EFFECT OF FADAMA'S AGRICULTURAL CREDIT AND FARM INPUTS PROVISION ON POVERTY REDUCTION OF BENEFICIARY HOUSEHOLDS IN BENUE STATE

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ABSTRACT

The study examined the effect of Fadama agricultural credit and farm input provision on poverty reduction of beneficiary households in Benue state Nigeria. The study employed a cross-sectional survey research design, thereby thereby making the questionnaire the main instrument of data collection to explore the relationship between the variables. Multi-stage and stratified random sampling were used to select 400 Fadama user group members in Benue State. The study employed the Probit Regression to achieve the study's objectives. From the data analysis, the study revealed that Fadama credit to household programmes have a significant negative effect on household income. The study further discovered that Fadama-information and communication technology programme has an insignificant positive effect on household income. The study recommends that Governments should increase support for rural agriculture and make sure farmers receive subsidized farm inputs on schedule. Additionally, In order to promote the efficient use of digital agricultural technology for long-term poverty alleviation and sustainable rural development, it is also necessary to upgrade rural ICT infrastructure and give farmers sufficient training.

Keywords: *Fadama. Poverty Reduction, Cross-sectional Survey, Probit Regression, and Benue.*
Jel Classification: *Q18, I32, C83, C25, & Q10*

Introduction

One of the most important issues facing humanity in the twenty-first century is poverty. For hundreds of millions of people worldwide, especially in developing countries, agriculture is their main source of income. Over half of the world's production of nine major staple crops, such as rice, cassava, maize, and sorghum, is produced on farms smaller than five hectares, demonstrating the vital role smallholder farming plays in ensuring global food security (Zero Carbon Analytics, 2025). Smallholder farming is estimated to support 500 million households globally. The 1.5 billion smallholder farmers worldwide experience the highest rate of poverty of any industry in the global economy, despite their crucial role (Nature4Climate, 2024).

As recently as 2019, undernourishment averaged 29% and poverty rates were 44% in low-income nations; the COVID-19 pandemic sent an additional 120 million people back into extreme poverty (UC Davis MRR Lab, 2022).

The problem is especially severe in sub-Saharan Africa. Despite government pledges and global initiatives to improve agricultural systems, data from more than 55,000 smallholder farms in six African nations between 2008 and 2019 shows not only a failure to increase productivity but also a general decline in total factor productivity of about 3.5% annually (Fuglie et al., 2024). Inadequate rural infrastructure, high input costs, limited loan availability, and poor extension services are all major contributors to this ongoing agricultural stagnation. These structural obstacles keep rural farming households stuck in cycles of poverty.

The most populous country in Africa, Nigeria, is not an exception to this trend. Despite the fact that agriculture accounts for more than 25% of the nation's nominal GDP (NBS, 2025), rural areas continue to be disproportionately impoverished. According to the National Bureau of Statistics' (NBS) 2022 Multidimensional Poverty Index (MPI) survey, 63% of Nigerians, or around 133 million people, live in poverty, with 72% of rural populations falling into this category (NBS, 2022). The geographic distribution of poverty is highly skewed: 65% of Nigeria's impoverished, or roughly 86 million people, live in the country's northern states, where over 70% of Nigerians live in poverty, compared to roughly 30% in the south (World Bank, 2025; NBS, 2022). Northern states continue to rely mostly on subsistence farming, and poverty reduction in these areas is unlikely to be durable in the absence of focused agricultural measures.

The National Fadama Development Project (NFDP), a multi-phase rural development initiative aimed at the productive use of fadama lands (low-lying floodplains and seasonally flooded areas), was initiated by the Nigerian government with World Bank support after realizing the strategic importance of agriculture in reducing poverty. Fadama I, the initial phase, was created in the early 1990s with funding from the World Bank to support basic, inexpensive, enhanced irrigation technologies (Olomola, Adesugba & Yusuf, 2023, World Bank, 2022).

To further boost the earnings of farmers and fishermen in fadama areas, the Federal Government introduced Fadama II in 2004, building on its success (Ogwuche, 2023). Beneficiary incomes increased by 63% under Fadama II (World Bank, 2024). The third phase, Fadama III, was a US$450 million program that was implemented in all 36 states as well as the Federal Capital Territory. It was approved by the World Bank in July 2008 and aimed to reduce rural poverty, improve food security, raise rural land and water resource users' incomes sustainably, and support the Millennium Development Goals (World Bank, 2010). Under Fadama III, priority crop yields—cassava, rice, sorghum, and tomatoes—rose by more than 55% on average, while recipient households' real incomes climbed significantly, sometimes by as much as 154% (World Bank, 2024).

