Agricultural Mechanization as a Driver of Food Security: Insights from Benue and Niger States, Nigeria

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Abstract

Agriculture mechanisation continues to remain within the realm of imagination of larger population of Nigeria farmers, despite huge budgetary outlays on mechanisation, machinery, financial disbursement, and trainings. The failure of attaining agriculture mechanisation amidst food insecurity calls for academic concern. This study engaged Resouce Based Theory to investigate agricultural mechanization as a driver of food security with insights from Benue and Niger States, Nigeria. The study adopts survey research design. The population of the study; Benue and Niger states totals 12,924,600 and this being a large and finite population, hence this study employed scientific sampling technique determination of Krejcie and Morgan (1970) to arrive at a sample size of 384. The study utilized primary data source elicited from a structured five Likert scale questionnaire. While descriptive statistics was used to check the influence of Agricultural mechanization as a driver of food security: Insights from Benue and Niger States, Nigeria. Findings from this study revealed that agriculture mechanisation is outside the reach of most farmers whose productivity is still connected with drudgery, sheer labour, and largely classified as small placeholder farmers. Findings from the study also establish that mechanisation strategies as seen by government and her agencies has not yet established direct link to the real farming communities for training, sensitisation, financial disbursement, and equipment distribution. Based on these findings, the study recommends that Benue and Niger States government should get farming communities buy-in on agriculture mechanisation, which could lead to community ownership.

Keywords: Agricultural Mechanisation, Food Security, Niger State, Benue State.

Introduction

The relationship between agriculture mechanisation and food security could be seen from the giants' strides of developed economies who have successfully adopted agricultural mechanization, leveraging advanced technologies, machinery, and equipment to streamline agricultural processes and overcome labour constraints. Advanced economies have also taken agriculture mechanization into the realm of precision farming, also known as precision agriculture (PA), which has gained significant traction around the world due to its potential to enhance agricultural productivity, reduce costs, optimize resource utilization, and minimize environmental impact (Petrović, et al., 2024), GPS-guided machinery, variable-rate application systems, and remote sensing for crop monitoring in the US (Baarbé et al., 2019).

Agricultural mechanization is the replacement of human and animal labour by mechanical devices in farming activities as it embraces the manufacture, distribution and operation of all types of tools, implements, machines and equipment for agricultural land development, farm production and crop harvesting, and primary processing (Simalenga, 2020). The overdependence on subsistence agriculture has led to sluggish development in urban areas and skewed income distribution (Davies, 2019). Interestingly, the United Nations Food and Agriculture Organization (FAO) and the United Nations Industrial Development Organization (UNIDO) shared a common ground that the goal of agricultural mechanization is to reduce

labour. Increasing productivity by updating executive operations in order to gain more power, increasing the level of cultivated land, moving toward industrialization and strengthening the market for rural economic growth and ultimately improving the livelihoods of farmers are the goals of mechanization (Emami et al., 2018).

However, in Africa, agricultural mechanization face numerous challenges that have hindered its widespread adoption and impact on food security. Limited access to appropriate and affordable machinery, inadequate infrastructure, inadequate and politicised policies fraught with leakages, dearth of institutional frameworks, and a lack of skills and training in modern agricultural practices are among the key challenges (Kassamba et al., 2024). These factors have contributed to low productivity, high post-harvest losses, and limited food availability in many African countries, including Nigeria. Understanding these challenges is crucial for designing effective interventions and policies that can address specific needs and constraints of the African context.

Agriculture remains the backbone of Nigeria's economy, providing livelihoods for a significant portion of the population and serving as a critical source of food for the nation. According to the National Bureau of Statistics (2017), Nigeria has 69.09million gainfully employed persons, of which 45.47 million are self-employed and working in the agriculture sector (Statista, 2023). However, the sector faces comprehensive challenges of insecurity, climate change, dearth of mechanisation and supportive infrastructures that hinder the sector's ability to contribute effectively to food security. Among these challenges are the dearth of training and skill development initiatives to support mechanised farming, inadequate and unclear government policies and supportive institutions, lack of infrastructural development, and conspicuous absence of mechanization and sustainable technology transfer, which collectively impede the optimal integration of agricultural mechanization and jeopardize the nation's food security.

