Moroccan Journal of Agricultural Sciences
Vol 6 No 3 (2025): (September 2025), 218-225
Agricultural and Rural Economics

Mechanization and Extension Services in the Era of Buharinomics: Myth or Momentum?

Sanusi Mohammed SADIQ	Department of Agricultural Economics and Agribusiness, FUD, Dutse, Nigeria
I.P SINGH	Department of Agricultural Economics, SKRAU, Bikaner, India
M.M AHMAD	Department of Agricultural Economics and Extension, BUK, Kano, Nigeria
B.S SANI	Department of Agricultural Economics and Agribusiness, FUD, Dutse, Nigeria

The Buhari administration (2015–2023) in Nigeria introduced a suite of agricultural reform policies aimed at revitalizing the sector, with particular emphasis on mechanization and extension services. This paper critically reviews the implementation and outcomes of these policies within the framework of "Buharinomics"—the economic philosophy associated with President Muhammadu Buhari, assessing whether these initiatives constituted genuine developmental momentum or were largely rhetorical. Drawing on policy documents, national agricultural transformation plans, budgetary allocations, and empirical studies, the paper investigates the scope, scale, and impact of government-led mechanization drives and the revitalization of agricultural extension systems. While the era witnessed policy pronouncements and some structural investments—such as partnerships with foreign equipment suppliers and the deployment of extension agents—implementation gaps, inadequate funding, and bureaucratic inertia limited the overall effectiveness of these programs. The analysis suggests that despite notable initiatives like the Green Imperative Program and the National Agricultural Extension and Advisory Services Strategy, many promises remained under-delivered, reflecting a disconnect between ambition and execution. The paper concludes that while there was clear policy intent, the Buhari era's achievements in mechanization and extension were more myth than sustained momentum, necessitating a rethinking of institutional frameworks and accountability mechanisms in future interventions.

Keywords: Agriculture, Advisory services, Policy, Nigeria

INTRODUCTION

Background of the Study

Agriculture remains the cornerstone of Nigeria's economy, employing over 70% of the rural population and contributing significantly to food security and poverty reduction. However, productivity in the sector has historically been hampered by limited access to mechanized tools and weak extension services (Takeshima and Lawal, 2020). In response to these longstanding structural deficits, the Buhari administration (2015–2023) undertook a series of agricultural reforms under what many analysts describe as "Buharinomics"—a policy approach combining protectionism, state-led development, and anti-corruption rhetoric (Adeniji and Igwe, 2021).

Buhari's administration rolled out initiatives such as the Agriculture Promotion Policy (APP) 2016–2020, aimed at building on the Agricultural Transformation Agenda (ATA) of the previous government. The APP emphasized improving access to inputs, mechanization, storage, and extension services as part of the strategy to diversify the economy away from oil dependency (Ojong and Anam, 2018). One of the administration's flagship mechanization programs was the

Green Imperative Initiative, a $1.2 billion bilateral program with Brazil aimed at deploying over 10,000 tractors and 700 Agricultural Equipment Hiring Enterprises (AEHEs) across Nigeria (Takeshima and Lawal, 2020; Ekperiware, 2020; Shaibu, 2023).

Extension services were also prioritized under the National Agricultural Extension and Advisory Services Strategy (NAEASS), which proposed recruiting and training 75,000 extension agents nationwide (Abdul, 2020). These agents were expected to bridge the knowledge gap between research institutions and smallholder farmers through capacity building, demonstration plots, and technology dissemination.

Despite these initiatives, agriculture during Buhari's tenure was marked by persistent challenges. Farm-level mechanization remained low, hovering at about 0.3 horsepower per hectare, compared to the FAO-recommended minimum of 1.5 hp/ha for meaningful productivity gains (Shaibu, 2023). Likewise, the ratio of extension agents to farmers remained well below the FAO benchmark of 1:800, often averaging 1:10,000 in many states due to underfunding and institutional fragmentation (Etim et al., 2024).