Giving beneficiary households access to agricultural financing and farm inputs via Fadama Community Associations (FCAs) and Fadama User Groups (FUGs) is a key component of the Fadama program's operational strategy. Since these are the very barriers that keep rural farming households in poverty,

agricultural financing and farm input support are widely acknowledged as being essential to unlocking smallholder agricultural output. Research on Fadama III conducted in a number of states has verified that the program had a favorable effect on beneficiaries' output, income, and overall standard of living (Agbareyo & Okwoche , 2014).

For example, research from Edo State showed that farmers' lives were significantly improved by the World Bank-assisted Fadama initiative (Aigbedion & Omoruyi, 2018). Similarly, a study conducted in Delta State discovered that the provision of agricultural support services, including as credit, fertilizer, and seedlings, greatly increased the farming activities and revenue of FUG members (Odoh et al., 2012). In a midline impact analysis of Fadama III in Benue State, Kwon-Ndung et al. (2018) came to the conclusion that the project should be maintained as a model for encouraging poverty reduction among Nigerian rural communities.

Significant study gaps still exist despite this expanding body of knowledge, especially when it comes to Nigeria's North Central geopolitical zone. Benue constitute a state of vital agricultural importance with an abundance of fadama lands and a population that is primarily rural farmers. However, the state continues to experience poverty and underutilization of agricultural resources, which is made worse by restricted access to farm inputs and loans.

The extent to which Fadama's particular efforts in agricultural credit and farm input provision have resulted in quantifiable poverty reduction outcomes for recipient households in this region has not been adequately investigated in previous studies. Thorough empirical research is required to close this gap. It is therefore based on this backdrop that this study examined the effect of Fadama agricultural credit and farm inputs provision on poverty reduction of beneficiary households in Benue states.

Statement Problem

In Nigeria's North Central states, specifically Benue state poverty among rural agricultural households continues to be a concerning development issue. The evidence that is now available indicates that poverty has not decreased at a rate comparable with the federal government's consistent investment in agricultural development programs, including several stages of the National Fadama Development Project. According to the NBS 2022 MPI, 65% of Nigeria's impoverished live in the country's northern states, where poverty rates typically surpass 86%. The North Central zone contains a number of states where multidimensional deprivation is still very high (NBS, 2022; World Bank, 2025).

With recorded increases in revenue and productivity in states like Benue, Kogi, Edo, Anambra, and Delta, the Fadama program has been praised as a successful agricultural intervention. However, it is questionable if the program's two most resource-intensive elements—farm input support and agricultural credit—have independently and significantly reduced poverty among beneficiary households, particularly in the Benue state.

Poverty was mentioned by Kogi State farmers as the biggest barrier to participation (mean = 3.89), while program facilitators identified the most significant obstacles as the high cost of farm supplies and

the absence of credit facilities (mean = 3.38 each) (Shittu, 2020). These results indicate that while credit and input support are theoretically and empirically essential to the program's capacity to reduce poverty, little is known about their individual and combined effects on household welfare in Benue state Nigeria.

Furthermore, rather than focusing on the precise functions of agricultural finance and farm input availability in poverty reduction, prior research on Fadama in the North central particularly in Benue state has tended to concentrate on broad impact assessments of program components. An important gap in the analysis of agricultural policy is the absence of state-specific, disaggregated data from the North Central region.

It is challenging for policymakers to assess if program redesign and improvement are required or whether the allocation of resources toward credit and input support within the Fadama framework is producing the best returns on poverty reduction in this region in the absence of such evidence. Therefore, by carefully analyzing the impact of Fadama's agricultural credit and farm input provision on poverty reduction among recipient households in certain Benue state of Nigeria, this study aims to close this information gap.

In line with the study's objective to examine the effect of Fadama agricultural credit and farm inputs on poverty alleviation among beneficiary households in Benue State, and in accordance with the problem statement, the study established the hypothesis;

H_{01}: Fadama's agricultural credit and farm inputs has no significant effect on poverty reduction of beneficiary households in Benue state, Nigeria.

