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Assessment of the Impact of NG-CARES Agricultural Assets on Poverty Reduction among Small-Scale Farmers in Plateau State, Nigeria

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Abstract

The COVID-19 pandemic exacerbated poverty and disrupted livelihoods across Nigeria, with Plateau State experiencing severe socio-economic setbacks. In response, the Federal Government implemented the Nigeria COVID-19 Action Recovery and Economic Stimulus (NG-CARES) Programme, providing agricultural assets for production and mitigating food loss and waste (DLI 2.3) to support small-scale farmers. This study assesses the impact of these assets on poverty reduction among beneficiaries in Plateau State. Employing an explanatory sequential mixed-methods design, data were collected from 302 beneficiaries through questionnaires, complemented by interviews and observation. Descriptive statistics, thematic analysis, and paired t-tests were used to analyse quantitative and qualitative data. Findings reveal that post-harvest losses reduced markedly, with the proportion of farmers reporting losses below 30% increasing from 19.23% pre-intervention to 65.38% post-intervention. The paired t-test indicates a statistically significant improvement in household living standards (mean difference = 0.65, $t = 6.872$, $p < 0.000$). Thematic analysis highlights the programme's effectiveness in targeting vulnerable groups, enhancing productivity, and generating income opportunities, though financial constraints, poor road infrastructure, and insecurity limited its coverage. Guided by the Sustainable Livelihoods Approach, the study concludes that NG-CARES agricultural assets significantly contribute to poverty reduction and improved livelihoods among smallholder farmers, emphasizing the need for expanded funding, infrastructure development, and sustained technical support to maximize impact.

Keywords: Agricultural Assets, NG-CARES Programme, Post-Harvest Loss Reduction, Poverty Reduction, Small-scale farmers

Introduction

The outbreak of the COVID-19 pandemic in 2020 significantly disrupted socio-economic activities across the globe and reversed progress made in poverty reduction. In Nigeria, the pandemic intensified existing vulnerabilities, pushing a large proportion of citizens into poverty due to loss of livelihoods, declining business activities, and reduced government revenues. In response to these adverse effects, the Federal Government of Nigeria established the Nigeria COVID-19 Action Recovery and Economic Stimulus (NG-CARES) Programme in collaboration with the World Bank as an emergency intervention to support state-level recovery efforts (NG-CARES Programme, 2021).

The NG-CARES Programme was designed as part of President Muhammadu Buhari's broader poverty alleviation agenda aimed at lifting 100 million Nigerians out of poverty, while mitigating the socio-economic fallouts of COVID-19. The Programme Development Objective (PDO) of NG-CARES is to expand access to livelihood support, food security services, and grants for poor and vulnerable households and firms through a Community Driven Development (CDD) approach. The intervention operates across three key Result Areas:

increasing cash transfers and livelihood support; enhancing food security and ensuring safe functioning of food supply chains; and facilitating the recovery of Micro and Small-Scale Enterprises (MSEs) (World Bank Group, 2025). Under Result Area 2, which focuses on agriculture and food systems, four Disbursement Linked Indicators (DLIs) are implemented: Agricultural Inputs and Services (DLI 2.1); Labour-Intensive Agricultural Infrastructure (DLI 2.2); Agricultural Assets for Production and Mitigating Food Loss and Waste (DLI 2.3); and Upgrading Wet Markets (DLI 2.4) (NG-CARES Programme, 2021).

On this note, the NG-CARES Programme in Plateau State commenced in 2021 as part of the national rollout (Laravel, 2021). Implementation is coordinated through three delivery platforms: the Community and Social Development Agency (CSDA) for Result Area 1, FADAMA NG-CARES for Result Area 2, and the Plateau State Microfinance Development Agency (PLASMIDA) for Result Area 3 (Plateau State Operation Manual, 2021). The FADAMA unit of the Plateau State Ministry of Agriculture is responsible for implementing Result Area 2 interventions. This study focuses specifically on DLI 2.3—Agricultural Assets for Production and Mitigating Food Loss and Waste under FADAMA. This component provides farmers with agricultural assets aimed at increasing food production capacity and supporting small-scale primary processing to reduce post-harvest losses (Plateau State Operation Manual, 2021). By strengthening productive capacity and reducing food losses, the intervention is expected to enhance farmers' incomes, improve household food security, and ultimately reduce poverty.

The relevance of this intervention becomes evident when examined against Plateau State's poverty profile. Even before the pandemic, poverty rates were high—51% in 2018 and 55.1% in 2019 (Sasu, 2022). Following the outbreak of COVID-19, multidimensional poverty in the state rose to 84%, reflecting severe deprivations in health, education, and living standards (NBS, 2022). Plateau State was also ranked among states with the worst poverty indices, recording an index of 0.365 (Oyekanmi, 2022), and has been classified among the poorest states in Nigeria (Folagbade & Olateju, 2024).

