR) model with rate of change in income of the beneficiaries treated as dependent variable. The outcome of the study confirmed that the project plays a positive role in poverty reduction in the state.

Emmanuel and Muhammed (2009) conducted a research to investigate the role of Youth Empowerment Scheme of Niger state on poverty alleviation through skills acquisition. A survey design was adopted for the study. The study reveals that the scheme was successful in empowering its beneficiaries through vocational skills acquisition, hence contributing to a change in their socio-economic status.

Ogbonna, Onyenweaku and Nwaru (2012) investigated the determinants of rural poverty among yam farmers in Southeastern Nigeria. The sample size was 300 yam farmers of the region; regression analysis was employed in the study. The dependent variable was poverty line measured in Nigeria (purchasing power parity) , while the explanatory variables were education of the household which was measured as years of schooling, member of farmers group, experience in yam production, livestock asset, farm size, participation in agricultural workshop, household dependency ratio and access to microcredit. The main finding of the research was education of farmers, year of farming experience and access to microcredit were the major determinants of rural poverty and affected poverty negatively. However, participation in farmer group, household dependency and participation in agricultural workshop were insignificant.

Ogwumike and Akinnibosun (2013) studied the determinants of poverty among farming household in six geopolitical zones of Nigeria with a sample size of 19,158 households. Logit regression model was employed in the study in which poverty status of the household was used as dependent variable. The explanatory variables were age of household, household size, income from farming activities, number of farms, land-holdings by household head and location of residence. The result of the study revealed that the major determinant of poverty among the farming household is farmers' income; it has a negative effect to poverty. The remaining explanatory variables were not significant.

Muhammad (2012) carried out a review of Nigeria's Poverty Reduction Programmes and Strategies and found that the policies were not implemented as planned. He found that poverty reduction programmes in Nigeria were ineffective due to the following reasons: poor policy formulation and coordination, the stakeholders (poor) are not involved in the formulation of the programmes, inadequate implementation strategies, policy discontinuity, duplication of functions among agencies, absence of policy framework, lack of supervision and corruption especially in the public sector. The poverty reduction institutions in Nigeria have become an avenue for political compensation rather than avenue for equitable distribution of income.

Datt and Ravallion (1998) found that output per unit of land significantly affects the poverty gap in India. They examined the impact of farm productivity and showed that higher yield significantly reduces poverty via rising average living standards. They found that even small impact of agricultural growth on food prices can have larger effects on reducing poverty. Janvry and Sadoulet (2009) used agricultural land and labour productivity to study their impacts on reducing rural poverty. They found that growth in yield and in agricultural labour productivity are highly associated with poverty reduction, but the extent to which they affect poverty sharply varies across regions. Their findings indicate that poverty reducing impact of agricultural growth is higher in poor countries than in rich countries. They also found that agricultural productivity can indirectly affect poverty through strong growth linkage effect on other sectors of the economy.

A similar study was carried out by Nyamboga et al (2014) to evaluate Kenyan Government policy initiatives on poverty reduction. The major finding of the study is that poverty reduction strategies of the Kenyan governments have failed to fight poverty in the country, the level of poverty continues to escalate in the country despite the establishment of the poverty reduction strategies. The reasons for the failure are weak coordination of the institutions, duplication of the efforts, lack of clear policy direction and corruption among others.

A study carried out by Hatta and Ali (2013) evaluated poverty reduction policies in Malaysia using secondary data. The study finds that poverty reduction strategies were successful in reducing poverty in Malaysia due to two reasons: first, the social policies have had an orderly and incremental owing to a supportive environment; secondly, there is a successive strong government and public sector commitment to improve the welfare of the citizens.

Methodology

This study was conducted in Kano State located in North-Western Nigeria and is the most populous state in the Nigerian federation. Created on May 27, 1967 from part of the Northern Region, Kano state borders Katsina State to the north-west, Jigawa State to the north-east, and Bauchi and Kaduna states to the south.Kano first became known to the outside world after the visit of Leo-Africans' in A.D. 1513. The State has 44 Local Governments. Kano State is the second most industrialized state with an estimate of over 300 large and medium industrial establishment spread across Sharada, Challawa and Bompai Industrial Estates. Kano State is the most populous state in the country with a population of over 9 million people (National Population Commission, 2006). For the purpose of this study, the state is divided into three as in accordance to its senatorial zones.

Population of the Study

The population of this study consists of one thousand seven hundreds (1,700) Youths who are the total number of the beneficiaries of Animal Traction Scheme in Kano state.