Interestingly, the United Nations Food and Agriculture Organization (FAO) and the United Nations Industrial Development Organization (UNIDO) shared a common ground that the goal of agricultural mechanization is to reduce labour. Increasing productivity by updating executive operations in order to gain more power, increasing the level of cultivated land, moving toward industrialization and strengthening the market for rural economic growth and ultimately improving the livelihoods of farmers are the goals of mechanization (Emami et al., 2018). The majority of Nigerian farmers continue to rely on traditional, labour-intensive farming methods, contributing to inefficiencies, low productivity, and limited output under the aggravating effects of climate change. The absence of widespread mechanization and the transfer of sustainable technologies hinder the sector's ability to harness modern tools and practices crucial for enhancing productivity and ensuring food security (Daum et al., 2021).

In Nigeria, federal government efforts as seen in the 2024 budget which allocated N134.54 billion to agricultural sector representing 1.32 percent of the total budget of N27.5 trillion which is minimally higher than 2023 allocation. The inadequate budgetary allocation to Nigeria's agriculture could be counteractive to issues of 500,000 dry farming hectares mechanisation, rehabilitation of irrigation facilities and dams, storage, and research and development, thereby negatively impacting farmers' productivity and food security. Government-initiated policies, such as the Anchor Borrowers Program (ABP), National Agricultural Technology and Innovation Plan (NATIP), aim to diversify the economy away from oil are always fraught with poor implementation or hijacked by political cronies (Ojabello, 2023).

The choice of Benue and Niger states as the domain of study is not only informed by the location of both States in the North central geopolitical zones but by the preparedness of both States for agriculture mechanisation as seen through; Benue State Bureau of Agricultural

Development and Mechanisation, which provides agricultural inputs to farmers across the twenty-three Local Government Areas of the state, a marching order of the State Government that all Local Government executives as well as key ministries and parastatal of government to come up with sustainable models and methods of ensuring that Benue State remains and practically retains its title as the 'food basket of the nation'. In Niger State, the State has a Food Security and Agricultural Mechanization Programme which took delivery of 1000 tractor facilities from John Deer Group, in tranches of 2,000 units per annum for the next five years.

Differences between Agric Mechanisation and Mechanisation strategies

Aspect	Agricultural Mechanization	Agricultural Mechanization Strategies
Focus	Use of machinery and equipment for farming operations.	Planning and implementation of systems to promote mechanization.
Nature	Practical and operational (what is done).	Strategic and managerial (how it is promoted).
Purpose	Directly increases efficiency and productivity in farming.	Guides and supports the adoption and sustainability of mechanization.
Examples	Using tractors, irrigation pumps, and harvesters.	Policies for subsidies, training programs, and access models.
Implementation Level	Field-level operational changes.	Policy and program-level initiatives.

Source: Research Work Compilation, 2024

Integrated Pest Management

Integrated Pest Management (IPM) is an effective and environmentally sensitive approach to pest management that relies on a combination of common-sense practices. IPM programs use current, comprehensive information on the life cycles of pests and their interaction with the environment. IPM approach can be applied to both agricultural and non-agricultural settings, such as the home, garden, and workplace. IPM takes advantage of all appropriate pest management options including, but not limited to, the judicious use of pesticides (United State Environmental Protection Agency, 2023).

Infrastructure Development on Agricultural Mechanization
Infrastructure development in the context of agricultural mechanization refers to the construction, improvement, and maintenance of physical structures and facilities that support mechanized agricultural activities. These infrastructure investments aim to enhance the efficiency, productivity, and sustainability of agricultural production by providing the necessary support systems for mechanized farming practices. Peng et al. (2020) found that agricultural mechanization can improve the level of comprehensive agricultural development by optimizing the agricultural planting structure. Tang et al. (2018) found that the use of agricultural machinery can reduce agricultural production losses, thereby reduce agricultural production costs and promote the high-quality agricultural development.
Farmers and ranchers depend on reliable infrastructure to deliver their products and expand their operations. Agricultural infrastructure has the potential to transform the existing traditional agriculture or subsistence farming into a most modern, commercial and dynamic farming

system. It is a critical sector in terms of economic growth and development and sustainable food production. It includes water resources (irrigation), land development, agricultural roads and other transportation infrastructure, agricultural equipment, machinery and information systems, building infrastructure (greenhouses, warehouses, small industries connected with agricultural production, silos, tanks), energy production for/from agriculture, institutional infrastructure (agricultural research, extension & education technology, information and communication services, financial services, marketing, etc.), agricultural waste management systems.

