



Full Text Article

Impact of Community-Based Agriculture and Rural Development Project on Income of Farmers in Kwara State, Nigeria

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Abstract

Community-based agriculture and rural development (CBARD) projects have made huge efforts to achieve their objectives to improve the livelihoods and living conditions of the rural poor by supporting sustainable social, agricultural and economic development interventions. The study investigated the impact of CBARD project on the income of goat farmers in Kwara State, Nigeria. A multistage sampling procedure was employed to select a sample size of 185 respondents. Data was collected from the respondents through a well-structured instrument. Descriptive statistics, Chow test, rank-based quotient, and t-test were employed to analyse the data. The mean age of beneficiaries and non-beneficiaries of the project were 47 and 33 respectively. A significant proportion (70.0%) of the beneficiaries were women whose families had twelve dependents on average. The majority (85.0%) of non-beneficiaries were also women with an average household size of seven members. Education levels varied among the respondents, with higher education positively influencing technology adoption. Most of the beneficiaries received information about the project through extension agents. The result of the Chow test showed that the community-based agriculture and rural development project had a greater impact on the income of beneficiaries than that of non-beneficiaries. In terms of asset ownership, beneficiaries owned home appliances, communication devices, and vehicles several years after the end of the project. The results of the housing types revealed that among the beneficiaries, 40.4% lived in terracotta houses with zinc roofs, while 33.2% resided in concrete block houses with zinc roofs. In contrast, 34.9% of non-beneficiaries lived in terracotta houses with zinc roofs, and 17.4% in concrete block houses with zinc roofs. In terms of benefits, farmers reported improvements in capacity building (3.10) and small ruminant productivity (3.10). The key challenges included disease outbreaks (93.3%), high veterinary costs (69.1%), lack of subsidies (90.8%), inadequate doorstep technical support (75.8%), and exploitation by intermediaries (96.0%). Beneficiaries of the community project had significantly higher incomes compared to non-beneficiaries ($p < 0.05$). The study concludes that the CBARD project had a significant impact on the income of beneficiaries compared to non-beneficiaries.

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Introduction

Agriculture and rural development are essential to the structural transformation and economic development of Nigeria (Omeje & Ogbu, 2015). Hitherto, agriculture is one of the most important sectors of the Nigerian economy. This sector plays an important role in job creation and contributes to gross domestic product (GDP) and export earnings (NBS, 2023). In 2021, the agricultural sector contributed approximately 24% to Nigeria's gross domestic product, with about 47.3% of the rural population primarily earning their livelihood through small-scale agriculture and related rural activities (World Bank Group, 2021). Over 70% of Nigerians work in agriculture, mainly for subsistence purposes. Smallholder farmers account for 90% of national food production and 87% of rural families in Nigeria engage in livestock farming. Likewise, 56% of rural households in Nigeria owned or raised livestock (Statista, 2022). Despite its contribution to the economy, the Nigerian agricultural sector faces numerous challenges that impact its productivity. These included; low technology, high production costs, poor distribution of inputs, limited financing, high post-harvest losses and difficult market access. These challenges have reduced agricultural productivity, impacted the sector's contribution to the country's GDP, and increased food imports due to population growth and accompanying declining food supplies. For example, the International Fund for Agricultural Development (IFAD, 2021) reported that Nigeria's cumulative agricultural imports between 2016 and 2019 were \$3.35 trillion, four times the agricultural exports of \$803 billion in the same period. Limited availability of inputs, equipment, extension services and markets, as well as climate change and price volatility, keep the country's agricultural productivity low.

According to Dross (2016), one way to improve agricultural production and general living conditions in rural areas is to introduce improved agricultural technologies to farmers. Idrisa (2019) pointed out that the adoption of improved technologies is an important way to increase the productivity of smallholder farmers in Africa, thereby supporting economic growth and improving the well-being of millions of poor families. In this context, the Community-Based Agriculture and Rural Development (CBARD) Project was launched to create a policy, institutional and financial framework for demand-driven development. It carries out activities related to agriculture and rural infrastructure and capacity development (IFAD, 2015). According to the World Bank Group (2021), the development objective of the Community-Based Agriculture and Rural Development project was to improve the livelihoods of rural communities in terms of sustainable income, improve access to basic socio-economic conditions and improve natural resource management. The project should achieve this through capacity building and investment in economic, social and environmental sub-projects in these communities. The ADB-CBARD project was implemented in five states namely Adamawa, Bauchi, Gombe, Kaduna and Kwara (KWADP, 2023).

Goat farming is an integral part of Nigeria's livestock sector, which accounts for a significant portion of the country's agricultural activities (Okpeku et al., 2016). Goats are highly adaptable and resilient and provide valuable products such as meat, milk, fibre, and skins. Goat farming is a significant source of income for smallholder farmers in Nigeria (Esuroso et al., 2020). Goat farming in Nigeria presents significant opportunities for enhancing food security, poverty reduction, and rural development. With a large population and diverse agroecological zones, Nigeria has the potential to mobilize these resources to improve food security, reduce poverty and promote sustainable rural development (Olorunju & Mapiye, 2020). Nigeria possesses a rich diversity of indigenous goat breeds. Some notable indigenous breeds include the West African Dwarf (WAD)- *Capra hircus*; Red Sokoto- *Chevre rousse de Maradi*; Sahel- *Capra aegagrus hircus*; and Kano Brown- *Capra hircus* Linnaeus. Each of the breeds adapted to specific agroecological zones and produc-

tion systems in Nigeria. These breeds are valued for their adaptability, disease resistance, and ability to thrive in resource-limited environments (Adeoye, 2020). The objectives of CBARD project on livestock production include to: empower farmers and demonstrating modern livestock management; improving the productivity of their stock using improved stock to upgrade the local stock; wealth creation, employment, and poverty reduction; and increasingly effectively managing their development and prevention of livestock diseases through vaccination. The Nigerian government and the International Fund for Agricultural Development (IFAD) have over the years spent large sums of money to finance agricultural development through the adoption of CBARD project in the areas covered by the program. However, poverty appears to persist in most rural households and there is clear evidence of gender marginalization in some programs (ADF, 2015).

Community-based development is a form of development within the community through the maximum participation of community members in the design and implementation of the project that brings about improvement (Michael, 2016). Usually, community-based development is small-scale, low-cost, and uses simple technologies. According to the International Fund for Agricultural Development (IFAD, 2007), community-based development projects help build capacity and strengthen institutions, providing services to rural poor people, assisting with necessary policy changes, developing local organizations to enhance their effective participation, and promoting initiatives to foster rapid private sector-led poverty reduction strategy and economic growth. Considering the pronounced poverty in the country especially in the rural areas in the northern states of Nigeria, the African Development Bank (AfDB) came up with CBARD project intervention for the country. The project was approved in 2003 and started in 2005 until 2015 with the Federal Ministry of Agriculture and Rural Development as the implementing agency. The project, located in northern Nigeria, covered Adamawa, Bauchi, Gombe, Kaduna and Kwara states. Major components of the project are capacity building, production development, community development as well as project management and coordination (FMARD, 2006).