Sample Size and Sampling Techniques

Stratified and simple random sampling method was used to draw the sample of the study. Stratified sampling system was used because it improves the precision of the sample by reducing sampling error. Also, the varieties of farm products produced by the beneficiaries vary from one area to the other. Hence the need to stratify the farmers according to zones. For the purpose of this study, the state was stratified into three categories based on its senatorial districts, that is Kano north (13 local government areas), Kano central (15 local government areas, out of which only 9 were considered in the program) and Kano south (16 local government areas). This means that Kano has 44 local government areas but only 38 local government areas were selected for the programme, excluding the 6 local governments within the metropolitan. Due to research limitations, 12 local governments were selected using simple random sampling and simple division of **"over 3"** in each of the senatorial districts. In Kano North, out of thirteen (13) local governments, four (4) were chosen (Kabo, RiminGado, Tofa, and Gwarzo). In Kano Central, three (3) local governments (Kura, Gezawa and Ungogo) werechosen out of nine(9). In Kano South, five (5) local governments(Kiru, Karaye, Wudil, Gaya and Roggo) were chosen.

A sample size of 360 respondents was used to carry out the study. The sample was derived using the method provided by Krejcie and Morgan (1970).

$$S = X^2NP\ (1 - P) \div d^2\ (N - 1) + X^2P\ (1 - P) \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ (1)$$

S= required sample size

d= the degree of accuracy expressed as a proportion (0.05)

X^2= the table value of chi-square for 1 degree of freedom at the desired confidence level (3.841)

Thirty (30) respondents were selected from the total number of the beneficiaries from each of the selected local governments.

N= the population size

P= the population proportion (assumed to be 0.50)

Model Specification

The model was used to identify the influence of the cumulative beneficiary resources comprising of five dimensions (age, farm size, farming experience, location and proximity to market) on productivity/output as a proxy to poverty reduction among the beneficiaries of Animal Traction Scheme.

The model is expressed as:

$$Y_i = X_i\beta + \mu_i$$
$$Y = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \beta_5X_5 + \mu_i$$

The above can be expressed as:

$$PA = \beta_0 + \beta_1AGE + \beta_2FSZ + \beta_3FEX + \beta_4FLOC + \beta_5MKTP + \mu_i$$

Where:

PA is an ordered dependent variable and it represents the output level of the farmers after the intervention.

PA =1 if a farmer achieved low output level (i.e if a farmer produced output below average).

PA = 2 if a farmer produced moderate output level (i.e if a farmer produced output above the average with 20 bags).

PA = 3 if a farmer achieved high output level (i.e if a farmer produced output above the average with 21 to 40 bags).

PA = 4 if a farmer achieved very high output level (i.e if a farmer produced output above the average with above 40 bags).

PA is beneficiary's level of output/productivity which was used as proxy of poverty reduction.

X_i represents the set of explanatory variables. While some are continuous, others are categorical.

AGE=X_1……. Age of the respondent which was be measured on an interval scale since most people do not like to reveal their real age.

FSZ=X_2…… Size of farm land which is measured in term of acres of the farm cultivated by the respondent. The size of farm in most cases is expected to determine the output level. The researcher employed an interval scale since most farmers do not precisely know the size of their farmlands.

FEX=X_3…… Level of beneficiary farmer's experience. This refers to the number of years spent by the respondent in farming profession. It is assumed that the more time or years expended, the more the experience gained by a farmer. Interval scale was used to avoid exaggeration by respondent.

FLOC=X_4…..…. Location of farmland. That is if the farm is located near source of irrigation/water lodge or otherwise.

MKTP=X_6…… Marketing Problems. Availability of market in case of increased output level.

$\beta_0$is the intercept;

For the ordered Probit model, μ_i is standard and normally distributed.

Result and Discussion

Three hundred and sixty (360) questionnaires were administered out of which three hundred and fifty four (354) were returned. Out of the 354 returned, only 337 were used because the remaining seventeen 17 were not properly completed and almost 90% of the questions were not answered. However, before presenting the estimated models, descriptive analysis of the respondents as well as their responses were presented.

Table 1: Farmers' Productivity Level

S/N	DEPENDENT VARIABLE	FREQUENCY	PERCENTAGE
1	**Farmers' Productivity Level After Intervention:**		
	Low	147	43.62
	Moderate	92	27.30
	High	55	16.32
	Very High	43	12.76
	Total	**337**	**100**

Source: Author's computation, 2017.

Table 2: Farmers' Productivity Level before Intervention

	FREQUENCY	PERCENTAGE
Low	239	70.92
Moderate	74	21.96
High	13	3.86
Very High	11	3.26
Total	**337**	**100**

Source: Author's computation, 2017**.**

Table 3: Size of Land Cultivated before the Intervention

		FREQUENCY	PERCENTAGE
(a)	< 1 acre	164	48.66
(b)	1-2 acres	163	48.37
(c)	> 2 acres	10	2.97
Total		**337**	**100**

Source: Author's computation, 2017.