Agricultural Mechanization Strategies

Agricultural mechanization strategies are the planned approaches or frameworks designed to promote, implement, and manage agricultural mechanization in a sustainable and effective manner. These strategies consider factors such as resource availability, local needs, policy support, and environmental impact. Agricultural mechanization strategies purposefully the adoption and efficient utilization of mechanized tools and systems, ensure equitable access to mechanization for smallholder farmers, and align mechanization with broader agricultural and economic development goals. Examples of Agricultural Mechanization Strategies Developing subsidy programs to make machinery affordable for farmers, establishing training centers for machine operators and maintenance personnel, and Promoting public-private partnerships to provide access to mechanized services.

Mechanization Support Services: This is a deliberate mechanization strategy provisioning of support services, including equipment maintenance and repair facilities, spare parts supply chains and training centers, are essential for ensuring the proper functioning and longevity of agricultural machinery. Access to reliable and affordable mechanization support services encourages farmers to invest in mechanized farming technologies and facilitates the adoption of sustainable mechanization practices.

Training and skill Development: Nigeria is reputed to have the highest agricultural research system in Africa though, but Nigeria is still beset with lack of adequate public investment in agriculture, lack of well-trained researchers, inadequate research infrastructures and poor management of the agricultural research. The development systems are some of the constraints to utilisation of agricultural research results. There are over 16 agricultural research institutions spread across the length and breadth of Nigeria operating at their lowest capacity as a result of lack of funding. Worrisome is the neglect of research institutions all over the country, due to paucity of fund most cannot fulfill the purposes of their existence. Particular attention should be given to the research systems Research in Nigeria is not necessarily its funding but the incentive given to the researchers and utilising their findings (Ekugbe, 2023).

Food Security

Food security according to Food and Agricultural Organisation (FAO) (2011) exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for active and healthy life. Thus, to achieve food security in Nigeria is a task that requires a holistic approach in terms of commitment, knowledge and skills acquisition by all categories of individuals especially the youths at all levels of education. Food security is usually framed in four dimensions food availability, access to food, food use, utilization and food stability (FAO, 2016a). This study will conceptualise food security to exclude livestock management but include all efforts to fortify institutions and policies to end hunger through availability and affordability of food all year round.

Overview of the Tinubu Administration's Strategies and Food Security in Nigeria

The introduction of food stamp as a way of subsidy for the relatively poor is an affirmation to the renaming of the Ministry of Agriculture to Ministry of Agriculture and Food Security. Hence the government in no doubt came aboard securitizing food as a security issues (Ogbonnaya, 2023). The establishment of Ministry of Livestock Development to among other deliverables, reduce the decades-long gory conflict between farmers and nomadic cattle herders nationwide (Lasisi &Igwe, 2024). The 500hectare cultivation of land particularly targeting ungoverned space, is an issue that connects agriculture to security issues (Utse, 2023). The positioning of storage silos across the Local Government Areas is an effort to capture agricultural wastes which could facilitate government ability to steer the country away from food price instability and untimately food insecurity (Sanni, 2024).

The mechanization strategies of the administration could be seen from the relocation of the National Agricultural Land Development Agency (NALDA) to the Federal Ministry of Agriculture and Food Security as suggested by the Oronsaiye reports (Nyong, 2024), signed memorandum of agreement with the Brazilian Government and German Deutsch Bank Group as financiers of a 995 million euros for the Green Imperative Programme which to provide mechanization hubs across the 774 local government areas in Nigeria when implemented (Utse, 2023). The deployment of 774 Silos across all LGAs, a memorandum of understanding between the federal government and the John Deer Group, to deliver 10,000 units of tractors and implement in tranches of 2,000 units per annum for the next five years (State House, 2024).