The pandemic also adversely affected state revenues. Plateau State's internally generated revenue (IGR), which had increased from ₦12.73 billion in 2018 to ₦16.47 billion in 2019, declined sharply to ₦8.33 billion in 2020 due to the economic slowdown (Jugu *et al.*, 2021). Globally, the World Bank reported that COVID-19 pushed over 70 million additional people into extreme poverty (Gwaison, Apeh, & Gwaison, 2021). However, despite notable performance under the Independent Verification Agency (IVA) assessments—where Plateau State ranked third place among top-performing states and earned approximately ₦26.3 billion in disbursements (Dinju, as cited in Chollom, 2024)—financial constraints have limited the scope and consistency of interventions. Dandam, (as cited in Laravel, 2021) noted that FADAMA farmers are faced with the challenge of bad roads. Therefore, inadequate funding and poor rural road infrastructure have hindered the expansion of Agricultural Assets for Production and Mitigating Food Loss and Waste intervention to all eligible beneficiaries.

Given the persistently high poverty levels in Plateau State despite ongoing intervention, and there is limited empirical evidence specifically assessing the impact of Agricultural Assets for Production and Mitigating Food Loss and Waste on poverty reduction among beneficiaries. Understanding whether and to what extent this intervention has improved income levels,

reduced vulnerability, and enhanced livelihood resilience is critical for informing policy decisions, improving implementation strategies, and ensuring sustainable poverty alleviation. It is against this backdrop that this study assesses the impact of NG-CARES Agricultural Assets for Production and Mitigating Food Loss and Waste on poverty reduction among beneficiaries in Plateau State, Nigeria.

The following research questions provided guide to the study: What is the impact of NG-CARES agricultural assets for production and mitigating food loss and waste on poverty reduction among beneficiaries in Plateau State? The main objective of the study is to assess the impact of NG-CARES agricultural assets for production and mitigating food loss and waste on poverty reduction among beneficiaries in Plateau State. The hypothesis for the study stated in null form, states that the NG-CARES agricultural assets for production and mitigating food loss and waste has no significant impact on poverty reduction among beneficiaries in Plateau State. The study is limited to the period within 2019-2025, and FADAMA delivery platform in Plateau State serve as the covering area for investigation.

Literature Review and Theoretical Framework

Concept of Poverty Reduction

Poverty is complex and dynamic, it extends beyond low income to encompass persistent deprivation in essential human needs such as food, shelter, healthcare, education, security, and access to economic opportunities. It reflects long-term structural disadvantages affecting individuals, households, communities, and even entire nations, thereby undermining the possibility of a decent standard of living. Poverty exists in every society and constitute a threat to the progress of any society (Tsanni, 2021; Nwambuko *et al.*, 2023).

In the Nigerian context, poverty remains a critical development challenge. As of 2022–2023, Nigeria ranked among the countries with the largest population living in extreme poverty globally. Reports indicate that over 70 million Nigerians were living in extreme poverty in 2022, representing about one-third of the population, while estimates for 2023 placed the poverty rate at approximately 38.9%, translating to about 87 million people below the poverty line (World Poverty Clock; World Bank Group, 2024). With rapid population growth and slow economic expansion, poverty reduction efforts have struggled to keep pace, and projections suggest that the number of Nigerians living below the national poverty line may increase further in the coming years. However, successive governments in Nigeria have introduced numerous poverty reduction programmes as part of national development strategies.

Conceptually, poverty reduction refers to deliberate policy measures and interventions aimed at improving the welfare of individuals and households by raising income and consumption levels above the poverty threshold while simultaneously addressing non-monetary deprivations. It involves expanding access to quality education, healthcare, infrastructure, productive assets, secure land tenure, information, and sustainable economic opportunities (Bununu, 2020; Ibor & Amos, 2023). Effective poverty reduction therefore requires comprehensive strategies, strong institutional frameworks, and sustained political commitment. Similarly, Norfund (2024) emphasizes that poverty reduction is most effective when economic modernization and urban growth are combined with investments in rural infrastructure—

particularly roads, electricity, and agriculture—and when governments reinvest economic gains into public services and social protection systems. In particular, increasing agricultural productivity has been identified as having an immediate and significant impact on poverty, especially in agrarian economies where rural poverty is prevalent.

Agricultural Assets for Production and Mitigating Food Loss and Waste and Poverty Reduction

Agricultural assets for production and mitigating food loss and waste refer to the set of physical and technological resources that enable farmers to transform inputs into outputs, improving productivity, and enhancing resilience. These include land, livestock, facilities, buildings, equipment and machinery use for farming that increases production efficiency and reduces losses among agricultural households (Richer & Shoemaker, 2018; Minnesota Statutes, 2022). Food loss is defined as “the edible amount of food [that is] available for human consumption but is not consumed.” It is defined at any point in the supply chain as any food produced that could be eaten but that is not. Certainly, food grown to maturity but not harvested and left in the field for any reason and food harvested but extracted from the supply chain for whatever reason would be included as food loss. While, “food waste” is referred to as a subset of food loss. It is seen as the direct result of human negligence or decisions. For instance, flood damage to crops often is referred to as food loss, but a decision not to harvest, regardless of the underlying reasons, would be considered food waste. In summary, the distinction is often that those latter in the supply chain (consumers) waste, while earlier actors (growers, distributors, etc.) experience food loss (Minor, Thornsby, & Mishra, 2020).