Table 4: Farmers' Socio Economic Characteristics

S/N	VARIABLES		FREQUENCY	PERCENTAGE
1	**Age of Farmers:**			
	(a)	18-30 years	137	40.56
	(b)	31-43 years	195	57.86
	(c)	43-56 years	5	1.48
	(d)	> 56 years	0	0
	Total		**337**	**100**
2	**Size of Farmland:**			
	(a)	< 1 acre	26	7.72
	(b)	1-2 acres	258	76.56
	(c)	> 2 acres	53	15.73
	Total		**337**	**100**
3	**Farming Experience:**			
	(a)	1-5 years	14	4.15
	(b)	6-10 years	90	26.71
	(c)	>10 years	233	69.14
	Total		**337**	**100**
4	**Location of Farmland:**			
	(a)	Near irrigation/water lodge	69	20.47
	(b)	Otherwise	268	79.53
	Total		**337**	**100**
	Marketing Problems:			
	(a)	Yes	80	23.74
	(b)	No	257	76.26
	Total		**337**	**100**

Source: Authors' computation, 2017.

Table 5: Farmers' Average Output (After Intervention)

	Mean Value (bags)	Minimum Value (bags)	Maximum Value (bags)
Farmers' Average Output:	59.5	19	149.5

Source: Author's computation, 2017.

Table 6: Farmers' Average Output (Before Intervention)

	Mean Value (bags)	Minimum Value (bags)	Maximum Value (bags)
Farmers' Average Output:	40.7	15.5	127

Source: Authors' computation, 2017**.**

Data Summary

In table 1, we can see the farmers' responses with regard to their output level (productivity) after the intervention were tabulated and labeled as low, moderate, high and very high. Also, the farmers' responses to the impact of the intervention on their output were extracted. A total of 147 (43.62%) farmers produced below the average output level of 50 bags per farmer. 92 (27.30%) of the farmers produced moderate level of output (i.e from 50 to 69.99). Those with high level of output comprise of 55(16.32%) famers with 70 to 89.99 bags of output. Those that account for the very high output level comprises of 43(12.76%) farmers whose outputs are 90 bags and above.

To showcase the improvement in farmers output brought by the intervention, table 4.2 shows the farmers responses with regard to their outputs before the intervention. 239(70.92%) farmers produced below the average of 50 bags as against 147 after the intervention. 74(21.96%) farmers produced moderate output, 13(3.86) farmers produced high output level while only 11(3.26%) farmers produced a very high level of output with 127 bags as the highest output recorded among the sampled farmers.

The farmers' socio-economic characteristics were described in table 4 Starting with the farmers' age as the first variable in the table, the group that accounted for the larger portion of the respondents is that of 31-43 years where 195 (57.86%) respondents out of the sample farmers' fall within this group. This is followed by 18-30 year group which accounted for 137(40.65%) respondents out of the sampled farmers. The least is the 44-56 year group which has only 5 (1.48%) respondents out of the sampled farmers. None of the respondents was above 56 years of age. The proponents of the Animal Traction Scheme introduced it as youth empowerment scheme hence, only farmers within the youthful age group are expected to benefit from the programme. Due to the age of the people involved in the farming business in the state, the government considered those within the age bracket of 18-40 as eligible for the intervention. The description shows that the age guideline for the selection of the beneficiaries of the programme was partially followed as 332 (98.52%) out of the sampled farmers fall within the age bracket of 18-43, only 5 (1.48%) of the sampled farmers were above 43 years.

In terms of farm size, the number of farmers that cultivate less than one acre after the intervention comprises of 26(7.72%). 258(76.56%) of the sampled farmers cultivate 1-2 acres of farmland, while 53(15.73%) cultivate land area above 2 acres. To showcase the increase in area of cultivation brought about by the intervention, table 4.4 indicates the size of land cultivated by each of the sampled farmers before the intervention. The table shows that 164(48.66%) of the sampled farmers cultivate less than one acre, while 163(48.37%) of the sampled farmers cultivate 1-2 acres of farmland. Only 10(2.97%) out of the sampled farmers cultivate above 2 acres before the intervention. In terms of location of farmlands, 69(20.47%) of the sampled farmers farmlands are located near a source of irrigation or water lodge while 268(79.53%) of the sampled farmers farmland is located elsewhere.

In terms of marketing, 80(23.74%) of the sampled farmers maintained that they faced various challenges in marketing their products, 257(76.26%) of the respondents maintained that they did not face any challenge while marketing their products. It is important to know that majority of the farmers that complained of marketing problems are dry season farmers.

Models Estimation

In the oprobit model, the dependent variable (farmers' productivity level after intervention) was considered to be ordered starting with low and ending with very high response.