2. Literature Review

2.1 Conceptual Clarification

2.1.1 Concept of Fadama

Fadama is a Hausa name for irrigable land-usually low-lying and flood plains, underlain by shallow aquifers found along Nigeria's major river systems. According to Echeme and Nwachukwu (2021), Fadama is called Jande in Tiv,Eji in Idoma, Efu' Ite in Igala and Lambu in Alago languages. Such lands are especially suitable for irrigated crop production and fishing and traditionally provide feed and water for livestock. Kudi, Akpoko and Banta (2008) assert that Fadama refers to an age-old tradition in Hausa where land that floods on seasonal basis allows for the growth of a variety of crops under small-scale irrigation farming system. The World Bank (2009) described Fadama Assisted Project as an agricultural diversification programme aimed at improving the income of the participating farmers on a sustainable basis.

Fadama also refers to a seasonally flooded area used for farming during the dry season. It is defined as alluvial, lowland formed by erosion and depositional actions of the rivers and streams. They encompass land and water resources that could easily be developed for irrigation agriculture (Qureshi, 1989). Fadama are typically waterlogged during the rainy season but retain moisture during the dry season.

The areas are considered to have high potential for economic development through appropriate investments in infrastructure, household assets and technical assistance. When Fadama spread out over a large area, they are often called 'Wetlands' (Nkonya 2008; and Ingawa, 2004).

2.1.2 Concept of Poverty Reduction

Poverty has been defined and operationalized in a variety of ways across disciplines, institutions, and historical periods. It is a complicated, multidimensional, and often debated topic. Poverty is fundamentally defined as a state of extreme material deprivation, or the incapacity of individuals or households to achieve their basic necessities. According to Rauhut and Hatti (2021), poverty is a complicated human state marked by a persistent or ongoing lack of the resources, capacities, options, security, and authority required to enjoy a decent standard of living. The structural causes of poverty also define it. Inadequate nutrition, homelessness, illness, illiteracy, social exclusion, high infant and maternal mortality, chronic unemployment, and a lack of productive assets are all signs of extreme poverty in developing nations, which is recognized from a development perspective as a serious problem with grave implications for human wellbeing (Intechopen, 2022). The intentional, methodical process of reducing the prevalence, severity, and depth of poverty within a particular population by focused policies, programs, and interventions that increase access to opportunities, resources, and social protection is known as poverty reduction.

2.2 Theoretical Framework

The main theoretical framework used in this study to explain how each Fadama III intervention component creates distinct livelihood capital categories that facilitate poverty reduction is the Sustainable Livelihoods Approach. Through training programs, workshops, and extension services that provide recipient farmers with enhanced agricultural practices, business management skills, and technical knowledge, capacity building interventions align with human capital development (Chambers & Conway, 1992; Fang et al., 2021). This enhanced human capital increases agricultural productivity by improving technical efficiency in input use, reducing crop losses, and enabling adoption of higher-yielding cultivation methods, thereby raising farm output and household income.

By removing liquidity barriers that keep low-income farmers from making investments that boost productivity, agricultural credit and the provision of farm inputs enable the purchase of better seeds, fertilizers, pesticides, and equipment that significantly boost agricultural output (Ellis, 2000; Gautam & Andersen, 2021). Financial capital improves technical efficiency and yields by allowing farmers to maximize input application time rather than postponing purchases because of financial restrictions. Having access to working capital makes it possible to engage in capital-intensive but more lucrative endeavors like raising cattle, horticulture, or agro-processing, which yield larger returns than producing subsistence crops (Scoones, 1998).

Adoption of ICT services is a modern expansion of the SLA paradigm that includes social and information capital elements (Scoones, 2009, 2015; Dzanku et al., 2023). ICT services enable more informed decisions about production planning, input sourcing, and output marketing that increase

profitability by reducing information asymmetries that disadvantage smallholder farmers in input and output markets. By identifying the best times and places to sell, negotiating better prices, and avoiding unscrupulous middlemen, market price information systems help farmers increase their net revenue (Ellis, 2000). Without the need for actual extension agents, digital extension services offer technical expertise on pest control, weather forecasting, and better practices, resulting in the development of human capital on a larger scale and at a reduced cost. According to the hypothesis, each Fadama III component should have a beneficial impact on raising living standards through asset accumulation and capability expansion as well as improving household income through increases in productivity and market efficiency.