Consequently, the unproductive use of natural resources such as land and water, resulting from food loss and waste, promote hunger and poverty. However, lack of access to finance is a primary barrier to investing in FLW interventions across supply chains. Evidence suggests that targeted interventions—such as improved input selection, climate-resilient crop varieties, mechanized harvesting, appropriate storage facilities, processing technologies, cold-chain systems, and farmer training—can significantly reduce losses while improving productivity and market access. Hence, reducing FLW exist at each stage of the FSC, that is, from production down to consumption. (Gromko & Abdurasalova, 2019).

Within this context, the NG-CARES Agricultural assets for Production and Mitigating Food Loss and Waste in Plateau State provide farmers with agricultural assets such as: Processing machines for rice, maize, and tomatoes to increase capacity for food production and small-scale primary processing to mitigate food loss and waste. However, the support for these assets prioritize women and youth friendly assets and the Programme shall provide capacity building and training to the beneficiaries on the proper operation and maintenance of the assets. Beneficiaries are organized into Farmers Community Associations comprising 40–100 members, targeting small-scale farmers, widows, and persons with disabilities, along the agricultural value chain affected by COVID-19 (Plateau State Operation Manual, 2021). The programme strategically links agricultural asset provision with food loss reduction, enhanced value addition, and improved livelihoods.

Review of Related Empirical Studies

Kotyкова and Babych (2019), examined the Economic Impact of Food Loss and Waste. The study seeks to identify the level of economic damage and lost revenue as a result of the food loss and waste, as well as to identify potential benefits for the agricultural land use in reducing those losses. The study is based on empirical research methods as well as on the author's methods of assessment of economic impact of food loss and waste. The study assesses the level of economic losses caused by food loss and waste in Ukraine. The analysis for the study was conducted in terms of regions and product types, and the methodology proposed by Food and Agriculture Organization (FAO) was used to calculate the food loss and waste for each type of product in Ukraine. The study found that it has been empirically proven that food loss and waste result in significant economic damage and lost revenue, and that the reduction of food loss and waste has positive environmental and social consequences. The study recommended that the most important task is to draw the attention of food manufacturers to the problem of food waste and food by-products. And the easiest way to achieve this is by using indicators understandable for them, namely income and profit. Therefore, with respect to the NG-CARES Agricultural Assets for Production and Mitigating Food Loss and Waste, the suggested recommendation is a welcome development that will also serve in the reduction of poverty via ensuring food security in Plateau State.

Kusumowardani, Tjahjono, Lazell, Bek, Theodorakopoulos, Adrikopoulos, and Priadi (2022), analyzed a circular capability framework to address food waste and losses in the agri-food supply chain: The antecedents, principles and outcomes of circular economy. The study investigated growers, distributors and retailers in the agri-food supply chain, in order to develop a Circular Capability Framework. The study adopted the use of qualitative (interview) method to investigate SMEs within the Indonesian Agri- food supply chain, and thematic analysis was utilized. The study found that food loss and waste pose a critical threat to future food security in developing nations and undermines efforts to curtail emissions to meet climate change targets, and that there is limited research exploring how SMEs' operations generate food waste. The study suggested that more research should be carried out due to limited literature. Comparatively, this current study is different because it is a post-COVID-19 investigation unlike the other studies, therefore seek to fill this gap in literature by contributing to the body of knowledge.

Theoretical Framework

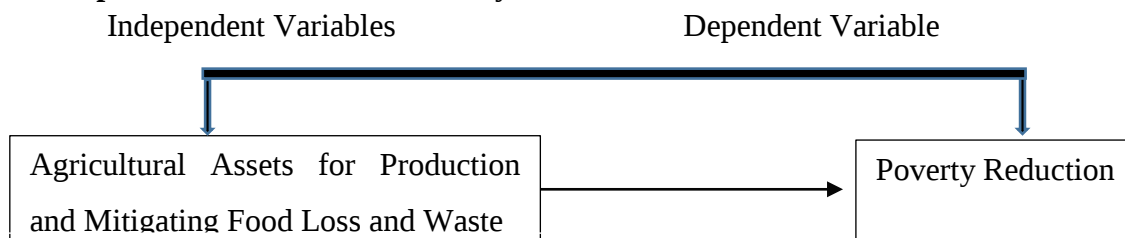
The theoretical framework for this study is Sustainable Livelihood Approach (SLA) propounded by Chambers and Conway (1992), While Ian Scoones and the United Kingdom (UK) Department for International Development (DFID) further modified it from an approach to a framework and methodology in 1998 and 1999 respectively. The SLA is a method of analyzing and changing the lives of people experiencing poverty and disadvantage. It is a participatory approach based on the recognition that all people have abilities and assets that can be developed to help them improve their lives. This approach helps design interventions that strengthen resilience and reduce vulnerability to poverty (Oxfam *et al.*, 2024).