Table 7: Estimated Ordered Models: The Determinants of Farmers' Productivity

S/N	VARIABLES	MODEL	Marginal effects
		Oprobit	**Oprobit**
1	Age	.0287725**	-0.00738
		(.0130113)	
2	Farm Size	1.793812*	-0.4604
		(.1627359)	
3	Farming Experience	.0841519***	-0.0216
		(.0494087)	
4	Farm Location	-.3917072	0.10054
		(.2843077)	
5	Marketing problems	-.9315573*	0.2391
		(.277938)	

Source:

1. *Standard errors in parentheses.*
2. ** Highly significant at 99%; ** fairly significant at 95%; *** slightly significant at 90%.*

Oprobit regression:

Number of observation = 337
LR chi^2 = 297.19
Prob> chi^2 = 0.0000
Log likelihood = -281.03866

Pseudo R^2 = 0.3459

Threshold parameters:

cut1 1.192333
cut2 2.395234
cut3 3.81666

Discussion of Findings

As stated earlier in this chapter, the explained variable (Farmers' productivity) was ordered such that the above Oprobit (table 7) was estimated to empirically explain not just the relationship between the dependent and the explanatory variables but also the statistical significance of the coefficients of these explanatory variables. There is no constant term in the model because the effects of the constant are absorbed in the threshold parameters. Age turned out to be positively related with the farmers' productivity. As farmer grows older, he is likely to attain increased output. The possibility of increasing productivity, thus, is likely to be higher for the relatively older farmers and lower for younger farmers. Age is also statistically significant as it has less than 0.05 probability values in the model.

The coefficient of the variable farm size also turned out to be positive and highly significant at 99% in the model. The marginal effect indicates that there are 46% possibilities for a farmer to attain low productivity as the farm size increases. The reason for the high value of the marginal effects may be due to the traditional nature of the tillage system and the overall cultivation process. An increase in the size of the farmland will definitely not produce a proportional increase in output as the methods used in the cultivation are merely traditional and crude.

The coefficient of the variable farming experience is positive in the model. On the other hand, the coefficient of the variable farming experience is fairly significant in the oprobit model with a P-value of (0.08). As stated earlier, the system of cultivation in the state is mostly traditional and thus requires no longer time to obtain experience. Some of the indicators of a farmer's ability or capacity to maximize productivity is the proximity or nearness of his farmland to irrigation channel or water lodge. These are likely to be positively related to his probability of attaining high productivity level as it will provide him with the opportunity to cultivate his farmland even in the dry season. However, the coefficient of farm location turned out to be negative and insignificant in the model. That is to say, even though some of the sampled farmers' farmland are located near the irrigation channels, the farmers do not always consider using the farmland for irrigation. This is mainly due to the low profit and unfavorable prices attached to most of the items produced during such period. Also, the farmers confessed that the amount of capital needed for irrigation farming is not obtainable to the low income farmers. The perishable nature of most of the items produced also discouraged the farmer from being engaged in the irrigation farming as they cannot be stored when the prices are low.

Expectedly, problems attached to the marketing processes of agricultural output affect the productivity of the farmers negatively. The probability of a farmer to maximize his output even with the intervention at his disposal will be very low if the farmer cannot find market for his product. This is the reason why farmers with access to irrigation sources decide not to cultivate their lands as the items produced are usually faced with lower prices.

On the general fitness of the models, it could be stated that the model is well fitted with the R2 having high value of approximately 0.35 in the oprobit model. Also, the cut points or threshold parameters in the model is significantly different from one another showing that the ordered productivity levels of the farmers are significantly distinct in both models.

Conclusion and Recommendations

From the forgoing discussion, it is readily perceived that despite the fact that farmers in Kano state face so many problems in their agricultural business, the programme has made a significant impact on their productivity and an increase in size of area cultivation is noticed. The inability of the state government to further encourage the establishment of agricultural raw materials processing industries will continue to pose a threat to the development of agricultural sector in particular and the economy of the state in general. Based on the findings of this study, the following recommendations are made:

1. It is highly recommended that the government should establish agricultural raw materials processing industry or provide a conducive atmosphere for investment that will encourage private investors to establish industries in the state. This will really boost agricultural output and provide more employment to the many people in the state. Most of the farmers with access to irrigation channels do not engage in the irrigation farming because of the fear that they may not find a favorable market for their outputs. Establishment of such industries will surely help in clearing the excess supply of such products in the market, thereby stabilizing their prices.
2. The government should also encourage the farmers to form co-operative groups under which the government can provide tractors to be used by such groups as some of the farmers cultivate farmlands that cannot be tilled to its fullest potential by using animals and human labour. The provision of more mechanized farming equipment will further reduce the size of uncultivated land in the state.

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