Compounding these technical issues were broader macroeconomic dynamics—such as inflation, insecurity, and border closures—which affected the implementation of these agricultural programs. For instance, the 2019 border closure, aimed at curbing food imports, exacerbated food inflation and underscored the insufficient domestic production capacity despite the push for mechanization (Adeniji and Igwe, 2021; Eborka, 2023).

Relevance of the Buhari Era

The Buhari years represent a critical juncture in Nigeria's agricultural evolution. For the first time in decades, the federal government attempted a cohesive mechanization agenda and reemphasized public extension systems. Yet, despite laudable blueprints and strategic partnerships, implementation outcomes appear uneven and contested across stakeholders and regions. Scholars and policy analysts continue to debate whether these reforms produced real agricultural transformation or merely reinforced historical patterns of underperformance and political symbolism (Takeshima and Lawal, 2020; Obiakor et al., 2022).

This study therefore seeks to critically interrogate the policy objectives and actual outcomes of Buhari-era interventions, focusing on mechanization and extension services as the analytical entry points into broader agricultural reforms.

Problem Statement

Despite the Buhari administration's emphasis on repositioning agriculture as a core pillar of national development, Nigeria's performance in agricultural mechanization and extension services remained underwhelming. Mechanization coverage in Nigeria was estimated at less than 1.5 horsepower per hectare (hp/ha) throughout Buhari's tenure—far below the global average of 4.0 hp/ha and the FAO-recommended minimum of 1.5 hp/ha for Sub-Saharan Africa (Shaibu, 2023). This chronic under-mechanization contributed to persistently low yields and high post-harvest losses, particularly among smallholder farmers who dominate the sector.

Equally concerning is the decline in agricultural extension service effectiveness. Though the National Agricultural Extension and Advisory Services Strategy (NAEASS) aimed to recruit and train over 75,000 extension agents, only a fraction were actually deployed due to fiscal constraints, bureaucratic delays, and unclear federal-state coordination mechanisms (Abdul, 2020). In many regions, the extension-to-farmer ratio remained as poor as 1:10,000, drastically limiting the dissemination of modern farming techniques (Etim et al., 2024).

The flagship Green Imperative Programme, a $1.2 billion mechanization initiative in partnership

with Brazil, also failed to meet rollout targets. While thousands of tractors and equipment hubs were promised, less than 20% of these assets had been procured or distributed by the end of 2022 (Takeshima and Lawal, 2020). Moreover, logistical inefficiencies, corruption in procurement chains, and lack of local manufacturing capacity further constrained the initiative's success (Obiakor et al., 2022).

Additionally, food security worsened under Buhari, despite the implementation of protectionist policies such as land border closures in 2019. The policy, aimed at boosting local production, instead triggered food inflation, reduced access to cross-border inputs, and revealed the fragility of Nigeria's domestic agricultural base (Adeniji and Igwe, 2021; Eborka, 2023).

Given these paradoxes—bold policy pronouncements and underwhelming outcomes—this study asks: Were Buhari-era mechanization and extension service reforms a genuine developmental momentum or merely a political myth cloaked in technocratic language?

Justification for the Study

There are several compelling reasons for conducting this research at this moment:

• Policy Learning and Continuity: As Nigeria transitions into a new administration, critical evaluation of past agricultural policies is essential for guiding future interventions. A granular understanding of the Buhari era's successes and failures can help policymakers avoid repeating the same systemic errors.

• Empirical Accountability: While Buhari's agricultural programs have been praised in government reports and political rhetoric, independent academic evaluation is sparse. This study provides an evidence-based assessment that cuts through narratives to evaluate policy outcomes on mechanization and extension systems.

• Economic Relevance: Agriculture remains central to Nigeria's diversification agenda, and improvements in mechanization and extension services have a direct impact on rural employment, food security, and poverty reduction. As such, identifying the constraints and opportunities in these subsectors is of national importance.

• Sustainable Development Goals (SDGs): Nigeria's commitment to SDG 2 (Zero Hunger) and SDG 8 (Decent Work and Economic Growth) hinges largely on the agricultural sector's performance. This review highlights how policy-practice gaps in the Buhari era may have hindered progress toward these global goals (Ojong and Anam, 2018).