Moreover, the element of the theory is identified by Chambers and Conway, where they stated that sustainable development requires increasing capacity of rural people to influence and control their future on a long-term basis, a goal that can be achieved by strengthening capacity, supporting equity and fostering empowerment. They identified the key Components of SLA which form the basis for the theory. These are: Livelihood Assets (Capitals) – People rely on different assets to sustain their livelihoods such as: Human capital (skills, education, health); Social capital (networks, relationships, social support); Natural capital (land, water, forests, biodiversity); Physical capital (infrastructure, tools, transport); and Financial capital (savings, credit, income sources); Vulnerability Context – External shocks, trends, and seasonality (e.g., economic crises, climate change) affect livelihood sustainability; Policies, Institutions, and Processes – The impact of government policies, laws, and organizations on people's ability to access assets; Livelihood Strategies – The choices people make to secure income, improve well-being, and manage risks; and Livelihood Outcomes – Improved income, reduced vulnerability, better food security, and sustainable resource use (Morse, 2024)..

In relation to this theory, this elements of the theory explains Agricultural Assets for Production and Mitigating Food Loss and Waste, which provide equipment, storage facilities, processing tools for beneficiaries, the SLA ensures Physical Capital adds value through tools and infrastructure for production and storage. Likewise, Natural Capital serve to reduce post-harvest losses, making natural resource use more sustainable. These attempts will strengthen the Financial Capital of the beneficiaries by enhancing profitability through value addition and market access. In addition, this will lead to improve food security and income stability for the beneficiaries as their Livelihood Outcomes.

Sustainable livelihood approach has been criticized for its omission of some of the critical factors that link to the creation of livelihoods in rural communities. Also, it has been criticized of the use of the household as the unit of analysis by gender theorists, and it has failed to provide the understanding of how livelihoods have come to be: through what processes, policies and mechanisms, both short and long term. It has also been criticized for its omission of some of the critical factors that link to the creation of livelihoods in rural communities (Natarajan *et al.*, 2022; Makondo (2022). Despite this criticism, the researcher still fine SLA more appropriate or suitable for the study.

Conceptual Framework of the Study



Source: Researcher's Computation, 2025

The conceptual framework present both the independents and dependent variables for investigation. The Agricultural Assets for Production and Mitigating Food Loss and Waste

represent the Independent Variable (IV), while Poverty Reduction represent the Dependent Variable (DV) for the study.

Methodology

The study adopted the use of explanatory sequential design a mixed methods approach, incorporating both quantitative (questionnaire) and qualitative (interview, and observation) data as the primary sources of data. Hence, secondary data were obtained from relevant sources such as: The Plateau State Overview report on the NG-CARES Programme (2021), FADAMA NG-CARES Achievement Report, (2025); and The Nigeria Covid-19 Action Recovery and Economic Stimulus (NG-CARES) Programme, (2021); World Bank Poverty Index, and The National Bureau of Statistics (NBS) on the Multidimensional Poverty Index (2022). The population for the study consist of about 5899 beneficiaries. Hence, questionnaires were administered to 357 beneficiaries as the sample size derived using Krejcie and Morgan (1970) table. On the other hand, one facilitator from FADAMA was interviewed and referred to a Informant D in the interview scheduled. The study employed the use of a checklist for the observation. The study adopted the use of a multi-stage sampling technique. The study utilized both quantitative and qualitative data analysis techniques. Hence, data collected via questionnaires were analyzed using descriptive statistics, while data via interview and observation were analyzed using thematic analysis. However, the hypothesis was tested using paired t-test with the aid of Statistical Package for Social Sciences (SPSS) version 25 to compute for the t-value and p-value at 5% (0.05) level of significance and at 95% confidence level. Therefore, the decision rule was to reject the null hypothesis where $p < 0.05$ and fail to reject it where $p > 0.05$.

Data Presentation and Analysis

Based on the 357 sample size for the study as indicated, questionnaires were administered to the 357 respondents and 302 were validly filled and returned for data presentation and analysis, thus 85% is the rate of returned.

Socio-Economic Characteristics of Respondents

In this section, the frequency distribution and percentage of participants are presented based on their demographic characteristics, which include the following as per this study: Age, Household size, Sex, Marital status, Educational level, and Occupation.

Table 1: Socio-Economic Characteristics of Respondents (n = 302)

Variable	Percentage (%)	Mean $\pm$ SD
Age Group (years)		51.08 $\pm$ 12.51
31–40	19.23	
41–50	42.31	
51–60	3.85	
61–70	30.77	
> 71	3.85	

Household Size

1–5	15.38	
6–10	73.08	—
11–15	11.54	
> 15	-	

Sex

Male	46.15
Female	53.85

Marital Status

Married	69.23	—
Single	30.77	

Educational Level

Primary	-
Secondary	-
Tertiary	100

Occupation

Farming	100
Trading	-
Poultry	

Source: Field Survey 2025

Table 1 presents the socio-economic characteristics of the respondents. The age distribution indicates that the respondents had an average age of 51.08 years, suggesting that the beneficiaries were largely within the economically active and productive age group. The largest proportion of respondents (42.31%) fell within the 41–50 years age bracket, implying that the NG-CARES interventions largely reached mature adults who are capable of actively participating in programme activities and utilizing the support effectively. The household size distribution shows that 73.08% of the respondents had a household size of 6–10 members, representing the largest proportion. This indicates that the programme supported beneficiaries with relatively large household sizes and higher dependency burdens, which may increase household vulnerability to poverty.