The Renewed Hope Initiative as a pet project, added bites to food security as RHI sets out to cater for Nigerian women, youths and children. The initiative focuses on five key areas – agriculture, education, economic empowerment, health and social-investment. "Beneficiaries will register with the Corporate Affairs Commission and open a bank account to qualify to be considered. The RHI sources of funds leveraged on the unspent funds from the APC 2023 campaign purse, funds from private organisations, international donors, and Non-Governmental Organisations (Oyewole, 2023).

Empirical Review

Agriculture mechanization and Food Security

Olasehinde-Williams et al. (2020) in a sub regional study interrogated the role of agricultural mechanization as a pathway to achieving sustainable food security in Sub-Saharan Africa. The study employed Generalized Method of Moments to analyse elicited data, spanning over 17 years from twenty-five Sub-Saharan countries Empirical results from System. Results from the study established that among other variables, mechanization is a significant factor influencing agricultural productivity. Study concluded that dearth of investment in mechanisation constrained higher agricultural productivity hence Africa imperatively need larger investments in mechanization. The study was a regional study hence the need for states specific study which this study capture.

Haider and Joshy (2024) investigated effect of farm mechanization on Indian agriculture with respect to rice yield. The study engaged time series data and a simple regression model between on the independent and dependent variables. Result emanating from the study showed that there is a strong relationship between rice yield and the sale of tractors while consumption of fertilizers is not significant on rice yield. The study submitted that there is a need for policy recommendation to provide farm machinery by applying the principle of public distribution

system in India to tractor distribution system to those farmers who cannot afford it due to lack of money. The study was done in India and there is the need to avoid error of generalization hence this study interrogate links between government policies on mechanization and the public distributive system in Nigeria.

Peng, et al. (2022) studied the impact of agricultural mechanization on agricultural production, income, and mechanism in Hubei province, China. The study employed quantitative research design by utilizing a sample-modified endogenous merging model and a threshold effect model. Result from the study submitted that the level of mechanization has a significant positive impact on the cost, output value, income and return rate of all types of crops. To improve understanding of the high-quality development of agriculture in China, the factors limiting agricultural income and the impact of the level of agricultural mechanization on agricultural production and income and its mechanism were analysed.

Issaka et al. (2022) reviewed nexus between food security, poverty alleviation and Ghana's profitability of agricultural mechanization services. The study employed content analysis and existing relevant literature to achieve the objectives of the research. The findings of the study emphasize that, agricultural mechanization is a panacea to food security and poverty alleviation in emerging country such as Ghana. According to the study the most crucial factors which positively determined the use of tractors were household size, access to extension services and crop production. The factors which negatively affected the use of machinery in agriculture were education, land area cultivated and stoniness. This study on effect of farm mechanization on Indian agriculture with respect to rice yield was done in Indi, hence the need for state specific study in Benue and Niger States.

Strategies of Agriculture mechanization and Food Security
Elbashi (2024) investigated agricultural mechanization and food security in Saudi Arabia to enhance productivity and improve the management of crops, livestock, aquaculture, and forestry for better working environments, increased income, reduced labor-intensive work, and the creation of new rural business opportunities. Result from the study posited that practicing of precision agriculture which include collection of data such as soil, crop and yield data, then processing them through computer models for the generation of prescription maps and finally precise application of the agricultural inputs through variable rate application devices installed in the agricultural implements for a "water stressed" country like Saudi Arabia.

Ntagu et al. (2022) analysed agricultural mechanization as strategy for food security in Nigeria. The study engaged descriptive method of analysis of data elicited from secondary archival search. Results that emanated from the study established a nexus between lack of availability of agricultural mechanization strategy and food insecurity, as famer lacks requisite skills, high tariff in machine spare part and the poverty of the rural people who hardly can buy a costly machine individually. The study though relevant did not link up government policies to the very communities that are populated with agrarian farmers.