2.3 Empirical Literature

A cohort study by Ukaa (2024) evaluated the impact of Fadama III development programs on the earnings and productivity of farmers in Benue State. The study involved 400 participants from six local government areas, utilizing questionnaires, focus group discussions, interviews, and direct observations for data collection. Results indicated notable income and agricultural output improvements among participants, particularly in poultry, catfish, rice, and cassava production. The percentage of farmers earning above N30,000 per month increased from below N18,000 to 44.5% after program participation. However, the study revealed a lack of long-term sustainable income growth, with only 15% of participants able to save more than N30,000 monthly. This highlights deficiencies in savings mobilization and fund management, prompting recommendations for better strategic management of agricultural production and savings within farmer groups.

A meta-analysis of sixteen impact evaluation studies conducted by Idan, Oduola, and associates (2024) explored agricultural support interventions and their effects on multidimensional poverty from 2019 to 2023. The findings indicated that households receiving support experienced a 4% reduction in poverty compared to control groups. The study highlighted the inadequacy of monetary measures like income in reflecting the diverse deprivations faced by the poor, advocating for the use of the Foster, Greer, and Thorbecke (FGT) index to better assess poverty depth and severity. Furthermore, it concluded that agricultural initiatives contribute to lowering food prices, increasing employment, and enhancing income, thereby reducing poverty significantly.

According to the World Bank's (2024) retrospective, Nigeria's Fadama initiatives significantly boosted beneficiary incomes, with increases of 63% under Fadama II and up to 154% under Fadama III. Average yields for priority crops like cassava, rice, sorghum, and tomatoes rose over 55% across participating states. The Fadama Community Associations (FCAs) and Fadama User Groups (FUGs) were crucial for agricultural finance and input delivery, contributing to these outcomes. The program's success in poverty reduction was attributed to the Community Driven Development (CDD) model, empowering beneficiaries in program design and implementation, which fostered local ownership and engagement.

Adeyemi et al. (2020) investigated the impact of Fadama III User Group (FUG) involvement on food security among rural households in Benue State. Utilizing a multi-stage sampling technique, the study collected data from both participants and non-participants. Results indicated that FUG involvement

significantly improved food security, with participants experiencing lower food insecurity levels. The provision of farm inputs was identified as a critical factor in reducing food poverty, emphasizing the importance of access to improved seeds and fertilizers through FUG. The study also highlighted the need for post-harvest management support and ongoing funding for FUG initiatives to enhance food security further.

Using data from 625 respondents in Benue State, Babatunde, Adenuga, and Fakayode (2019) utilized endogenous switching regression models to assess the effects of Fadama III Additional Financing (AF) on rural food security. The study revealed that 46% of participating households and 56% of non-participating households faced food insecurity. Participation in Fadama III AF resulted in a significant reduction of 31% in food insecurity ($p < 0.01$) among beneficiaries. A counterfactual simulation indicated that non-participants would have seen a 28% reduction in food insecurity had they benefited from the program. The analysis demonstrated that access to improved farm inputs and credit under Fadama III AF contributed to notable welfare gains for rice farming households, with participants exhibiting significantly higher profit efficiency than non-participants. The findings support the extension of Fadama III AF to enhance the wellbeing of agricultural households.

Terwase (2018) examined the financial impact of the World Bank-funded Fadama III project in Makurdi Local Government Area, Benue State, from 2008 to 2013, using data collected from 250 beneficiaries through structured questionnaires. The study revealed significant economic improvements, including a 72.2% success rate in asset acquisition, 94.1% in input provision, a 98.2% increase in participant yields, and a 97% rise in annual income. However, it noted poor implementation of advisory and input support, which hindered service delivery quality. The study urged the continuation of the program's successes and further investigation into the factors influencing its effectiveness.

Kwon-Ndung, Ater, and Aye (2018) conducted a rigorous evaluation of the Fadama III Agricultural Development Project in Benue State, assessing its impact on poverty alleviation among 314 families across 20 Local Government Areas. Using standardized questionnaires and STATA for data analysis, the study compared the incomes and quality of life of Fadama III beneficiaries and non-beneficiaries. Key findings revealed that access to farm inputs like seeds and fertilizer significantly enhanced technical efficiency, with beneficiaries achieving a technical efficiency value of 0.79 compared to 0.71 for non-beneficiaries. The program also helped reduce income disparity, as indicated by a lower Gini coefficient among beneficiaries. The study recommended continued farmer training and an extension of the program to sustain efficiency gains.