With regard to sex distribution, females constituted 53.85% of the respondents while males accounted for 46.15%. This suggests that although the NG-CARES programme reached both genders, participation was slightly higher among women, reflecting the programme's potential role in promoting gender inclusion and supporting women who are often more vulnerable to poverty. The marital status distribution reveals that a majority (69.23%) of the respondents were married, while 30.77% were single. Married individuals typically have greater household responsibilities, and this pattern suggests that the programme effectively targeted households that may face higher economic pressures and vulnerability.

The educational level of respondents shows that all beneficiaries (100%) possessed tertiary education. This high level of literacy implies that the respondents likely had the capacity to understand and effectively engage with programme interventions, adopt improved practices, and utilize the support provided. Finally, the occupational distribution indicates that 100% of the respondents were engaged in farming, making agriculture the dominant occupation among the

beneficiaries. This confirms that the intervention was primarily directed at farming households. Since farming communities are often highly vulnerable to livelihood shocks, this focus reflects the programme's alignment with the state's agricultural profile and its efforts to strengthen agricultural livelihoods as a pathway for poverty reduction.

Descriptive Statistics

The research objective is to assess the impact of NG-CARES agricultural assets for production and mitigating food loss and waste on poverty reduction among beneficiaries in Plateau State. This is presented in tables based on responses gotten from the field.

Table 2: Type of Asset/Support Received (n = 302)

Type of Asset/Support	Percent (%)
Tomato Processing Machine	30.77
Maize Thresher	34.62
Motorize Sprayer and Maize Planter	15.39
Maize Processing Machine	19.23
Total	100.00

Source: Field Survey 2025

Table 2 shows the distribution of agricultural assets provided under the NG-CARE programme in Plateau State shows a deliberate focus on enhancing processing and mechanization capacity among beneficiaries. The maize thresher was the most widely distributed asset, received by 34.62% of respondents, suggesting that threshing was a major bottleneck in the production chain. This was followed by tomato processing machines, received by 30.77%, addresses perishability challenges within the tomato value chain. The provision of maize processing machines (19.23%), indicating support for value addition and improved post-harvest efficiency, while motorized sprayers and maize planters (15.39%) reflect investments in mechanized crop establishment and crop protection. Overall, the mix of assets demonstrates a targeted effort to reduce drudgery, improve processing efficiency, and strengthen productivity across multiple value chains.

In an interview the respondent representing NG-CARES Agricultural Assets for Production and Mitigating Food Loss and Waste from FADAMA attest to the distribution of items to beneficiaries and raised a concern that:

“The intervention in form of assets given to beneficiaries should be properly used to the benefit of the people so that beneficiaries will enjoy and the FADAMA NG-CARE can in turn give report to the financiers, who will really appreciate that what they have given is properly utilized and that there is more food in circulation so that people will recover properly from the COVID-19 negative effect” (Informant D, 13th September, 2025).

Table 3 Post-Harvest Loss Before Intervention (n = 302)

Loss Category	Percent (%)
<=30%	19.23
31–45%	19.23
46–60%	61.54
Total	100.00

Source: Field Survey 2025

Table 3 indicate that before the NG-CARE intervention, respondents reported high levels of post-harvest losses, indicating inefficiencies in the handling, processing, and storage of agricultural products. A majority 61.54% experienced losses between 46–60%, which is extremely high and poses a direct threat to household income and food security. Only 19.23% reported losses below 30%, demonstrating that very few farmers were operating efficiently. The prevalence of high loss levels highlights the urgent need for improved processing machines, storage technologies, and better handling practices, thereby justifying the intervention.

Table 4 Post-Harvest Loss after Intervention (n = 302)

Loss Category	Percent (%)
<=30%	65.38
31–45%	34.62
Total	100.00

Source: Field Survey 2025

Table 4 shows that after beneficiaries received agricultural assets such as threshers, sprayers, and processing machines; there was a marked improvement in post-harvest loss outcomes. The proportion of farmers reporting losses below 30% increased dramatically to 65.38%, compared to just 19.23% before the intervention. Additionally, losses within the 31–45% range rose to 30.77%, while the highest loss category (46–60%) completely disappeared. These results clearly show that the NG-CARE agricultural support played a significant role in reducing wastage, improving processing speed, and preserving product quality. The shift toward lower loss categories underscores the effectiveness of the intervention in enhancing post-harvest management and improving overall productivity.

Test of Hypotheses

The null hypothesis (H₀) states that: The NG-CARES agricultural inputs assets for production and mitigating food loss and waste have no significant impact on poverty reduction among beneficiaries in Plateau State.

Table 5: Paired t-Test: Living Standard Before and After Asset Support

Variable	Obs	Mean	Std. Err.	Std. Dev.
Living Before (1=Poor, 2=Average, 3=Good, 4=Very Good)	302	2.19	0.079	0.402
Living After	302	2.85	0.072	0.368
Difference (After – Before)	302	0.65	0.095	0.485
t-value		6.872		
Degrees of freedom		301		
p-value (two-tailed)		0.000		

Source: Field Survey 2025

Table 5 proves that the paired t-test provides statistical evidence of the impact of the intervention on household living standards. Before receiving the agricultural assets, respondents' average living standard score was 2.19, indicating that most households were living between

“poor” and “average.” After the intervention, the mean living standard increased substantially to 2.85, suggesting a shift toward the “good” category for many households. The mean difference of 0.65 is large relative to the measurement scale and falls within a confidence interval of 0.458 to 0.850, indicating a reliable improvement.