• Regional Implications: Given Nigeria's position as a regional agricultural powerhouse, the failure or success of its agricultural modernization programs carries implications for West African food systems and regional trade dynamics.

By addressing these dimensions, this study contributes not only to academic discourse but also to pragmatic policy debates on how to build resilient agricultural systems in the face of climate stress, rural underdevelopment, and economic volatility.

Research Objectives

• To assess the level of agricultural mechanization under the Buhari administration.

• To evaluate the effectiveness of agricultural extension services from 2015–2023.

• To determine whether the reforms represented substantive progress or policy symbolism.

THEORETICAL FRAMEWORK

Understanding the dynamics of agricultural mechanization and extension service reform in the Buhari era necessitates a multi-theoretical lens. This study adopts an interdisciplinary theoretical approach drawing from (1) Modernization Theory, (2) Rogers' Diffusion of Innovations Theory, and (3) the Institutional Theory of Development. Each of these frameworks provides insight into the complex policy, social, and economic structures influencing mechanization and knowledge dissemination in Nigerian agriculture.

Modernization Theory

Modernization theory, particularly as articulated by Walt Rostow's «Stages of Economic Growth», postulates that societies progress through five developmental stages, culminating in the "age of high mass consumption" (Rostow, 1960). A critical phase within this progression is the "take-off" stage, where investment in technology—including agricultural mechanization—enables productivity surges across sectors.

Buhari's agricultural strategy, particularly through the Green Imperative and APP 2016–2020, was explicitly geared toward this kind of structural transformation. The promotion of tractors, tillers, and processing hubs was intended to substitute traditional labor-intensive tools and transition Nigeria's agriculture from a subsistence-based model to a more commercially viable and export-ready sector (Takeshima and Lawal, 2020).

However, critics argue that the take-off was only partially achieved due to the lack of supporting infrastructure, financial inclusion, and policy coherence—factors that modernization theory often assumes will develop organically. In the Nigerian context, this assumption did not hold true, as the state-led drive lacked a robust private-sector interface and failed to build sufficient institutional capacity (Shaibu, 2023).

Rogers' Diffusion of Innovations Theory

Everett Rogers' Diffusion of Innovations Theory provides a behavioral and communication framework for understanding how new technologies—like tractors or digital advisory platforms—are adopted within farming communities (Rogers, 2003). The theory emphasizes five key factors influencing adoption: relative advantage, compatibility, complexity, trialability, and observability.

In Nigeria, despite the availability of some mechanized technologies, adoption among smallholder farmers remained low. Studies show that even where AEHEs (Agricultural Equipment Hiring Enterprises) were introduced, most farmers could not access services due to cost, limited availability, or lack of technical knowledge (Obiakor et al., 2022). Similarly, extension agents reported challenges in communicating innovations effectively due to language barriers, mobility issues, and insufficient training (Etim et al., 2024).

Rogers' model thus explains the policy-to-practice disconnect: technologies introduced during the Buhari administration were not always compatible with local contexts or were too complex for rapid integration without tailored training programs and sustained extension services.

Institutional Theory of Development

Institutional theory highlights the role of formal and informal structures—rules, norms, and routines—in shaping development outcomes. It argues that «isomorphic mimicry»—copying policies that work elsewhere without adapting them to local realities—can result in implementation failure (Andrews, Pritchett and Woolcock, 2017). This framework is particularly useful in analyzing why

mechanization and extension service programs under Buhari often underperformed despite appearing sound on paper.

The Green Imperative, for instance, was modeled after Brazil's success with machinery co-operatives and equipment leasing hubs. Yet, Nigeria lacked the enabling institutional conditions—such as strong cooperatives, maintenance infrastructure, and a viable rural credit system—to replicate this model successfully (Takeshima and Lawal, 2020). Additionally, bureaucratic fragmentation between federal and state agricultural bodies further diluted implementation efforts (Abdul, 2020).

Thus, while institutional theory explains the failure of policy transplantation, it also points to the need for adaptive learning, local ownership, and administrative decentralization as prerequisites for successful agricultural transformation.