In a study on assessment of information and communication support of *FADAMA* III in Ogun State by Ishola, Shabi and Oludipe (2016), majority of the respondents (96.67%) agreed that information and communication support of *Fadama* III can bring change from traditional to conventional farming and also most respondents strongly agree (45%) and agree (34.67%) respectively to the fact that information and communication support will increase the dissemination of important information of *Fadama* III.

3.0 METHODOLOGY

The major source of data was mostly used in the investigation. A systematic questionnaire was used to gather primary data from family heads or informed adults who were actively participating in Fadama program activities. The questionnaire was created to collect information on important factors associated with the study's goals, such as demographic traits, rural infrastructure development, and Fadama capacity building. In order to objectively and empirically assess the impact of Fadama Projects on poverty reduction in Benue State through communication with respondents through questionnaire and interview methods, this study used a cross-sectional (survey) research methodology.

3.1 Sample Size and Sampling Techniques

26,528 Fadama III beneficiary families in Benue state that engage in crop farming, livestock raising, fishing, and agro-processing make up the study population (NFCO, 2021).

The Taro Yamane (1967) formula was used to calculate an acceptable sample size:

$$n = \frac{N}{1 + N\,(e\,)\text{^}2}$$

Where

n = Sample size

N = Population size

e = Level of significance (5%)

1 = constant

Benue State: Population (N) = 26,528

$$n = \frac{26,528}{1 + 26,528(0.05)\text{^}2}$$

$$n = \frac{26,528}{1 + 66.32}$$

$$n = \frac{26,528}{67.32}$$

$n = 394$

$n \approx 400$.

To guarantee a representative sample, a multi-stage, stratified sampling process was used:

Three Local Government Areas (LGAs) were chosen from Benue State's three senatorial districts using stratified random selection.

From each selected LGA, three Fadama Community Associations (FCAs) were selected at random. Two Fadama User Groups (FUGs) are picked at random from each selected FCA.

Additionally, stratified sampling was used to choose respondents according to their involvement in the five main Economic Interest Groups (EIGs): marketing, crop farming, livestock farming, fish farming, and agriculture value adds. To make sure the chosen participants fulfilled certain requirements, such as the length of program participation and active involvement in EIGs, a judgmental sampling technique was used.

3.2 Data Analysis

The sustainable livelihoods approach, which offers a comprehensive viewpoint on poverty alleviation and rural development, serves as the foundation for the analytical framework. The choice of variables and the interpretation of the findings were influenced by this framework. Both descriptive and inferential statistical methods were used in the investigation. Questionnaire responses and demographic features were summarized using descriptive statistics. The study used Ordered Probit regression for inferential analysis. The ordinal structure of the variables utilized in this study examining the impact of Fadama project indicators on the poverty reduction indicator (household income) makes this model choice appropriate.

The model specification is based on empirical data from assessments of comparable community-driven rural development initiatives as well as the theoretical foundation of the sustainable livelihoods approach. The following is the model's specification:

$Yih = f(Fadproj)$…….....(i)

$Yih = f(Hiih)$ ……..…….…..…..(ii)

$Fadproj = f(FadCreditih, FadICTih)$…….....…(iii) $HIih = \beta_0 + \beta_1 FadCreditih + \beta_2 FadICTih + \varepsilon ih$……..….(iv)

Where:

Yih	= Poverty Reduction
Fadproj	= Fadama Projrct Dimensions
FadCreditih	= Agricultural credit & input via groups
FadICTih	= Using Fadama enabled information and communication
Hiih	= Household Income
LSih	= Living Standard
β_0	= Intercept
β_1, β_2	= Intercept

4.0 RESULTS AND DISCUSSION

Notably, only 350 of the 400 copies of the surveys that were sent to the respondents—or 88% of the total—were correctly filled out and returned. 50 copies, or 12% of the total, were not returned and could not be utilized for the analysis. As a result, the 350 completed and returned questionnaires served as the basis for the analysis.