The existing traditional goat farming is valued for its simplicity in rearing the local goats by using crude methods of management practices which might be easier for women to handle. But the objectives of the CBARD project on livestock production are to: empower farmers and demonstrate modern livestock management; improve the productivity of their stock using improved stock to upgrade the local stock; wealth creation, employment, and poverty reduction; increasingly effectively manage their development and prevention of livestock diseases through vaccination.

Empirical studies

Various impact analysis studies and other related impact assessment studies have been conducted to prove the effectiveness of the CBARD project. The research of Apata and Saliu (2016) on "The Impact assesment of the Fadama Project on Agricultural Development in Kwara State, Nigeria" revealed that during the implementation of the Fadama project on productive assets including livestock, the income of the beneficiary farmers increased much more than before the project and even more of the income of the non-beneficiary farmers. The study found that Fadama respondents have higher annual incomes than their non-Fadama counterparts. The study recommended a significant difference between the productivity of fadama participants and non-fadama participants. Hence, Fadama farming should be extended to all farmers to increase their productivity. Funds and other resources allocated to Fadama activities must be properly monitored to ensure that they are not used for other purposes. The policy recommendation is that the Fadama project should not be stopped but should continue to impact farmers. Another study conducted by Adeyemo and Kehinde (2021) on Community-driven development:

the case of Fadama II cooperatives in alleviating poverty in a developing country showed that the probit estimate revealed that Fadama II cooperatives had a significant effect on alleviating the poverty among the participants. Following the findings of the study, government and non-governmental organizations are encouraged to ensure that more farmers participate in Fadama II cooperatives. The results of the log-likelihood function and pseudo R² were -72.15 and 0.2197. The entire model was significant at 1% and this implies that the model was of best fit. The household size and net income accruing from Fadama II cooperative participation were found to influence the poverty status of the participants significantly. However, the coefficient of household size had a negative sign (-0.200), indicating that an increase in household members by a person decreases the probability of a farmer not being poor. On the other hand, an increase in the net farm income of farmers helps reduce their poverty status. Similarly, an impact study was conducted by Ebenehi et al., (2012) on the impact of the National Poverty Eradication Program (NAPEP) on Rural Livelihood in Kogi State, Nigeria. The study found that the level of income of participants increased from N77,523 (USD 50) before the intervention to N233,268 (USD 150) after the intervention as a result of participation in the programme. However, the mean level of living for the non-participants increased from N94,159 (USD 61) before the programme intervention to N113,873 (USD 73) after the intervention. The mean increase in income as well as the level of living of participants under the NAPEP improved the living standards of Nigerians in rural areas. The report noted that despite the problems encountered in previous poverty reduction programs in Nigeria, NAPEP continued to have a significant impact on Nigeria's economic development.

Furthermore, a study by Othman (2016) on the impact of community organizations on rural development in Kano State, Nigeria, found that community organizations played a key role in providing infrastructure such as water for domestic needs, building classrooms and other social facilities Services. However, the main obstacles to successful implementation were the lack of funding, policies, capacity building and training since a significant proportion of the farmers rely on the government and donor organizations for improved production technologies, inputs and loans. Furthermore, despite the existence of a community-based agriculture and rural development project in Kwara State for over a decade, it is not clear whether the contribution of this project had a significant impact on the income of the beneficiaries and non-beneficiaries in the study area or if there was a significant difference between their incomes. Hence, the study sought to investigate the impact of CBARD project on the income of farmers in Kwara State, Nigeria.

Materials and Methods

The Study Area

The study was conducted in selected local government areas of Kwara State during the year 2023 which was earmarked only for field research. The Niger River borders Kwara State from east to north and is often referred to as a savannah ecotone because it forms a transition zone between the forest and savanna regions of Nigeria. The state is located in the north-central part of the country, approximately 502.3 km from Abuja, the federal capital. The state is geographically bordered by Niger State to the north, Oyo, Osun and Ekiti to the south, and Kogi State to the east and lies between latitudes 80 and 100 north and longitudes 30 and 60 east. The state covers an area of approximately 36,825 square kilometres and has a population of 3,551,000 inhabitants in 2022 (National Bureau of Statistics, NBS, 2023). It has a population density of 106.2/km² as of 2022 with an annual population change of 2.6% while the population density varies between 20 and 120 inhabitants per km². There is an agricultural population of 500,000 farming families, supported by the provision of agricultural inputs and rural infrastructure such as rural access roads, water pipes, irrigation systems and processing equipment (KWADP, 2023). Eco-

nomically, Kwara State is heavily dependent on agriculture, particularly the cultivation of coffee, cotton, peanuts, cocoa, oil palms and kola nuts. Other key industries include goat, poultry, cattle and sheep farming. Kwara State has the 20th highest human development index in the country and has numerous universities (Global Data Lab, 2021).

The Kwara State Agricultural Development Project (ADP) comprises four (4) agricultural extension zones of different local government areas (LGAs) namely: Zone A comprising Baruten and Kaiama; Zone B includes Edu and Patigi; Zone C comprises Asa, Ilorin East, Ilorin South, Ilorin West and Moro while Zone D comprises Ifelodun, Offa, Oyun, Isin, Irepodun and Oke-Ero. The five (5) LGAs have participated in improving goat farming under the CBARD project in Kwara State. These include Edu from Zone B, Ilorin South from Zone C, Oke-Ero, Isin and Ifelodun from Zone D.