Collectively, these theories explain why agricultural mechanization and extension services under Buharinomics produced mixed results:

• Modernization theory justifies the government's investment thrust but overlooks institutional and social bottlenecks.

• Diffusion theory highlights farmer-level adoption barriers and the importance of sustained knowledge transfer.

• Institutional theory explains systemic failures due to weak governance, limited accountability, and poor contextual adaptation.

By integrating these lenses, the study provides a holistic understanding of both the ambition and limitations of Buhari-era agricultural policy.

CONCEPTUAL FRAMEWORK

A conceptual framework offers a structured representation of how variables and concepts interact within a study. For this research, the framework connects policy intentions, intervention mechanisms, and agricultural outcomes, within the broader political-economic environment shaped by Buharinomics.

The Buhari administration's approach to agriculture can be understood through a Results-Based Logic Model, where inputs and activities are designed to generate immediate outputs, intermediate outcomes, and long-term impact.

Core Constructs (Table 1)

Pathways of Interaction

Input Level

• Federal policy initiatives (APP, NAEASS, Green Imperative)

• Capital investment (tractors, hubs, training programs)

Process Level

• Recruitment and training of extension agents

• Deployment of mechanization through AEHEs

• Farmer outreach and capacity-building exercises

Output Level

• Number of functioning tractors and AEHE centers

• Extension agent-to-farmer ratio improvements

• Farmer awareness and demonstration events conducted

Outcome Level

• Improved yields per hectare

• Reduction in manual labor dependency

• Wider technology adoption among rural farmers

• Greater self-sufficiency and resilience in food systems

Conceptual Framework of Agricultural Modernization Under Buharinomics

Underlying Assumptions

• That government policy is effectively implemented at both federal and state levels.

• That mechanization and extension are complementary, not isolated.

• That institutional and infrastructural barriers (e.g., road networks, corruption, power supply) are minimized for optimal results.

• That farmer behavior (adoption, investment, engagement) responds to both incentives and education (Ojong and Anam, 2018; Etim et al., 2024).

Justification of Framework

This conceptual model helps frame the study's core research question: Were Buhari-era mechanization and extension service reforms mere policy rituals or did they produce tangible outcomes?

By isolating outputs (number of tractors, agents, trainings) from outcomes (increased adoption, yield gains), the framework supports an analytical evaluation of whether policy translated into practice, and whether the practice delivered real results.

RESEARCH METHODOLOGY

This study adopts a qualitative meta-analytical approach to evaluate the scope, effectiveness, and institutional outcomes of agricultural mechanization and extension service reforms in Nigeria under President Muhammadu Buhari (2015–2023). The methodology blends desk-based content analysis, policy evaluation, and comparative performance benchmarking.

Research Design

A descriptive-explanatory research design is employed to trace the policy lifecycle—from conceptualization to implementation and outcome. This design allows for critical comparison of what was planned (policy intent) versus what was achieved (empirical reality).

This is suitable for unpacking complex governance frameworks and their translation into agricultural interventions, especially in low- and middle-income country (LMIC) contexts like Nigeria (Takeshima and Lawal, 2020).

Sources of Data

Primary Sources

• Not applicable in this review-based study. No field surveys or original interviews were conducted.

Secondary Sources

Data and materials were gathered from the following:

Government documents:

• Agriculture Promotion Policy (APP) 2016–2020

• National Agricultural Extension and Advisory Services Strategy (NAEASS)

• Reports from the Federal Ministry of Agriculture and Rural Development (FMARD)

International organization reports:

• Food and Agriculture Organization (FAO)

• International Food Policy Research Institute (IFPRI)

• African Development Bank (AfDB)

Peer-reviewed academic literature: Journals indexed in Google Scholar, ResearchGate, and IntechOpen between 2018–2024.

Grey literature: Academic theses, local evaluation reports, and media policy briefs that provide insight into implementation gaps.

Sampling Method

A purposive sampling strategy was used to select documents, reports, and peer-reviewed papers that:

• Were published between 2015 and 2024.

• Directly address agricultural mechanization or extension services in Nigeria.