Table 2: Demographics of the Respondents

Demographic Characteristics	Category	Frequency	Percentage
Participant Identity	Crop farmer	185	52.90
	Livestock farmer	95	27.10
	Agro-produce marketer	55	15.70
	other	15	4.30
-Total		**350**	**100**
Gender	Male	210	60.00
	Female	141	40.00
Total		**350**	**100**
Highest Education Qualification	No formal education	35	10.00
	Primary school certificate	70	20.00
	Secondary school certificate	110	31.40
	Diploma/NCE	75	21.90
	Undergraduate degree	45	12.90
	Postgraduate degree	10	2.90
	Others	5	1.40
Total		**350**	**100**
Years of farming/Marketing Experience	1-5 years	65	18.60
	6-10 years	95	27.10
	11-15 years	85	24.30
	16-20 years	60	17.10
	Over 20 years	45	12.90
Total		**350**	**100**
Land Holding Size	Less than 1 hectare	120	34.30
	1-3 hectares	145	41.40
	4-6 hectares	60	17.10
	Over 6 hectares	25	7.10
Total		**350**	**100**

Source: Field Survey, (2026)

The respondent's demographics are shown in Table 2. In terms of participant identity, crop farmers make up the bulk of respondents (52.9%), followed by livestock farmers (27.1%) and agro-produce marketers (15.7%). According to the distribution, the Fadama project mainly affects crop cultivation in the area, however livestock farming is also heavily impacted. According to the gender distribution,

male respondents made up 60% of the sample, while female respondents made up just 40%. This suggests that respondents of both genders held these opinions. The higher proportion of male respondents suggests that men are the primary participants in Fadama activities and are showcasing agricultural leadership roles in Benue State.

Table 2 also reveals that most participants have some formal education, with secondary school being the respondents' greatest level of schooling. The remarkable inclusivity of the Fadama project is demonstrated by the involvement of individuals from various educational backgrounds. This wide range of educational backgrounds highlights the project's potential and shows how it may engage and benefit various rural demographic segments. Table 2 shows a strategic blend of agricultural and marketing experience, with 51.4% having six to fifteen years of experience. The Fadama project's long-term success and sustainable agricultural development depend on this ideal mix of experienced and novice practitioners, which greatly improves knowledge transfer and innovation uptake. The bulk of responders (75.7%) have three hectares or less of land. This implies that small to medium-sized farmers, who are common in rural agricultural settings in many developing nations, are the main beneficiaries of the Fadama project.

Table 3: Descriptive Statistics on Fadama Agricultural Credit and Input Impact on Poverty Reduction in North-Central Nigeria

SN	Statement	SA	A	N	D	SD	Mean	Remarks
1.	Getting access to fertilizers and improved seeds increased my crop yields	73 (48.0%)	189 (40.0%)	15 (7.0%)	43 (4.0%)	11 (1.0%)	4.31	Agreed
2.	Availing crop insurance allowed me to protect incomes against weather risks	65 (21.0%)	201 (27.0%)	11 (15.0%)	38 (26.0%)	35 (11.0%)	3.21	Agreed
3.	The flexibility in collateral free credit enabled investing in equipment to raise productivity	70 (32.0%)	187 (35.0%)	18 (12.0%)	45 (14.0%)	30 (7.0%)	3.71	Agreed
4.	Low cost loans facilitated construction of water harvesting structures on my farm	78 (27.0%)	195 (33.0%)	9 (14.0%)	37 (18.0%)	31 (8.0%)	3.53	Agreed
5.	Credit support aided in transporting and selling produce to farther markets for better prices	61 (34.0%)	198 (36.0%)	12 (10.0%)	42 (14.0%)	37 (6.0%)	3.78	Agreed
	Mean	*3.71*						
	Cronbach Alpha	*0.81*						
	Valid N (listwise)	*350*						

Source: Field Survey, 2026
Decision Rule:

If mean <3.5 the respondents Disagree
If mean ≥3.5 the respondents Agree

Table 3 shows the responses to the Likert-scale question and the sample mean (x) regarding Fadama agricultural credit and input impact on poverty reduction in North-Central Nigeria. For access to fertilizers and improved seeds increasing crop yields, 73 (48.0%) of the respondents strongly agreed that getting access to fertilizers and improved seeds increased their crop yields, 189 (40.0%) agreed, 15 (7.0%) were neutral, while 43 (4.0%) and 30 (1.0%) disagreed and strongly disagreed respectively, giving a sample mean of 4.31. This shows that beneficiaries strongly agreed that access to quality inputs significantly boosted their agricultural productivity; hence, the mean is ≥ 3.71.