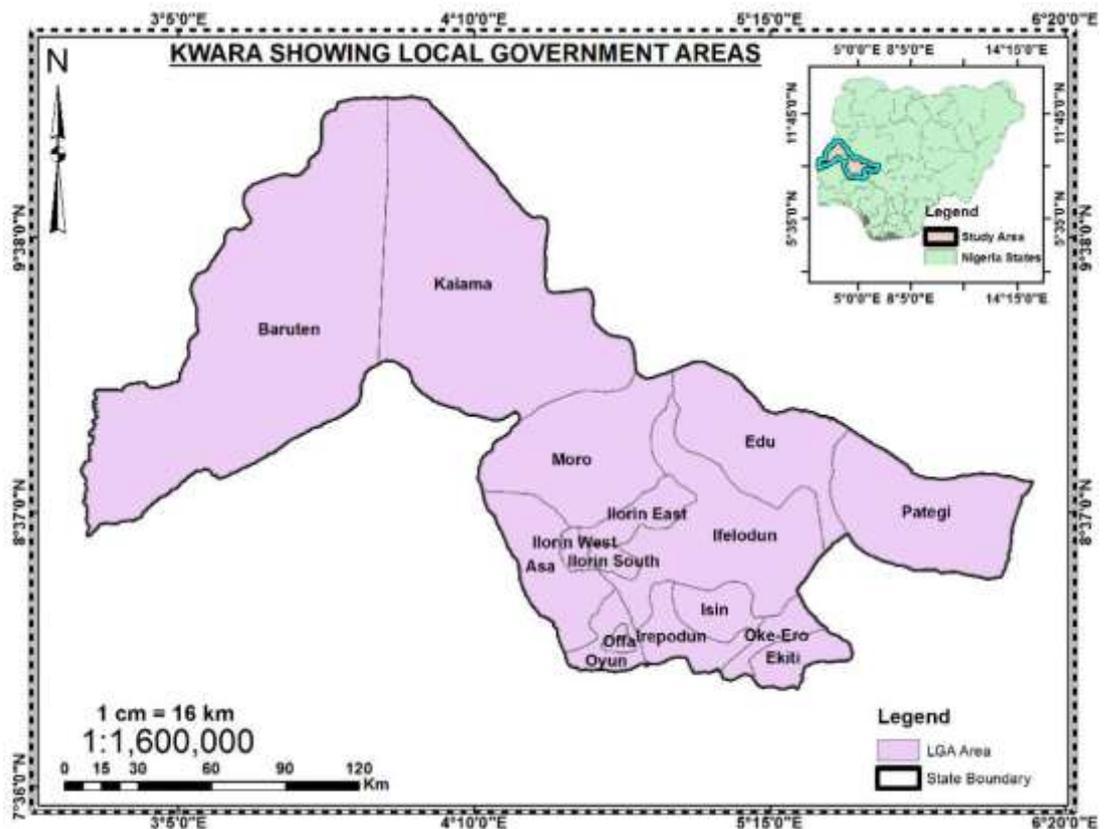


Fig. 1: Map of Kwara State showing the 16 Local Government Areas

Source: Field Survey, 2023

Study population

The study population includes all goat farmers who benefited from the CBARD project in Kwara State. The study also covers some selected goat farmers who did not benefit from the intervention.

Sampling method and sample size

A four-stage sampling technique was used to select respondents from the five participating Local Government Areas within the four ADP agricultural zones of the state. In the first stage, one LGA from each participating agricultural ADP zone was purposefully selected for CBARD project. These are Edu, Ilorin South and Ifelodun LGAs of Zones B, C and D, respectively. In the second stage, two rural communities were selected from each of the selected LGAs to participate in the project using the simple random sampling method. These communities are Shonga and Tsaragi of Edu LGA; Magaji Ajomu and Fufu

are from Ilorin South LGA while Omupo and Oro-Ago are from Ifelodun LGA. The third stage was to select 10% of the total population of beneficiary farmers proportionally as it is not possible for the researcher to take the total number of farmers involved in the study. Therefore, based on the sample size, 10% of the beneficiary farmers were selected. Sub-population was used to represent the entire population. The fourth stage was to select non-beneficiary farmers in the selected rural communities using the snowballing sampling technique. A total sample of 185 respondents was used for the study which include 99 beneficiaries and 86 non-beneficiaries.

Table 1: Sampling frame for the study

Stage 1	Stage 2	No. of	Stage 3	Stage 4
Purposive selection of one participating LGA from each ADP zones.	Simple random Selection of two (2) Beneficiary Villages	Beneficiaries	Proportionate selection of 10% from Beneficiaries (%)	Snow-Ball selection of Non-Beneficiaries (Snowballing)
Edu	Shonga	180	18	16
	Tsaragi	170	17	15
Ilorin South	Magaji Ajomu	140	14	10
	Fufu	180	18	15
Ifelodun	Omupo	170	17	16
	Oro-Ago	150	15	14
Total		990	(99	86)= 185

Source: Field Survey, 2023

Instrument for Data Collection

Data collection was done through the administration of a well-structured questionnaire with the aid of an interview schedule. Focus Group Discussion was also conducted for a few of the respondents to complement the process. The instrument consisted of four (4) sections, that is, sections A, B, C, and D. Section A consists of the socioeconomic characteristics of the goat farmers; Section B comprises sources of information on the CBARD project; Section C consists of the impact of the CBARD project on the income of the goat farmers; Section D comprises the impact of the CBARD project on the income of the goat farmers; and Section E consists of the constraints facing the goat farmers in the study area. The researchers sought the consents of the respondents on FGDs through the CBARD project's focal person who has been in the forefront of the project.

Extension experts were consulted to validate the contents of the instrument while Test-retest reliability method was used to test the consistency of the instrument in measuring the contents. The result of the Pearson Correlation Coefficient (r) was 0.85 which depicted that the instrument was reliable.

Data Analysis

Data were analyzed using descriptive and inferential statistical tools. The impact of the CBARD program on the income of beneficiaries and non-beneficiaries was assessed using the Chow test. Chow test statistics are often used in program evaluation to determine whether the program has an impact on different subgroups of the population (Doherty, 2007). It requires the sum of squares of the residuals of three regressions, one

for each sample group and one for the aggregate data. If the F-chow is greater than Table F, it means the program had an impact on the beneficiaries, otherwise it would have no impact. This can be expressed mathematically as follows.

Where;

RSSR = sum of squares of the residuals of a linear regression, assuming b_1 and b_2 are equal, b has dimension k , and there are n total observations.

SSR1 = sum of squares of linear regression residuals from sample 1.

SSR2 = sum of squares of linear regression residuals from sample 2.

The total number of observations is $n = n_1 + n_2$ and the number of parameters is k . The perceived limitations data were subjected to the rank-based quotient (RBQ) technique developed by Sabarathnam (2002). For this purpose, the degrees of agreement and disagreement were given as one and two, respectively. The frequency of ratings given by farmers for each of the 36 constraints was calculated and substituted into the following formula to obtain the Rating Based Quotient (RBQ). The constraints were then ranked in ascending order by decreasing RBQ of the different constraints within each category.

Rating Quotient (RBQ)

$$\sum_{i=1}^n = \frac{Fi(n+1-i)}{Nn} \times 100$$

Where;

F_i = frequency of farmers for the i -th problem level

n = total number of steps

i = grade given by the respondents

N = Total number of respondents contacted

Results and Discussion

Socio-economic Characteristics of the Respondents

The socioeconomic characteristics of the respondents show that 42% of beneficiaries were between 41 and 50 years old. Additionally, 34% of non-beneficiaries were between 21 and 30 years old. This means that farmers between the ages of 41 and 50 were more involved in the project and were able to apply the technologies appropriately in this age category. This conclusion is supported by Olaleye et al. (2019) that most farmers had a working age between 21 and 50 years. In addition, the study of Adubi (2013) shows that age-related agricultural experience significantly influences farmers' decision-making regarding risk aversion, adoption of improved agricultural technologies and other production-related decisions. Age has also been found to influence the speed at which families adopt innovations, which impacts family productivity and strategies to improve living conditions (Dercon & Krishna, 2016).