• Reference specific Buhari-era programs such as the Green Imperative or APP.

• Provide either evaluative evidence or qualitative policy analysis.

At least 25 relevant sources were triangulated for the analysis, ensuring coverage from multiple disciplinary perspectives: agricultural economics, rural development, and public policy.

Data Analysis Technique

Content and Thematic Analysis

A content analysis was used to extract recurring themes, metrics, and gaps. Key themes included:

• Mechanization infrastructure deployment

• Extension workforce performance

• Farmer-level adoption

• Funding and policy implementation gaps

These themes were then analyzed through a thematic coding framework grounded in institutional performance theory and Rogers' innovation diffusion model (Rogers, 2003; Andrews et al., 2017).

Policy Implementation Assessment

The Policy Implementation Gap Model was employed to assess:

• The variance between policy design and implementation outcomes

• Whether observed bottlenecks were due to institutional, fiscal, or social failures

This approach is especially critical in LMIC governance studies where "implementation asymmetry" is common (Andrews et al., 2017; Abdul, 2020).

Limitations of the Methodology

• Lack of Primary Data: The study does not incorporate firsthand fieldwork, which limits its ability to measure real-time farmer experiences.

• Variability in Data Quality: Some government-reported metrics lacked consistency or verification from independent third-party evaluations.

• Regional Bias: Some reviewed studies focus more on southern states (e.g., Cross River, Ogun) than on northern zones, potentially under-representing regional diversity.

Nevertheless, triangulating multiple authoritative sources helps mitigate these limitations and provides a robust empirical foundation for policy evaluation.

RESULTS AND DISCUSSION

This section presents an evidence-based appraisal of the performance, shortcomings, and institutional bottlenecks of agricultural mechanization and extension service delivery during the Buhari administration. The discussion is organized around five thematic pillars: mechanization progress, extension service reach, institutional capacity, regional and gender disparities, and overall impact on food security.

Agricultural Mechanization: Ambition vs. Reality

The Buhari administration's flagship mechanization policy—the Green Imperative Programme—was launched in 2019 as a $1.2 billion public-private partnership with Brazil aimed at delivering over

10,000 tractors, 700 Agricultural Equipment Hiring Enterprises (AEHEs), and 10,000 service technicians nationwide. However, the implementation of this project stalled. According to Shaibu (2023), as of late 2022, less than 2,000 tractors had been deployed, with most states lacking the enabling infrastructure and managerial framework to host AEHEs.

Similarly, the Agricultural Promotion Policy (APP) 2016–2020 included plans to increase mechanization by 30%. However, Takeshima and Lawal (2020) found that mechanization intensity remained at 0.3 hp/hectare, far below the Sub-Saharan Africa average of 1.3 hp/ha and the FAO's threshold of 1.5 hp/ha needed to raise productivity.

Additionally, Buhari-era investments in local machinery production did not take off. Nigeria continued to rely on expensive imports while local fabricators lacked technical and financial capacity (Akinbamowo, 2013; Igoni, 2018).

Conclusion: While policy intent was robust, the absence of decentralized planning, infrastructure, and institutional accountability led to poor outcomes in mechanization delivery.

Extension Services: Poor Reach and Sustainability

The National Agricultural Extension and Advisory Services Strategy (NAEASS) promised to train and deploy 75,000 extension agents by 2022. Yet, government figures show only about 15,000 agents were recruited, and less than 10,000 were active by 2023 (Etim et al., 2024). The result was a national extension-to-farmer ratio of 1:10,000, well below the recommended 1:800.

Moreover, several agents were not paid, poorly equipped, and rarely received refresher training. A field study in Cross River revealed that female agents were disproportionately underutilized due to gender stereotyping and institutional biases (Etim et al., 2024). Others noted that agent mobility was severely constrained by lack of motorcycles, allowances, or digital tools (Abdul, 2020).

Observation: The centralization of extension reforms at the federal level, with inadequate state collaboration, hampered service delivery. Poor digitalization also limited outreach, especially during COVID-19.