For crop insurance protecting incomes against weather risks, 65 (21.0%) of the respondents strongly agreed that availing crop insurance allowed them to protect incomes against weather risks, 201 (27.0%) agreed, 11 (15.0%) were neutral, while 38 (26.0%) and 35 (11.0%) disagreed and strongly disagreed respectively, giving a sample mean of 3.21. This shows that respondents had mixed responses about the effectiveness of crop insurance, with limited uptake and awareness; hence the mean is < 3.71.

For the question on collateral-free credit enabling equipment investment, 70 (32.0%) of the respondents strongly agreed that the flexibility in collateral free credit enabled investing in equipment to raise productivity, 187 (35.0%) agreed, 18 (12.0%) were neutral, while 45 (14.0%) and 30 (7.0%) disagreed and strongly disagreed respectively, giving a sample mean of 3.71. This shows that respondents agreed that accessible credit facilities helped them invest in productivity-enhancing equipment; hence the mean is ≥ 3.71.

For the question on low-cost loans facilitating water harvesting construction, 78(27.0%) of the respondents strongly agreed that low-cost loans facilitated construction of water harvesting structures on their farms, 195(33.0%) agreed, 9 (14.0%) were neutral, while 37(18.0%) and 31 (8.0%) disagreed and strongly disagreed respectively, giving a sample mean of 3.53. This shows that most respondents agreed that affordable credit supported farm infrastructure development; hence the mean is ≥ 3.71.

For the question on credit support aiding transportation and market access, 61 (34.0%) of the respondents strongly agreed that credit support aided in transporting and selling produce to farther markets for better prices, 198 (36.0%) agreed, 12 (10.0%) were neutral, while 42 (14.0%) and 37 (6.0%) disagreed and strongly disagreed respectively, giving a sample mean of 3.78. This shows that most respondents agreed that credit assistance improved their market reach and pricing opportunities; hence the mean is ≥ 3.71.

On average, the respondents agreed that Fadama agricultural credit and input components effectively contributed to poverty reduction, as evidenced by the overall mean of 3.71 and supported by the high internal consistency shown by the Cronbach Alpha of 0.81; hence, the overall mean is ≥ 3.5.

Table 4: Regression Result (Ordered Probit Regression Model)

Variable	Coefficient	Std. Error	Z-Statistic	Prob.
FADCreditih	-0.613417	0.259034	-2.368099	0.0263
FADICTih	0.774627	1.315720	0.588748	0.5615
	Limit Points			
LIMIT_2:C(3)	0.636950	0.250405	2.144326	0.0320
LIMIT_3:C(4)	1.560085	0.293487	5.315682	0.0000
LIMIT_4:C(5)	-0.220387	0.190711	-1.155609	0.0003
LIMIT_5:C(6)	3.978738	0.324797	12.24993	0.0000

Pseudo R-squared	0.116598	Akaike info criterion	
Schwarz criterion	2.582215	Log likelihood	-434.3137
Hannan-Quinn criter.	2.542403	Restr. log likelihood	-491.6377
LR statistic	114.6478	Avg. log likelihood	-1.240896
Prob(LR statistic)	0.000001		

Source: Authors computation from E-views 13.0 result output, (2026).

Using the Ordered Probit Regression Model, the study investigated the impact of Fadama agricultural credit and farm input support on reducing poverty among beneficiary households in a subset of Nigeria's North Central States. The estimated model yielded a Pseudo R-squared value of 0.116598, indicating that the explanatory variables in the model agricultural credit and ICT-enabled support account for approximately 11.7% of the variability in poverty reduction across beneficiary families. In household-level cross-sectional studies, when human welfare is impacted by a number of socioeconomic factors outside the model, this is acceptable even though the explanatory power seems moderate. At 1%, the Likelihood Ratio (LR) statistic is statistically significant at 114.6478 with a probability value of 0.000001. This suggests that the explanatory factors collectively have a significant impact on reducing poverty among beneficiary households and that the overall model is statistically fit.

With a probability value of 0.0263 and a coefficient of -0.613417, the availability of farm inputs and agricultural financing is statistically significant at 5%. This suggests that households are less likely to stay in higher poverty categories and more likely to move to lower poverty categories when they have greater access to Fadama agricultural credit and farm supplies through groups. The negative sign denotes a negative correlation between the level of poverty and agricultural credit/input availability. Thus, increased availability of subsidized farm supplies, fertilizers, seeds, agricultural loans, and production assistance greatly reduces poverty in recipient households.