The study found that 70% of project beneficiaries were women and 85% of non-beneficiaries were also women. This means that the main beneficiaries of the intervention were women, as they were involved in the production of small ruminants in several families.

Table 2 shows that the beneficiaries of the intervention were the most educated (99.0%) compared to the non-beneficiaries. This means that among the participating farmers the beneficiaries were more educated and aware of the importance of improved livestock breeds in increasing productivity, which would facilitate the adoption of the CBARDP-supported technologies. Farinde et al. (2005) identified literacy, among other factors, as a variable that positively impacts farmers' use of improved agricultural inputs. Furthermore, Chukwuemeka et al. (2023) found that formal education has a positive influence on the implementation of innovations. This also confirmed the findings of Atiku (2015), who concluded that the participants in CBARD project in Kaduna State had higher education than the non-participants. The study by Anyoh et al. (2013) confirmed that education is important in facilitating understanding of improved agricultural production methods and making farmers more receptive to advice from extension agencies or enabling them to deal with technical recommendations that require a certain level of mathematical skills and literacy require writing skills. The result of Table 2 that shows 50.0% of the beneficiaries and 81.4% of non-beneficiaries had a family size of between 1 and 10 people, with an average of 12 and 7 dependents per family unit being beneficiaries and non-beneficiaries. This means that many people ate from the same pots. Family members can be a good source of agricultural labor, meaning that the importance of household size in agriculture suggests the availability of labor for agricultural production. Table 2 shows that most of the respondents worked primarily in the agricultural sector. Agriculture was the main occupation of heads of households in rural areas. Of the 99 beneficiaries, 17.4% were traders and only 1.0% of the 86 non-beneficiaries were also traders. This suggests that the beneficiaries have diversified their sources of income compared to the non-beneficiaries. This finding is consistent with that of Ajakaiye (2019) and Omonona (2014) that non-farm income is gradually becoming more important, especially for young and educated people.

Table 2: Socio-economic Characteristics of the Respondents (n = 185)

Variables	Beneficiary		Non-Beneficiary	
	Frequency	Percentage	Frequency	Percentage
Sex				
Male	30	30.0	13	15.0
Female	69	70.0	73	85.0
Total	99	100.0	86	100
Marital Status				
Married	96	97.0	74	86.0
Single	3	3.0	11	13.0
Divorced	0	0	1	1.0
Total	99	100	86	100
Age (years)				
20-30	9	9.1	40	14.0
31-40	19	19.2	26	30.2
41-50	42	42.4	12	46.5
51-60	21	21.2	8	9.3
61-70	6	6.1	0	0
71-80	2	2.0	0	0
Total	99	100.0	86	100.0

Table 2: Continued...

Variables	Beneficiary		Non-Beneficiary	
	Frequency	Percentage	Frequency	Percentage
Min	25		14	
Max	80		60	
Mean	47		33	
Household Size				
1-5	13	13.1	35	40.7
6-10	36	36.4	35	40.7
11-15	23	23.2	8	9.3
16-20	15	15.2	6	7.0
21-25	10	10.1	2	2.3
26-30	2	2.0	-	-
Total	99	100	86	100
Min	3		0	
Max	30		21	
Mean	12		7	
Educational Qualification				
Primary	15	15.0	22	32.0
Secondary	26	26.0	21	30.0
Tertiary	37	37.0	17	25.0
Adult education	14	15.0	15	7.0
Quranic	7	7.0	11	6.0
Total	99	100	86	100
Primary occupation				
Artisan	7	7.1	3	4.0
Civil servant	10	10.1	1	10
Farming	65	65.4	81	94.0
Trading	17	17.4	1	1.0
Total	99	100	86	100

Source: Field Survey, 2023

Min = Minimum, Max = Maximum

Farmers' Sources of Information about CBARDP

The result in Table 3 showed that 24.3% of the respondents sourced their information through extension agents. Other significant sources included friends/neighbours/co-farmers (21.7%), radio (13.5%), television (9.8%), and newspapers (8.1%). The finding of the study confirms that the respondents got information about the CBARD project through extension agents' visitation to various households of the farmers involved in the project. This implies that extension agents are the most important source

of information for smallholder farmers. This result corresponds to the findings of Ndagana and Buba (2016), who pointed out that an extension agent was primary and preferred medium used by livestock farmers in Nigeria.

Table 3: Farmer's Sources of Information about CBARD Project

Sources	Frequency	Percentage
Radio	25	13.5
Magazine	15	8.1
Extension agent	45	24.3
Television	18	9.8
Newspaper	15	8.1
Farm article	12	6.4
Social media	10	5.4
Friends/ neighbors/ co-farmers	40	21.7
Newsletter	5	4.7
Others (specify)	0	0
Total	185	100

Source: Field Survey, 2023

Impact of the CBARD Project on the Income of the Respondents

The CBARDP project's impact on farmers' income was assessed using Chow test statistics at a 95% confidence interval. This analysis compares the explanatory power of the regression models for beneficiaries and non-beneficiaries of the project, highlighting the differences in income variance explained by the models. The higher R^2 for beneficiaries (0.85) compared to non-beneficiaries (0.29) indicates that the CBARDP project had a significant positive impact on the income of participating farmers. The F-calculated value exceeding the F-tabulated value at a 95% confidence interval also suggests that the differences in the regression models between beneficiaries and non-beneficiaries are statistically significant. This finding is therefore in congruent with the results of Fadama II project in Niger state which reveals that the intervention influenced the income of beneficiaries compared to the income of non-beneficiaries (Muhammad et al., 2011).

Table 4: Chow Test Statistics Showing Impact of the CBARDP Project on the Income of the Farmers (n = 185) (95% confidence interval)

Group Sample	R^2	Residual sum of square	N	K	F-cal	F-tab	Group Sample
Pooled Samples	0.29	4597871+08	185	6	1.98	1.97	0.29
Beneficiaries	0.85	2358410E+08	99				0.85
Non-Beneficiaries	0.29	196661E+08	86				0.29

Source: Field survey, 2023

(Adjusted R squared = .764)

Respondents Assets Ownership

The results in Table 5 showed that after the CBARD project, there was a notable increase in the acquisition of information resources (e.g., radio, television, VCD) by the respondents. This is an indication that the increased level of information and enlightenment among the respondents because of having access to those information dissemination gadgets. There was an increase in the number of mobile phones and pick-up vans as well

as household items such as refrigerators. Generally, there was an improvement in the rate at which the respondents' acquired assets. This is an indication that over the years the income of the respondents has increased. This indicated that the CBARDP had been able to impact positively on the respondents' standard of living. This is in line with the report of IFAD (2016) on Women's Empowerment Mainstreaming and Networking (WEMAN) under IFAD where the programme reported a concrete positive change in women's living conditions.