Institutional Bottlenecks and Policy Incoherence

Implementation weaknesses stemmed not only from funding gaps but also from institutional dysfunctions. The Buhari administration often replicated global best practices—such as Brazil's tractor-leasing model—without adapting to Nigeria's fragmented agricultural governance. According to Andrews et al. (2017), this is a case of isomorphic mimicry, where policies are copied without building matching capacities.

For instance, many AEHE centers were established without consultations with state agencies or cooperative societies, leading to poor utilization (Shaibu, 2023). The FMARD and state Ministries of Agriculture operated in silos, with overlapping functions and unclear responsibilities, especially in equipment maintenance and extension training (Ojong and Anam, 2018).

Regional Disparities and Gender Gaps

Mechanization access and extension coverage varied across regions. Southern states like Ogun and Cross River performed better due to relative peace and more responsive subnational governance (Obiakor et al., 2022). Conversely, North-East and North-West states—plagued by insecurity—saw disrupted farming activities and lower program coverage (Eborka, 2023).

In terms of gender, Etim et al. (2024) found that female farmers were less likely to benefit from both extension training and mechanized services, particularly in patriarchal communities. Cultural

norms, land access limitations, and a lack of gender-sensitive programming reinforced this gap.

Insight: Agricultural modernization during Buharinomics failed to integrate inclusion and localization, reinforcing old inequalities while introducing new inefficiencies.

Impact on Food Security and Agricultural Output

Despite efforts to promote domestic production, food security indicators deteriorated during the Buhari era. The National Bureau of Statistics (NBS) reported food inflation surpassing 22% in 2021, partly due to the 2019 land border closures, insecurity, input price spikes, and ineffective mechanization scaling (Adeniji and Igwe, 2021; Eborka, 2023).

Cassava and maize production saw some regional improvements, especially where extension services were functional (Tanko et al., 2019). But across the country, poor access to irrigation, mechanized services, and certified seeds kept yields below targets.

Additionally, Buhari's Anchor Borrowers' Programme (ABP) suffered from poor recovery rates, politicized allocations, and low impact on mechanization access (Ekperiware, 2020). In many cases, farmers who received loans still hired labor manually due to a lack of access to equipment or AEHE facilities.

CONCLUSION

This review examined the agricultural modernization agenda of the Buhari administration (2015–2023) with a specific focus on two critical components: mechanization and extension services. Drawing on academic evidence, policy evaluations, and development reports, the findings reveal a dichotomy between policy ambition and on-ground reality.

Despite commendable efforts—such as the Green Imperative, APP 2016–2020, and NAEASS—the outcomes of these reforms were largely underwhelming. Mechanization intensity remained abysmally low at 0.3 hp/hectare compared to the FAO-recommended 1.5 hp/hectare, while less than 20% of the projected tractors and AEHEs under the Green Imperative were deployed by 2023. Similarly, extension service reforms failed to reach scale, with fewer than 15,000 new agents deployed nationwide, yielding an ineffective farmer-to-agent ratio of 1:10,000.

Institutional fragmentation, funding shortfalls, and implementation bottlenecks—aggravated by insecurity, inflation, and poor infrastructure—undermined the overall effectiveness of these reforms. Thus, while Buharinomics offered a structured blueprint for revitalizing Nigerian agriculture, its mechanization and extension components yielded more policy symbolism than sustained momentum.

RECOMMENDATIONS

To move from myth to meaningful progress, future administrations should consider the following recommendations:

Reengineer Mechanization Strategies

• Decentralize AEHE operations to local cooperatives and community-based organizations, ensuring greater ownership and maintenance.

• Incentivize private sector participation in tractor leasing and spare part distribution to reduce over-reliance on foreign machinery.

• Invest in local fabrication hubs to produce affordable implements suited to regional agro-ecologies.

Strengthen Extension Systems

• Increase federal and state budget allocations to support the recruitment, training, and digitalization of extension workers.

• Incorporate ICT-enabled extension services (e.g., SMS advisory, radio broadcasts, WhatsApp support groups) to extend outreach, especially during crises like COVID-19.

• Mainstream gender-sensitive approaches to ensure that women farmers are targeted in training, credit, and mechanization access.