The t-value of 6.872 with 25 degrees of freedom, and a p-value of 0.000, confirms that the improvement in living standards is statistically significant at the 1% level. This means the observed improvement is not due to chance. The results strongly indicate that access to improved agricultural assets enhanced income, reduced losses, increased efficiency, and ultimately contributed to better household well-being among beneficiaries. Hence, the decision rule stated that when the p-value is greater than the level of significance at 0.05 the decision rule: fail to reject the null hypothesis. Therefore, the p-value of $0.000 < 0.05$ = The NG-CARES agricultural inputs assets for production and mitigating food loss and waste has significant impact on poverty reduction among beneficiaries in Plateau State.

Thematic Analysis of Interviews

This section presents the thematic analysis of interview data obtained from an informant representing agricultural assets for production and mitigating food loss and waste, who is tag as Informant D. Thus, the interview questions and responses were coded and organized into patterns of meaning. These patterns were grouped into seven (7) themes reflecting the impact of the programme on poverty reduction in Plateau State.

NG-CARES Programme Objectives and Poverty Reduction Strategy

Informant emphasized that the programme aims to support vulnerable households, stimulate economic activities, and mitigate the socio-economic effects of COVID-19. The NG-CARES programme under the FADAMA delivery platform in Plateau state responded to intervene on challenges that food insecurity has incurred as a result of the global pandemic, because COVID-19 devastated a lot of economies, farming, and small businesses were affected. Therefore, the goal of the Fadama NG-CARES is to assist the farmers that were affected by the pandemic, to help them settle back to the farming business. So, we can have adequate food supply (Informant D, 13th September, 2025).

Beneficiary Targeting and Inclusion Mechanisms

This theme revealed that the selection of beneficiaries is guided by a criterion: The selection of beneficiaries has always been a peculiar task, the NG-CARES Agricultural Assets for Production and Mitigating Food Loss and Waste, the agency looks for the poorest of the poor since everybody was affected by the COVID-19. So, how to determine the poorest of the poor is another challenge. Though, people come with applications to submit, applying to benefit from the intervention. However, the facilitators go to communities, interface with the people, they check their economic status to see if they are indeed very poor before selecting them. It is not everybody that we engage or interface with that gets our approval we have to look at their farm activities and in fact their houses. So, the facilitators engage with the people, the

gauge their economic standard and possibly ask the community leaders what is the economic status of this person before considering the person (Informant D, 13th September, 2025).

Monitoring, Transparency, and Accountability Mechanisms

This theme observed that monitoring, transparency and accountability are key mechanisms that must be in place to guarantee the success in implementation of the programme at each point.

At the local level we have the local government, desk officers and facilitators. We go to individuals' farms. Whatever a group has requested for and is funded, we follow up. Time to time we check their records, progress, and challenges. The ones we can offer solution within our capacity we do, beyond our capacity we refer to our higher neighbour. So, we monitor, interface with groups, visit individual's farms, and then evaluate their performance. Sometimes the intervention is not all about disbursement, you have to do a lot of planning, office work, record, proposal, send for approval, they will monitor, and assess, before approval is given. It is when the proposal is approved, contract awarded and supply made before disbursement. (Informant D, 13th September, 2025).

In terms of transparency, the facilitators sit with the group then come up with a proposal stating what they want and how much the project can offer, because you cannot go beyond what the project can offer. They work within that range; the costing is done and that tabulated. We sum up all that each of the group in that community has proposed based on their request. Then we form them into documents that is called CARP (Community Action Recovery Plan) for that community. This contains all the proposals for that community, it is then sent to state office and it will be advertised there any service provider that satisfy the condition, it will be approved. This is not about funds but items. Then if the groups within the community accepts those items base on what they want. Then a form will be filled by the community that this person/company/firm has supply us these items and we have accepted them, they are in good condition and they are what we requested in our proposal. Then we will go and approach the state office with that community approval and for reimbursement. The supplier will not be paid until the community clears him. So, you can see where the transparency comes in because if the community does not accept the items they cannot sign, and once they don't sign there will be no payment. This help in avoiding shading deals or short changing of items by the service provider. This is one of the things that has kept our programme on high level of transparency (Informant D, 13th September, 2025).

CARES programme and Poverty Reduction among Beneficiaries

This theme suggests that NG-CARES programme has had measurable positive effects on poverty reduction among beneficiaries in Plateau State. The informant states that the intervention has succeeded in reaching the poorest and most vulnerable.

The agency has been able to identify the poorest of the poor (Informant D, 13th September, 2025).