Table 5: Distribution of Respondents (beneficiaries) According to Assets Ownership (n = 185)

Assets owned by respondents	No of items Owned before Project	No of items Owned after Project	Differential
Radio	58	82	24
TV	36	53	17
VCD	36	58	22
Refrigerator	20	48	28
Electric Fan	16	23	7
Mobile phones	22	35	13
Bicycle	10	19	9
Motorcycle	25	32	7
Car	3	9	6
Lorry	2	6	4
Pick up Van	8	14	6

Source: Field Survey, 2023

Housing Type Owned by the Respondents

The type of house an individual or group possesses depends mainly on their economic status. Persons with higher income were likely to occupy better housing, as evident in Table 4. Almost half (40.4%) of the beneficiaries owned mud houses with zinc roofs; 33.2% of them lived in cement block houses with zinc roofs. In comparison, 16.3% and 10.1% of the beneficiaries dwelled in mud houses with thatched roofs and cement block houses with aluminium roofs, respectively. On the other hand, most (34.9%) of the non-beneficiaries dwelled in mud houses with zinc roofs, 18.7%, 29.0%, and 17.4% dwelled in mud houses with thatched roofs, mud houses with zinc roofs, while cement block houses with aluminium roof, respectively. This result means that the beneficiaries showed ownership of better housing types, such as cement block houses with zinc and aluminium roofs and this could be attributed to their participation in CBARD (Solomon et al., 2020). But non-beneficiaries, to a large extent, lived in mud houses with zinc roofs.

Table 6: Type of Housing Owned by the Respondents (Beneficiaries/Non-beneficiaries)

Type of house owned	F	%	F	%
Mud building/thatched roof	16	16.3	16	18.7
Mud building/zinc roof	40	40.4	25	29.0
Cement block building/zinc roof	33	33.2	30	34.9
Cement block building/Aluminum roof	10	10.1	15	1.0
Total	99	100	86	100

Source: Field Survey, 2023.

Perceived Benefits of CBARDP on Goat Farming

Table 7 shows that the beneficiaries and non-beneficiaries perceived various benefits of the CBARDP on goat farming, including capacity building, increased livestock yield, access to improved stock, and improved rural infrastructure. The weighted average mean of perceived benefits was 2.84, indicating a high level of perceived benefits. The other major benefit experienced by both the beneficiaries and non-beneficiaries in the study area was the development of skills in goat husbandry, followed by an increase in small ruminant production among the respondents. Data analysis shows that 37.9% of the beneficiaries had an increase in access to improved breeds due to their participation in the CBARD Project. Similarly, 34.4% of the beneficiaries had improved access to veterinary services for their goat business. The study also revealed that the beneficiaries (34.4%) said that the CBARD project Enhanced training and technical support for goat rearing. The CBARDP was able to help 36.0% of the beneficiaries to improve the socio-economic status of their communities. Of 185 respondents, 39.0% of the beneficiaries agreed on improving rural infrastructures. A total of 53 (28.5%) respondents agreed that upgraded equipment and infrastructure were available, 28.5% consented to the efficient use of community resources, and 28.5% of the respondents said CBARD increased their access to financial aid. The results found that 41.9% of the beneficiaries enhanced the use of agricultural technologies. Furthermore, 33.3% of the goat farmers agreed that CBARD encouraged participation in non-farm activities. Similar findings were reported by different authors in their studies related to the impact of goat rearing on the livelihood of the farmers, (Jasvinder, et al., 2020; Mohanty et al 2020; Senait,2012). The results showed a strong perception of the respondents regarding the usefulness of the project, which is consistent with the findings of Gebremedhin and Tegegne (2020).

Table 7: Perceived Benefits of CBARDP on Goat farming (n = 185)

ITEMS	SA	A	UD	D	SD	MEAN	RANK
Capacity building on goat farming.	84 (44.3)	28 (15.1)	0 0	45 (24.2)	31 (16.7)	3.10	1 st
It increases the yield of livestock (goat) produce.	74 (39.3)	67 (36.0)	10 (5.0)	20 (10.6)	15 (7.5)	3.01	2 nd
It increases access to improved stock.	70 (37.9)	31 (16.7)	8 (4.0)	32 (17.2)	45 (24.2)	2.95	3 rd
It encourages participation in livestock (goat) farming activities.	62 (33.3)	45 (24.2)	10 (5.0)	28 (15.1)	49 (24.5)	2.92	4 th
It helps in improving rural infrastructures.	70 (39.0)	31 (16.7)	15 (8.0)	17 (9.1)	44 (22.0)	2.99	5 th
It aids efficient use of community resources.	53 (28.5)	59 (31.7)	0 0	28 (15.1)	45 (24.2)	2.89	6 th
Enhances training and technical support.	64 (34.4)	31 (16.7)	14 (7.5)	48 (24.0)	28 (15.1)	2.80	7 th
It increases access to financial aids.	53 (28.5)	62 (33.3)	13 (6.5)	40 (20.0)	31 (16.7)	2.78	8 th

Table 7: Continued...

ITEMS	SA	A	UD	D	SD	MEAN	RANK
It enhances the use of mechanized agriculture.	31 (16.7)	70 (41.9)	8 (4.0)	56 (30.1)	20 (10.6)	2.77	9 th
It improves the socio-economic status of the community.	67 (36.0)	14 (7.5)	0 0	56 (30.1)	48 (25.9)	2.70	10 th
Increases access to extension services.	50 (26.9)	0 0	20 (10.6)	42 (22.6)	73 (39.2)	2.70	10 th
Improve access to veterinary services.	64 (34.4)	42 (22.6)	15 (8.0)	50 (25.0)	14 (7.5)	2.68	12 th
Availability of upgraded equipment and infrastructure.	53 (28.5)	45 (24.2)	20 (10.6)	36 (18.0)	31 (16.7)	2.67	13 th

Overall Mean = 36.96

Weighted Average = 2.84

Source: Field Survey, 2023.**Constraints to Goat Farming During CBARD Project**

Constraints were categorized into managerial, socio-economic, infrastructural, technological, and marketing constraints. Major constraints included disease outbreaks, lack of veterinary aid, high cost of medicines/treatment, lack of subsidies, and exploitation by middlemen.