Emami et al. (2018) interrogated agricultural mechanization as a strategy formulating on food food security for Iran. The study engaged qualitative research design with reliance on observation and extant literature to identify the weaknesses, strengths, threats and opportunities (SWOT) facing Iran's agricultural development to achieve the main objective of the research. The findings from the study submitted that the production or import of agricultural machinery and modern technologies, according to their suitability with the country's conditions and future needs; along with strengthening of the supply chain and maintenance services were among

strategies prioritized by the study. The goal of the strategies, with the help of appropriate technologies, is to lead to a sustainable agricultural development and, ultimately, food security. Adeola and Ikpesu (2016) quantitatively interrogated the impact of bank lending on agricultural output in Nigeria. The study applied a VAR (Vector Autoregressive) approach over the period 1981-2013. The empirical findings of the VAR result show that there is no cointegration among the variables of AGO and CLA. The results also indicate that both CLA positively affect agricultural output in Nigeria but the effect of CLA as shown by the variance decomposition is very low. Hence, it is expedient for the government and monetary authorities to design policies that will encourage banks to create an enabling environment by making more funds available to the agricultural sector as this will increase the level of agricultural output in the country and contribute to increased economic growth.

Theoretical Framework

Resource-Based Theory

Resource Based-View (RBV) is a theory that underlies the combining firm's resources to achieve a competitive advantage (Barney & Hesterly, 2015). Barney (1991) prominently developed the RBV shape by defining the resource characteristics of competitive advantage. while Teece et al. (1997) introduced dynamic capabilities based on RBV ideas to increase competitive advantage. RBV experiences evolvement until today, called resource-based theory (RBT). Resource-based theory focuses on the strategic management of resources within an organization or system. In the context of agricultural mechanization, challenges may arise from the unequal distribution of resources, including access to credit, technology, and support services, which can affect the success of mechanized farming practices.

The focus of RBT elaborates on the resources that have the characteristics of valuable, rare, inimitable, and non-substitutable (VRIN), which will bring the firm to win the competition (Barney, 1991), revisited by Barney and Wright (1998) to become valuable, rare, inimitable, and exploited by an organization (VRIO). Directors require these characteristics to determine the resources that support a bank's strategy. When formulating a strategy, an agro nased companies must consider the resource' features, the technology to leverage upon along the agriculture value chain that will be exploited and combined. Hence, the firm must have the micro-foundations of dynamic capability: to sense opportunities through constantly scanning, searching, and exploring the resources; seize the opportunities through resource investment decisions and allocation to increase return advantage and leverage bundle resources to create the product and services; and transform resources and capabilities configuration to create a competitive advantage for the product or services (Ristyawan et al., 2023).

Research Methodology

This study adopted survey research design and was carried out majorly in Benue and Niger States, particularly in headquarters of various agencies and organised private sectors driving agricultural mechanization in Benue and Niger States, Nigeria. These agencies are purposively chosen to form the sampled size population of this study, because of their influence on agricultural mechanization from farm implements, machination, fertilizers inputs, financial lending, and trainings. Such agencies are Federal Ministry of Agriculture, Federal ministry of science and technology, the Nigeria Incentive-Based Risk Sharing System for Agricultural Lending (NIRSAL), Farmers Association of Nigeria, Research Institutions, mechanised farmers, Agro equipment rental agencies, lending institutions, Donor agencies and NGOs, environmental agencies, farmers, herders, and community leaders amongst others.

Visitations to agencies influencing agricultural mechanization shall also be explored to elicit compelling data, such institutions include but not limited to National Centre for Agricultural Mechanization (NCAM) Ilorin, Ministry of Science and Technology, Agricultural driven research institutions, Agriculture Research Council of Nigeria (ARCN), Centre for the Promotion of Private Enterprises (CPPE), NGOs, and Civil Society Organizations in the field of agricultural mechanization. The population of this study; Benue and Niger States totals 12,924,600 (National Population Commission, 2022) which is large and as the entire population was not studied. This study employed scientific sampling technique determination of Krejcie and Morgan (1970) that recommends a sample size of 384 for a population of 1 million.

This study engaged survey research design with the administration of structured questionnaires instruments to elicit information within Minna and Otukpo across visited farms, while data analysis and presentation of findings carried out using statistical software which includes SPSS.

Reliability and Validity Test
Reliability of the primary data is checked through Cronbach's alpha. Reliability of the survey instrument is evaluated through Cronbach Alpha. The study computes separate and combine reliability estimates, which are similar to the normally used coefficient alpha statistics. Cronbach value beyond (α = .7) signifies acceptable reliability.