The coefficient of Fadama-enabled information and communication technology is 0.774627 with a probability value of 0.5615, which is statistically insignificant. This implies that the usage of ICT resources made available by the Fadama program has a favorable but negligible impact on the study area's beneficiary households' ability to reduce poverty.

The high likelihood value suggests that the effect is not strong enough statistically to influence poverty reduction throughout the study period, despite the positive coefficient suggesting that ICT usage may improve wellbeing and reduce poverty.

Discussion of Findings

The assumption that the distribution of farm inputs and agricultural finance considerably lowers poverty among beneficiary households is in line with the economic realities of rural Nigeria, especially in the North Central region where agriculture continues to be the primary source of income. Farmers that have access to agricultural financing are able to get past the financial obstacles that typically keep smallholder farmers from investing in better seeds, fertilizers, herbicides, irrigation systems, and contemporary farming equipment. Farmers in many rural communities rely largely on personal savings or unofficial borrowing, which reduces output. Therefore, by reducing budgetary limitations and increasing production capacity, the Fadama program plays a significant role. Additionally, agricultural input support lowers production costs, boosts crop yield, and increases output for farmers. Higher household income, better food security, higher living standards, and eventually a decrease in poverty are all correlated with increased agricultural output. This explains why better welfare conditions are more likely to be experienced by households that get agriculture inputs and Fadama financing.

The outcome is consistent with the study by Ukaa (2024), practical realities seen in Nigeria, where government-funded agricultural intervention programs like the Fadama Project, Anchor Borrowers Program, and other rural financing initiatives frequently aim to improve rural livelihoods and lower poverty among smallholder farmers. Compared to non-beneficiaries, households in the majority of rural areas that have access to subsidized inputs and financing facilities are able to grow larger farms, implement better technologies, and produce more market surplus. The development finance theory, which contends that access to financing improves low-income households' ability to make profitable investments and generate income, is further supported by the negative correlation between agricultural credit and poverty.

However, the discovery that ICT facilitated by Fadama has a favorable but negligible impact on poverty alleviation reflects the current state of Nigerian rural technology adoption. Mobile phones, internet-based extension services, weather information systems, and market information platforms are examples of ICT tools that have the potential to increase agricultural productivity, but their efficacy in many rural communities is still restricted. This is in agreement with study conducted by Ishola, Shabi and Oludipe (2016) who discovered that information and communication support has a positive effect on poverty reduction.

Conclusion

Using the Ordered Probit Regression Model, this study investigated the impact of Fadama agricultural finance and farm input provision on poverty reduction among recipient households in a subset of Nigeria's North Central States. The results showed that the Fadama program's agricultural credit and farm input support have a major impact on beneficiary households' efforts to reduce poverty. In

particular, it was discovered that having access to subsidized farm inputs and agricultural loans greatly decreased the probability of households staying in higher poverty categories, enhancing household welfare and living standards.

Information and communication technology (ICT) provided by Fadama had a favorable but statistically insignificant impact on poverty alleviation, according to the study. This indicates that even though ICT has the potential to increase household welfare and agricultural productivity, its effects on rural farmers have not yet been fully realized because of issues like low digital literacy, poor infrastructure, poor internet connectivity, and limited technological adoption in rural communities.

Overall, the study comes to the conclusion that direct agricultural support mechanisms—like easily accessible loan facilities and prompt farm input delivery—remain more efficient tools for reducing poverty among rural farming households in the study area. Therefore, the results highlight how crucial it is to improve institutional support for rural farmers, increase access to subsidized farm supplies, and strengthen agricultural financing programs.

Recommendation

Governments should increase support for rural agriculture and make sure farmers receive subsidized farm inputs on schedule.

Government and pertinent development organizations should maintain and grow the Fadama intervention program. In order to promote the efficient use of digital agricultural technology for long-term poverty alleviation and sustainable rural development, it is also necessary to upgrade rural ICT infrastructure and give farmers sufficient training.

Development agencies should prioritize and expand agricultural credit and input provision programs by establishing sustainable financial institutions that serve rural populations effectively. Government and donor agencies should support the development of rural banking infrastructure, promote innovative lending mechanisms such as group-based credit, and ensure adequate supply chains for quality agricultural inputs. The integration of credit provision with technical assistance and market linkage support is crucial for maximizing income generation impacts.

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