Table 8: Constraints Faced by the Goat Farmers (n = 185)

	Constraints	RBQ value	Rank
I	Managerial constraints		
1	Disease outbreak	93.3	1 st
2	Lack of veterinary aid	87.9	2 nd
3	Limited drinking water availability	68.5	3 rd
4	Non-availability of grazing land	37.9	4 th
5	Labour shortage	27.5	5 th
II	Socio-economic constraints		
1	High cost of medicines/treatment	69.1	1 st
2	Theft/Predators	65.4	2 nd
3	Lack of recognition	54.7	3 rd
4	Limited land for farm expansion	40.4	4 th
5	High cost of feed	36.4	5 th
6	High cost of parent stock	35.6	6 th
7	High cost of farm labour	30.4	7 th

Table 8: Continued...

	Constraints	RBQ value	Rank
8	High cost of equipment	25.8	8 th
III	Infrastructural constraints	RBQ value	Rank
1	Lack of subsidies	90.8	1 st
2	Inadequate loan facilities	73.5	2 nd
3	Absence of institutional support	73.5	3 rd
4	Inadequate extension personnel	57.7	4 th
5	Difficulty in getting inputs	46.5	5 th
IV	Technological constraints	RBQ value	Rank
1	Inadequate technical support at doorsteps	75.8	1 st
2	Lack of scientific knowledge	72.1	2 nd
3	Limited training programs on goat rearing	42.5	3 rd
4	Non-availability of improved breed	37.5	4 th
5	Poor veterinary care	27.5	5 th
V	Marketing constraints	RBQ value	Rank
1	Middlemen exploitation	96.0	1 st
2	The poor price paid for the produce	93.5	2 nd
3	Absence of price fixing agency	89.6	3 rd
4	No organized/authorized agents	87.7	4 th
5	Unscientific price fixation	86.4	5 th
6	Lack of marketing information	81.2	6 th
7	Non-availability of markets	79.5	7 th
8	Long distance to market	75.8	8 th
9	Poor infrastructure facilities at hand	72.5	9 th
10	Inadequate transport facility	48.3	10 th
11	Season	47.9	11 th

Source: Field Survey, 2023 **RBQ** = Rank-Based Quotient

Managerial constraints

Disease outbreak was the most severe constraint with a high rank of 93.3. This can have a significant impact on goat farming by affecting the health and productivity of the herd. Insufficient access to veterinary aid was also identified as a major concern (87.9). Lack of this aid can result in increased mortality and reduced productivity. Water scarcity was identified as a significant challenge (68.5) followed by a lack of available grazing land (37.9). Goats had less grazing land and farmers were forced to buy concentrates and feed ingredients for their goats in the summer. Most goat farmers were forced to sell their goats due to inadequate food and nutrition. The labor shortage (27.5) was small and therefore below other management constraints. This means that a larger proportion of goat farmers owned medium-sized herds and managed them independently without employing people to support them. These results are consistent with those of Gopal et al. (2010) wherein most farmers faced problems related to the availability of pastures in summer, disease problems, wildlife attacks on goats, tick problems and shelter problems in rainy and winter weather conditions.

Socio-economic constraints

The high cost of veterinary medicines/treatment (69.1) in goat farming was a serious constraint to farmers. Affordability of veterinary medicines and treatments is crucial to farmers since this can impact the profitability and sustainability of goat farming. This requires interventions such as subsidies or alternative cost-effective solutions. The threat of theft and predators (65.4) is a notable concern affecting goat farming. It emphasizes the need for security measures to protect the goat herd. Lack of recognition of goat farming (54.7) was a noticeable constraint. Recognition of goat farming as a viable and valuable occupation was identified as a socio-economic constraint and such recognition can influence support and policies for goat farmers. Limited land availability for farm expansion was acknowledged (40.4). This implies that the constraint may limit the scalability of goat farming operations. The high cost of animal feed (36.4), the high cost of parent livestock (35.6), the high cost of agricultural labour (30.4) and the high cost of equipment (25.8) are other socioeconomic constraints expressed by farmers due to their severity.

Infrastructural constraints

The absence of subsidies was a critical infrastructural constraint (90.8). Subsidies play a vital role in supporting farmers economically. This implies that a lack of subsidies can increase the financial burden on farmers, potentially hindering their ability to invest in better farming practices. Inadequate loan facilities and absence of institutional support were ranked the same as significant challenges (73.5). Insufficient access to credit can limit farmers' ability to invest in technology, infrastructure, or expansion. Addressing this constraint may involve improving financial services for farmers and adequate financial support is crucial for the growth and sustainability of goat farming. Strong institutional support can therefore provide farmers with advice and resources. Lack of additional staff (57.7) and difficulties in obtaining resources (46.5) were also identified as barriers to goat farming.

Technological constraints

Inadequate technical support at doorsteps was highlighted and ranked high (75.8) which implies that the accessibility to technical assistance is crucial for implementing modern farming practices. Bridging this gap can enhance productivity and efficiency in goat farming. Lack of scientific knowledge was highly recognised as a technological constraint (72.1). This implies that encouraging and providing farmers with access to scientific knowledge can empower them to make informed decisions, adopt new technologies, and improve overall farm management. Limited goat breeding training programs (42.5) and lack of availability of improved breeds (37.5) were also cited as limitations. This emphasizes the importance of capacity-building programmes and continuous education in improving the farmers' skills and knowledge. Hence, improved breeds can enhance productivity and resilience in goat farming.

Marketing constraints

Exploitation by middlemen was the most severe marketing constraint (96.0). Farmers being exploited by middlemen can lead to reduced income. This issue could be addressed through the establishment of fair-trade practices, cooperatives, or direct marketing channels. Inadequate pricing for goat produce was a major concern (93.5). This means that low prices for goat products can hurt farmers' income, while farmers need fair compensation for their efforts and investments. Goat farmers were constrained by the lack of a price regulator or price-setting authority (89.6) and by unscientific pricing (86.4). The introduction of fair pricing and market stabilization mechanisms can help alleviate this limitation. The main marketing barriers identified were lack of adequate marketing information (81.2) and lack of available markets (79.5). Access to market trends and information is critical for farmers to make informed decisions, while market availability is critical for selling goat products.

Results of Tested Hypothesis

The hypothesis that there is no significant difference between the income of beneficiaries and non-beneficiaries was rejected. However, after the estimation, a significant difference was found between the income of the beneficiaries and that of the non-beneficiaries. From the result in Table 9, the average income of beneficiaries (N596,691,238) was significantly higher than that of non-beneficiaries (N102,561,901). The calculated t is 1.98 and exceeds the critical value (two-sided critical) of 1.97 with a 95% confidence interval. The result suggests that the average income of the beneficiaries has increased years after the implementation of the project as they have access to the resources and basic knowledge necessary for the production of small ruminants. The average income of non-beneficiaries has also increased, although it is lower than that of CBARDP beneficiaries. The increase in income of non-beneficiaries was attributed to spill-over effects emanating from beneficiary communities exposing them to livestock production management practices. The results of this study confirm the findings of Owolabi et al. (2018) which concluded that the community development project had a significant impact on the income and living standards of beneficiaries compared to non-beneficiaries.