Table A: Cronbach's Alpha Test Results Summary

Variable	Cronbach Alpha	Number of Items
Food Security in Benue and Niger States (FSCBN)	0.868	7
Agric Mechanisation in Benue and Niger States (AGMEC)	0.894	7
Agric Mechanisation Strategy in Benue and Niger States (AMSBN)	0.941	7
Total Questions	0.910	21

Source: Extracted from SPSS Output, 2024

The measurement scales' computed Cronbach's Alpha (α) results in Table A on Food Security in Benue and Niger States (FSCBN) revealed Cronbach's Alpha (α) of 0.868, while questions on Agric Mechanisation in Benue and Niger States (AGMEC) showed Cronbach's Alpha value of 0.894, and Agric Mechanisation Strategy in Benue and Niger States (AMSBN) revealed Cronbach's Alpha (α) of 0.941. The overall questions translated to a Cronbach Alpha (α) of 0.910. The measurement scales were reliable as all the Cronbach's value are well above 0.6 threshold which is the recommended coefficient for a given research instrument.

Data Analysis and Results
Table B: Responses Frequency on Agriculture Mechanisation in Benue and Niger States

	SA= Strongly Agree (5); A= Agree (4); NA= Neutral (3); SD= Strongly Disagree (2); D= Disagree (1)								
		SA	A	N	D	SD	StdDev	Mean	Total
1	Mechanization has reduced amount of time required for planting of my crops.	45	56	2	137	144	0.7065	3.5469	384
		0.117	0.146	0.005	0.357	0.375			1
2	Agricultural mechanization has improved my access to food throughout the year.	49	62	3	150	120	0.7402	3.7458	384
		0.128	0.161	0.008	0.391	0.313			1
3	Use of machines has decreased post-harvest losses in my production.	26	41	2	198	117	0.6677	3.8842	384
		0.068	0.107	0.005	0.516	0.305			1
4	Income from farming has increased	65	47	5	148	119	0.4851	3.3099	384

		SA	A	N	D	SD	StdDev	Mean	Total
	due to the use of mechanization practices.	0.169	0.122	0.013	0.385	0.310			1
5	Mechanization has made food accessible for the local population.	52	49	6	151	126	0.8353	3.7177	384
		0.135	0.128	0.016	0.393	0.328			1
6	Reliance on mechanisation has negatively affects community employment in farming.	57	45	3	170	109	0.7906	3.8123	384
		0.148	0.117	0.008	0.443	0.284			1
7	Access to machinery has improved farming practices	38	32	2	190	122	0.7065	3.5469	384
		0.099	0.083	0.005	0.495	0.318			1

Source: Field Survey, 2024

To analyse influence of agricultural mechanization in Benue and Niger States in Table B, this study focused on the percentage distribution of responses and the Mean and Standard Deviation. These metrics help the study to understand the overall perception of mechanization and its variability across the respondents. On assertion Mechanization has reduced the amount of time required for planting crops. The majority disagreed at 73% that mechanization reduced planting time, showing a perception that mechanization level in practice in Benue and Niger state may not be reducing the time effectively in practice.

On if Agricultural mechanization has improved access to food throughout the year. Respondents showed slightly higher disagreement of 72% that mechanization improves food access. This suggests some benefits, but access issues remain significant. Also a notable 82% of respondents disagree to indicate that mechanization has not consistently reduced post-harvest losses for many farmers. On the poser that mechanization has made food accessible for the local population, responses affirmed in disagreement which suggests challenges in translating mechanization benefits to food accessibility.

On the reliance on mechanization has negatively affected community employment in farming. High agreement (44.3% Disagree, 28.4% Strongly Disagree) indicates that mechanization is perceived to reduce community-level employment, likely due to replacing labor-intensive practices. On access to machinery improving farming practices, a significant number of respondents disagreed (49.5% Disagree, 31.8% Strongly Disagree), showing that access to machinery may still be limited or unevenly distributed.

While mechanization holds promise for improving agricultural productivity, significant challenges related to accessibility, equity, and implementation must be addressed to optimize its impact in Benue and Niger States.The mean values provided offer insights into the strong disposition and awareness that there is presence of mechanisation but accessibility and the practices are way beyond farmers, with a mean value well above 2.5 indicating a positive outlook. The findings highlight necessity for policy on Mechanisation to have a widespread impact on farmers with enrich local content.