Implementation and Operational Challenges

The theme revealed significant implementation challenges, which include funding constraints, poor access roads, and insecurity. These constraints reduce coverage, delay interventions, and sometimes weaken the programme's poverty reduction outcomes. The COVID-19 affected almost everybody but the agency cannot reach everybody. In this respect, some people felt neglected. In the office there is a heap of applications that are unattended to. So, this intervention just attended to a few of a large population that needs help. The support from government is insufficient compared to the demand required by the population. Though, working with farmers is very difficult, some that did not gain the support will want to spoil the game for others. Also, there have been misuse by the farmers of the intervention. For example, some were given piglet and others chicks but did not take good care of the pigs or chicks and witness a lot of casualties especially with the chicks. Even though they were train on how to do it because we don't just give them the item, we also give them capacity to manage the item. They were not able to put them to proper use so it resulted to huge loss. This was not palatable to the agency because it desires that whatever intervention given should be properly utilized to the benefit of the people so that beneficiaries will enjoy and the agency will give report to the financiers and they will really appreciate that there is more food in circulation so that people will recover properly. In addition, some of the beneficiaries are not sincere enough to open up in certain issues. Insecurity in Plateau state is a serious challenge; there are areas because of insecurity facilitators cannot really reach. Then bad roads too, though the project has areas to cover but it cannot cover everywhere. There are communities we find it difficult to access especially at certain seasons (e.g. raining season). As you know farm lands are very far and the roads are bad (Informant D, 13th September, 2025)

Lessons Learned from Programme Implementation

Informant highlighted lessons learnt regarding programme implementation strategies. The NG-CARES programme has really brought us closer to the poor to see their plight, how they are struggling to survive, sometimes we have to reconsider our conditions to be flexible enough to attend to their needs and advise government better (Informant D, 13th September, 2025).

Sustainability and Policy Implications

The informant suggested that the NG-CARES programme be sustained and scale up. The programme is time bound, even if World Bank will withdraw her support, the State government should not relent in their support to sustain the FADAMA structure (Informant D, 13th September, 2025).

Results from Observations

The result observed in the field has helped in assessing the NG-CARES programme in Plateau State to show that the programme actually exists and beneficiaries of the interventions were actually supported as stated.

Table 6: Observation Checklist

Indicators	Items to Observe	Observed Comment / Remark
Agricultural Assets for Production and Mitigating Food Loss and Waste	Evidence of Assets received	Yes, evidence of assets received was seen, these are Processing machines, motorize sprayer, Maize Thresher and Planter, see Table 2 and Appendix A
	Asset is in good working condition	Yes, assets still exist and in good working condition.
	Sign of reduced post-harvest losses observed	This was not possible since farming is seasonal. Though, majority of beneficiaries agreed that they experienced reduction in post-harvest losses due to the intervention, see Table 4

Source: Field Survey 2025

Table 6 highlights that the Agricultural Assets for Production and Mitigating Food Loss and Waste known as DLI 2.3 coordinated by FADAMA NG-CARES, the Facilitators were contacted as directed by the office. Name and details of beneficiaries were given and contacted as well. At the time of visit in September 2025, it was already the middle period of farming where farmers are awaiting harvest time. Therefore, the visit was done in their locality and not in the farms. The beneficiaries confirm receiving assets and evidence of the assets was visible and in good working condition. The beneficiaries testified that there is a reduction of post-harvest losses.

Discussion of Findings

The NG-CARES Agricultural Assets for Production and Mitigating Food Loss and Waste (DLI 2.3), was designed to support small-scale farmers with women and youth friendly productive assets, alongside capacity-building and training on asset utilization and maintenance (Plateau State Operation Manual, 2021). The intervention adopted a group-based approach in asset distribution, consistent with the programme's cooperative framework. However, field evidence revealed that the criteria for beneficiary selection were not always clearly defined or consistently applied. Interview responses indicated that facilitators relied on a combination of applications, community engagement, and assessments of household economic conditions to identify the "poorest of the poor." This participatory but largely subjective selection process underscores the complexities of targeting vulnerable populations in post-COVID-19 contexts, where poverty incidence was widespread and difficult to stratify (Informant D, 13th September, 2025).

In Plateau State, beneficiaries received agricultural assets such as rice, maize, and tomato processing machines, maize threshers, maize planters, and motorized sprayers to enhance production capacity and reduce post-harvest losses (FADAMA, 2025). Evidence from Table 2 confirms that beneficiaries received these assets, while Tables 3 and 4 demonstrate a marked reduction in post-harvest losses following the intervention. Beneficiaries reported improved efficiency and productivity, with significantly lower levels of food loss and waste compared to the pre-intervention period. These findings highlight the transformative potential of mechanized and post-harvest technologies in strengthening agricultural value chains and improving farmers' livelihoods.

The intervention's impact is further contextualized by existing literature on food loss and waste in Nigeria. Gromko and Abdurasalova (2019) reported that approximately 86% of tomatoes in Nigeria are lost across the supply chain, from production to retail. Consistent with this observation, tomato farmers in Plateau State testified that access to processing machines significantly reduced post-harvest losses by enabling timely processing of perishable produce into paste. Prior to the intervention, a high proportion of beneficiaries reported post-harvest losses within the 46–60% range (61.54%), whereas post-intervention outcomes showed substantial improvement. These results underscore the critical role of processing and mechanization technologies in mitigating food loss and waste and enhancing income stability among smallholder farmers.