Table 9: Result of t-test on significant differences between the income of beneficiaries and non-beneficiaries (n = 185)

Variables	Income of Beneficiaries	Income of Non-Beneficiaries
Mean	596691.238	102561.901
Variance	1.56996E+12	3.27866E+12
Observations	99	86
Hypothesized Mean Difference	0	
Df	148	
t Stat	-1.984	
P(T<=t) one-tail	0.033	
t Critical one-tail	1.655	
P(T<=t) two-tail	0.066	
t Critical two-tail	1.97*	

Source: field survey, 2023 * $p \leq 0.05$

Conclusion and Recommendations

The study concludes that the CBARD project had a significant impact on the income of beneficiaries compared to non-beneficiaries, as evidenced by statistical analysis. Beneficiaries experienced positive changes in asset ownership, housing types, and perceived benefits in goat farming. The project contributed to improving the standard of living and socio-economic status of the beneficiaries. Additionally, the study found various constraints faced by goat farmers which include managerial, socio-economic, infrastructural, technological, and marketing constraints. The findings imply the need for continued support and expansion of similar community-based agricultural and rural development programs. This points to the fact that technical and socio-economic support must be provided by the government through a strong monitoring team to promote the sustainability of community projects. The study suggests that the CBARDP has positively impacted the income, asset ownership, and perceived benefits of smallholder farmers, particularly in goat farming. The positive impact on income and asset ownership, particularly through goat farming, indicates that the CBARDP has been successful in improving the economic stability of smallholder farmers. This boost in income can contribute to better standards of

living, reduced poverty levels, and greater resilience against economic shocks within rural communities. The results provide insights into the effectiveness of extension agents in disseminating information and the overall success of the CBARDP in improving rural livelihoods. The results underscore the value of extension agents in facilitating knowledge transfer and technical support, which appears to be essential for the success of such programs. This implies that investing in training and deploying extension workers can be a highly effective strategy to maximize the impact of rural development projects. The study indicates that the CBARDP has not only impacted individual beneficiaries but has likely influenced non-beneficiaries through spillover effects. Future projects should leverage this community-based approach, considering the potential indirect benefits for non-participating households. The influence of the CBARDP beyond direct beneficiaries' points to significant spillover effects, where non-participating community members also benefit from the program's resources and knowledge. This could result in a more inclusive growth model, where improvements within a target group indirectly enhance the broader community's socioeconomic conditions. While the income of non-beneficiaries increased, there is room for further economic empowerment. Programs can explore ways to extend project benefits to non-participants, fostering inclusive and sustainable economic growth across the entire community. The positive correlation between education levels and technology adoption highlights the importance of on-going education initiatives. Implementing literacy and awareness programs can further enhance farmers' understanding of improved livestock breeds and agricultural technologies. Diversification of income sources among beneficiaries underscores the potential for sustainable livelihoods. Future projects may incorporate strategies that encourage income diversification, reduce vulnerability to external shocks, and promote resilience. It is noteworthy that farmers were constrained by disease outbreaks, the high cost of veterinary medicine/treatment, lack of subsidies, inadequate technical support, and middlemen exploitation. These constraints could have negative effects on farmers' incomes. However, the government may directly address them to increase farmers' incomes and make the project more attractive to the general populace.

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References

- Adeoye, S.A. (2020). Goat Diseases and Control Strategies in Nigeria: A Review. *Nigerian Veterinary Journal*, 41(2), 99-110.
- Adeyemo, R., & Kehinde, A.D. (2021). Community Driven Development: The Case of Fadama II Cooperatives in Alleviating Poverty in a Developing Country. *Contemporary Agriculture*, 70(1-2): 46-53.
- Adubi, O.T. (2013). An economic analysis of rice processing and marketing in Osun and Ogun States, Nigeria. Unpublished Ph.D. thesis, Obafemi Awolowo University, Ile-Ife, Nigeria, Pp 48-50.
- African Development Fund, ADF. (2015). Federal Republic of Nigeria: Community-Based Agriculture and Rural Development Project Appraisal Report. Agriculture and Rural Development Department Central and Western Regions.

- Ajakaiye, O. (2019). "Economic Development in Nigeria: A Review of Experience" Paper presented at CBN Annual Monetary Policy Forum, November 2017.
- Anyoha, N.O., Nnadi, F.N., Chikaire, J., Echetama, J.A., Utazi, C.O. & Ihenacho, R.A. (2013). Socio-economic factors influencing climate change adaptation among crop farmers in Umuahia South Area of Abia State, Nigeria, *Net Journal of Agricultural Science*, 1 (2), 42 – 47.
- Apata, O.M. & Saliu, O.J. (2016). Impact Assessment of Fadama Project on Agricultural Development in Kwara State, Nigeria. *American Journal of Experimental Agriculture*, 10(4): 1-7, 2016, Article no. AJEA.13718. <http://www.sciencedomain.org/>
- Atiku, J. A. (2015). Impact of Community Based Agriculture and Rural Development Project on Participants Income and Output in Kaduna State, Nigeria. Unpublished M.Sc. Thesis. Ahmadu Bello University, Zaria, Kaduna State, Nigeria.
- Chukwuemeka, V. O., Jun, W. & Juliet, O.E. (2023). Does tertiary education promote technological innovation sustainability? The role of national intellectual capital. Empirical evidence. *Economic research-ekonomiska istraživanja*, 36(3), 2264374. <https://doi.org/10.1080/1331677x.2023.2264374>.
- Dercon, S. & Krishnan, P. (2016). Income portfolios in rural Ethiopia and Tanzania: Choices and constraints. *Journal of Development Studies*, 32 (6): 850 – 875.
- Doherty, C. (2007). *An introduction to econometrics*. Oxford University Press. 194. ISBN 978-0-19-928096-4.
- Dross C.R. (2016). Understanding farm level technology adoption: Lessons learned from CIMMYT. Economic working paper No. 30–07, Mexico, D.F.
- Ebenehi, O., Saddiq, N.M., Oyinbo, O., Muhammad, A. A. and Ichi, J. O. (2012). Impact of The National Poverty Eradication Programme (NAPEP) on Rural Livelihood in Kogi State, Nigeria. *Publication of Sokoto Journal of the Social Sciences*, 2(1). Pg 26 – 36.
- Esuruoso, G.O., Abubakar, A.L. & Olaniyi, J.O. (2020). Factors Influencing Goat Reproduction and Breeding Strategies in Nigeria: A Review. *Journal of Animal Science Advances*, 10(5), 3180-3196.
- Farinde, A.J., Soyobo, K.O. & Oyedekun, M.O. (2005). Exploration of beekeeping as a coping strategy in a deregulated economy. *Journal of Agricultural Extension*, 8: 76-83. ISSN 1119 944X. Published by the Agricultural Extension Society of Nigeria (AESON).
- Federal Ministry of Agriculture and Rural Development (2006). *African Development Bank Community-Based Agriculture and Rural Development Projects Information Handbook*.
- Gebremedhin, B., & Tegegne, A. (2020). Community-based breeding programs for small ruminants in Ethiopia: Achievements, challenges, and lessons learned in Achieving sustainable cultivation of sheep (3) pp. 145-167. Burleigh Dodds Science Publishing.
- Global Data Lab. (2021). "Human Development Indices." Retrieved 28th December 2022.
- Gopala, G., Veeranna, K. & Kumbar, S. (2010). Impact of Goat Rearing among Livestock Interest Groups on Empowerment of Poor Rural People. *Semantic Scholar Page*. <https://api.semanticscholar.org/CorpusID:168148267>
- Idrisa, Y.L. (2019). Analysis of Determinants of Soya Bean Production Technology Adoption by Farmers in Southern Borno, Nigeria. Unpublished Ph.D. thesis submitted to the Department of Agricultural Economics and Extension Services, University of Maiduguri, Nigeria, pp. 1–4.
- International Fund for Agricultural Development (IFAD). IFAD's strategy in Nigeria; (2007). Available online: <http://operations.ifad.org/web/ifad/operations/country/home/tags/nigeria> (Retrieved Dec. 4, 2009)
- International Fund for Agricultural Development, IFAD. (2015). Investing in Rural People in Nigeria. The Rural Poverty Portal. Available at <http://www.ruralpovertyportal.org>.
- International Fund for Agricultural Development, IFAD. (2016). Investing in Rural People in Nigeria. The Rural Poverty Portal. Available at <http://www.ruralpovertyportal.org>
- International Fund for Agricultural Development, IFAD. (2021). Federal Republic of Nigeria: Country Strategy Opportunity Programme. Report Review of Executive Board, Ninety-Ninth Session, April 21st -22nd. Rome.