Table C: Responses Frequency on Agriculture Mechanisation Strategy in Benue and Niger States

SA= Strongly Agree (5); A= Agree (4); NA= Neutral (3); SD= Strongly Disagree (2); D= Disagree (1)									
	The adoption of agricultural machinery has significantly improved my farming productivity.	SA	A	N	D	SD	StdDev	Mean	Total
1		30	20	2	189	143	0.3456	2.0346	384
		0.078	0.052	0.005	0.492	0.372			1
2	I have adequate access to modern	45	32	3	182	122	0.4125	2.2143	384

	agricultural equipment that enhances my farming practices.	0.117	0.083	0.008	0.474	0.318			1
3	Financial investment in mechanization has led to noticeable yield	2	2	1	198	181	0.6677	3.4543	384
		0.005	0.005	0.003	0.516	0.471			1
4	There are training programmes for local fabricators to assist mechanisatio	65	47	5	148	119	0.7851	3.4223	384
		0.169	0.122	0.013	0.385	0.310			1
5	Government dominance through ministries has a crowding out effect on private investors in agricultural practice	43	39	2	146	154	0.8353	3.5144	384
		0.112	0.102	0.005	0.380	0.401			1
6	Implementation of mechanized farming practices has increased the availability of food in my community.	21	38	1	170	154	0.7832	3.3456	384
		0.055	0.099	0.003	0.443	0.401			1
7	most machinery tools companies have folded up in Nigeria	11	37	2	199	135	0.7065	3.5469	384
		0.029	0.096	0.005	0.518	0.352			1

Source: Field Survey, 2024

That the adoption of agricultural machinery has significantly improved farming productivity, elicited majority of respondents to disagreed 86% and this statement, indicate dissatisfaction with the adoption of machinery in improving productivity. Same expression was visited on the poser that there exist adequate access to modern agricultural equipment that enhances farming practices, as seen 79% respondents negative disposition to such assertion. This was taken further as 98% respondents affirmed in the negative that financial investment in mechanization has led to noticeable yield. Another indicator that validates the absence of mechanization strategy could be seen where only 29% agreed that there are training programs for local fabricators to assist mechanization programs and over 71% in disagreement.

300 out of total 384 respondents shared common ground that government dominance through ministries has a crowding-out effect on private investors in agricultural practice and this hinder private sector participation in agricultural mechanization. 324 respondents also disagreed that iimplementations of mechanized farming practices has increased the availability of food in their community. While the decline of machinery tools manufacturing companies in Nigeria, was largely affirmed by 334 respondents and this signifies poor readiness by government in whatever strategies put in place.

Discussion of Findings
Quantitative expression gotten from this study translate that agriculture mechanisation is widely outside the reach of most farmers whose productivity is still connected with drudgery and sheer labour. The process of assessing mechanisation is outside the economic bracket of most farmers who are still largely classified as small placeholder farmers. This finding is in line with prior works of Olasehinde-Williams et al. (2020); Haider and Joshy (2024); Peng, et al. (2022); Issaka et al. (2022)

The result that emanated from the survey study establish the fact that mechanisation strategies as seen by government and her agencies has not yet established direct link to the real farming communities and of which same link can be used to facilitate training, sensitisation, financial disbursement, and equipment distribution. This study aligns with similar findings of Elbashi (2024); Ntagu et al. (2022); Emami et al. (2018); Adeola and Ikpesu (2016)

Conclusions

In conclusion, the data elicited from responses underscores the critical importance of agriculture mechanization and agriculture mechanization strategies in both Northcentral States of Benue and Niger State. The study also conclude that the absence of these of community ownership of State government mechanization efforts, despite huge investment in tractorisation by the Niger State government whose delivery of over 1000 tractors.

Recommendations

Arising from the findings of this study, the following recommendations are put forward:

i. That the Benue and Niger States government should get buy in from the farming communities that could lead to community ownership of agriculture mechanisation. Such ownership will magnetise local fabricators, mechanics and other stakeholders as against the normal standalone mechanisation arrangement of government agencies and political cronies.

ii. The study recommends that Benue State and Niger State government should establish community-led committees for a "pay-per-use" or "community hiring service" model for agricultural machinery operated by local groups. Same channels will also largely serve as a true channel for training, funding, and this will finally promote Public-Private Partnerships (PPPs) in Agriculture for food security.

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