Beyond reducing post-harvest losses, the assets generated additional livelihood opportunities. Beneficiary groups used the equipment for both personal and commercial purposes, renting them to other farmers to generate income for asset maintenance and household welfare. For instance, beneficiaries reported that maize threshers could process up to fifteen bags of maize per day, compared to less than one bag when using manual methods. This dramatic increase in productivity illustrates how access to appropriate technology can significantly enhance labour efficiency, reduce losses, and expand income-generating opportunities.

Empirical evidence from hypothesis testing further validates the programme's effectiveness. The calculated t-value of 6.872 indicates a statistically significant impact of the NG-CARES Agricultural Assets intervention on poverty reduction among beneficiaries in Plateau State. This finding supports the hypothesis that access to productive assets and post-harvest technologies contributes meaningfully to improved livelihood outcomes. In line with global trends, the results also reflect the growing importance of mechanized agriculture in enhancing productivity and reducing poverty in developing economies (Cock *et al.*, 2022).

Despite these positive outcomes, the intervention faced notable constraints, particularly inadequate financing. Consistent with Gromko and Abdurasalova (2019), who identified limited access to finance as a major barrier to investments in food loss and waste reduction, programme official in an interview acknowledged that funding limitations restricted the scale and reach of the intervention. Many eligible farmers were excluded due to insufficient resources, leading to unmet demand and perceptions of exclusion among vulnerable populations (Informant D, 13th September, 2025). This highlights the need for increased public investment and sustainable financing mechanisms to expand the coverage and equity of agricultural asset interventions.

Furthermore, structural and contextual challenges such as poor road infrastructure and insecurity significantly hindered programme implementation. Poor rural roads constrained efficient transportation of farm produce to markets, while insecurity limited facilitators' access to some communities, particularly during certain seasons. These findings corroborate earlier reports identifying infrastructural deficits as major constraints to agricultural development in Plateau State (Laravel, 2021). Interview evidence further emphasized that insecurity and seasonal inaccessibility of rural areas reduced the programme's operational effectiveness (Informant D, 13th September, 2025).

From a theoretical perspective, the Sustainable Livelihoods Approach (SLA) provides a robust framework for interpreting these findings. The SLA posits that individuals and households combine financial, physical, natural, social, and human assets to construct sustainable livelihood strategies (Chambers & Conway, 1992; Morse, 2024). The NG-CARES Agricultural Assets intervention strengthened farmers' physical and human capital while indirectly enhancing financial and social assets. However, the limited scale of financial support constrained the programme's capacity to deliver broader and more inclusive livelihood outcomes. This implies that expanding access to productive assets and complementary financial support is critical for maximizing the poverty reduction potential of such interventions.

Overall, the findings indicate that the NG-CARES Agricultural Assets for Production and Mitigating Food Loss and Waste intervention significantly improved agricultural productivity, reduced post-harvest losses, and enhanced income-generating opportunities among beneficiaries. Nevertheless, its long-term poverty reduction impact was moderated by financial, infrastructural, and security constraints. These results suggest that while asset-based agricultural interventions are effective pathways to poverty reduction, their sustainability depends on adequate funding, infrastructural development, and integrated rural development strategies.

Conclusion and Recommendations

The NG-CARES agricultural assets for production and mitigating food loss and waste increased the living standard of beneficiaries from 2.19 to 2.85 having the mean difference of 0.65 ($p = 0.000$), which shows that it is statistically significant at 5% level of significance. In conclusion, analysis has shown that the NG-CARES intervention that promote agriculture through mechanized farming tend to be most impactful in enhancing the living standard and household welfare of beneficiaries, and have the capacity to reduce poverty among beneficiaries in Plateau State.

Based on the data presented and analysed and hypotheses tested the study recommends that:

- i. Increase government and donor funding to provide more agricultural assets and financial resources to small-scale farmers, including those yet to benefit in the NG-CARES Agricultural Assets for Production and Mitigating Food Loss and Waste component, to expand programme reach and ensure equitable access.
- ii. Invest in rural road networks and transportation infrastructure to facilitate timely delivery of agricultural inputs, improve market access for produce, and enhance the effectiveness of mechanized farming interventions.
- iii. Enhance training and technical support for beneficiaries on the use and maintenance of agricultural assets, and implement robust monitoring, transparency, and accountability frameworks to ensure proper utilization and sustainability of resources.

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APPENDIX A

SAMPLE OF THE NG-CARES AGRICULTURAL ASSETS FOR PRODUCTION AND MITIGATING FOOD LOSS AND WASTE



Maize Planter donated by FADAMA NG-CARES to Beneficiaries to encourage maize planting in large hectare of land



Motorize Sprayer donated by FADAMA NG-CARES to beneficiaries to promote mechanize farming



Maize Processing Machine donated by FADAMA NG-CARES to Beneficiaries to promote efficiency in farming



Tomatoes Processing Machine donated by FADAMA NG-CARES as Asset to Beneficiaries to reduce food loss and waste



Maize Thresher donated by FADAMA NG-CARES as Asset to Beneficiaries to encourage mechanized farming, productivity, reduce food loss and waste and poverty reduction