- Jasvinder, S.S., Sharad, K. & Amandeep, S. (2020). Effect of Goat Rearing on Farmers' Income. *International Journal of Livestock Research*, 10(8), 89-97. Doi:http://dx.doi.org/10.5455/ijlr.20200603_064757.
- Kwara Agricultural Development Project. (2023). A Progressive Report of CBARDP was presented to the AfDB Supervision Mission.
- Michael, A.A. (2016). Effect of Participation in Community-based Agriculture and Rural Development Project on Socio-economic Status of Rural Dwellers in Northern Nigeria. *Asian Journal of Agricultural Extension, Economics & Sociology* 9(3): 1-13.
- Mohanty, M., Das, B.C. & Nanda, S.M. (2020). Economic Impact of Goat Farming on Livelihood of Goat Farmers of Nabarangpur District of Odisha, India. *International Journal of Current Microbiology and Applied Sciences*, 9 (1). <https://doi.org/10.20546/ijcmas.2020.901.020>.
- Muhammad, H.U., Umar, B.F., Abakar, B.Z. & Abdullahi, A.S. (2011). Impact of Fadama II Project on Rural Livelihoods Wellbeing in Niger State, Nigeria. *Journal of Tropical Agriculture, Food, Environment and Extension*, 10 (3), 43 – 48.
- National Bureau of Statistics (NBS). (2023). Nigerian Gross Domestic Report Q1 2023. Federal Government of Nigeria. FCT, Abuja.
- Ndagana, M.K. & Buba, A. (2016). The Importance of Agricultural Extension Agents as Source of Information in Lavun Local Government Area of Niger State, North Central Zone, Nigeria. *Journal of Production Agriculture and Technology*, 12 (1): 89-94. <http://www.patnsukjournal.net/currentissue>.
- Okpeku, M., Yakubu, A., Peters, S.O. & Ikeobi, C.O. (2016). Sustainable Goat Farming in Nigeria: A Review. *Sustainable Agriculture Research*, 5(3), 1-12.
- Olaleye, R.S., Ibrahim, M. & Ojo, M.A. (2019). Probit Analysis of Women's Access to Agricultural Inputs in Bosso Local Government Area, Niger State, Nigeria. *Journal of Agricultural Extension*, 13 (2):1-9.
- Olorunju, S.A., & Mapiye, C. (2020). Small Ruminant Nutrition Research in Nigeria: A Review of Past Efforts and Future Directions. *Tropical Animal Health and Production*, 52(6), 3329-3341.
- Omejie, N.P. & Ogbu, M.O. (2015). Rural Development and Food Security Programmes in Nigeria: Issues and challenges. *Journal of Policy and Development Studies*, 9 (2), 1-10.
- Omonona, B.T. (2014). Poverty and its Correlates among Rural Farming Households in Kogi State, Nigeria. Unpublished Ph.D. Thesis University of Ibadan, Pp 51- 63.
- Othman, Y. (2016). Impact of Community-Based Organization on Rural Development in Kano State. Unpublished MSc. Thesis, Department of Agricultural Economics, Ahmadu Bello University Zaria, Nigeria. Pp 64-67.
- Owolabi, K.E., Okunlola, J.O. & Mafimisebi, T.E. (2018). Influence of Participation in Community and Social Development Projects on Beneficiaries' Income in Ondo and Kwara States, Nigeria. *Int. J. Agr. Ext.*, 6(3), 203-214.
- Sabarathnam, V.E. (2002). Rapid, Relaxed and Participatory Rural Appraisal (Participatory Learning and Action) for Research and Extension in Agriculture (For crops and livestock). Vamsaravath Publishers, Hyderabad-500 040. India.
- Senait, H.M. (2012). Impact of Goat Development Project on Livelihood Assets: The Case of Northern Red Sea Region in Eritrea. Unpublished Master Degree Thesis. Van Hall Larenstein University of Applied Sciences. Wageningen, Netherlands.
- Solomon, A. A., Esther, O.F. & Michael, F. (2020). Adoption of community-based agricultural development project technologies among smallholder farmers in Kwara State, Nigeria. *Agricultura Tropica Et Subtropica*, 53(3),127–135. DOI: 10.2478/ats-2020-0013.
- Statista. (2022). Share of GDP by Agricultural Sector in Nigeria 2021. Retrieved from www.statista.com/statistics/1207940/share-of-gdp-by-agricultural-sector-in-nigeria/. World Bank Group. (2018). Retrieved from <https://data.worldbank.org/indicator/SP.RUR.TOTL.ZS?end=2021&locations=NG&start=2021&view=bar>.
- The World Bank Group (2021). Agricultural Development Projects in Nigeria. Available online at <http://inweb90.worldbank.org/oed/oeddoctlib.nsf/DocUNID>.