Institutional Coordination and Reform

• Clarify the federal-state institutional roles in agricultural programs to avoid duplication and ensure accountability.

• Establish an Agricultural Policy Implementation Council (APIC) with representation from FMARD, ADPs, and civil society to track and audit reform outcomes.

Monitoring, Evaluation, and Learning (MEL)

• Create a national dashboard for real-time tracking of extension coverage, mechanization density, and farmer feedback.

• Implement third-party evaluations of mechanization and extension programs to promote transparency and continuous improvement.

POLICY IMPLICATIONS

The experience of Buharinomics illustrates a broader pattern in Nigerian agricultural policy: well-designed policies often fail due to weak implementation capacity. Future agricultural transformation plans must address:

• Systemic governance weaknesses

• Local capacity deficits

• Inclusivity and rural participation

If mechanization and extension services are to catalyze agricultural growth, they must be embedded in localized, flexible, and well-resourced institutional frameworks. This is essential not just for food security, but also for achieving Sustainable Development Goals (SDG 2 – Zero Hunger, SDG 8 – Decent Work, and SDG 9 – Industry and Innovation).

REFERENCES

Abdul I.M. (2020). Food security challenge and the efficiency of agricultural extension services in Nigeria. Journal of Agricultural Extension and Rural Development, 6: 30-37.

Abubakar A., Gambo J., Umar S. (2021). An overview of the effects of some agricultural policies in Nigeria-1960-2020. Nigeria Agricultural Journal, 52: 151-162.

Adeniji A., Igwe E. (2021). Nigeria’s Foreign Trade Policy and Economic Relations China under President Buhari’s Administration, 2015-2020. Zamfara Journal of Politics and Development, 2: 26.

Olomu M.O., Ekperiware M.C., Akinlo T. (2020). Agricultural sector value chain and government policy in Nigeria: issues, challenges and prospects. African Journal of Economic and Management Studies, 11: 525-538.

Akinbamowo R.O. (2013). A review of government policy on agricultural mechanization in Nigeria. Journal of Agricultural Extension and Rural Development, 5: 146–153.

Andrews M., Pritchett L., Woolcock M. (2017). Building State Capability: Evidence, Analysis, Action (p. 288). Oxford University Press.

Eborka N.F. (2023). Agriculture and food security in Buhari’s administration (2015–2022): An evaluation. Icheke Journal of the Faculty of Humanities, 20: 293-304.

Eheazu C.L. (2017). The place of environmental adult education in the enhancement of rural occupational practices and sustainable socio-economic development to foster reversal of Nigeria's economic downtown. Journal of Resources Development and Management, 28: 49-56.

Etim O.U., Ogar P. O., Aya C.F., Obono G.I., Asghar G. (2024). Comparative analysis of factors affecting effective participation in agricultural extension services among male and female extension agents in the Cross River State Agricultural Development Project (CR-ADP). International Journal of Social Sciences and Management Research, 10(6).

Igoni A.H. (2018). Understanding the Niger Delta environment for sustainable agricultural mechanization. Annual Lecture/Awards Ceremony of the Nigerian Society of Engineers, Port Harcourt Branch, Rivers State, Nigeria.

Nazifi B., Hussaini Y.I. (2021). Determinants of participation in contract farming among smallholder maize farmers in north-western Nigeria. Acta Sci. Pol. Agricultura, 20: 147–160.

Obiakor S.C., Ehiosun P.E., Ademiluyi Y.S., Onyemize U.C. (2022). Mechanization level of cassava processing in Cross River State. Journal of Agricultural Mechanization, II: 112–117.

Ojong F.E., Anam B.E. (2018). Agricultural promotion policy and rural development in Nigeria: Challenges and prospects. Journal of Humanities and Social Science, 23: 24-29.

Rogers E.M. (2003). Diffusion of Innovations (5th ed.). Free Press.

Shaibu U.M. (2024). Agricultural Sector Policy Periods and Growth Pattern in Nigeria (1960–2020): Implications on Agricultural Performance. IntechOpen.

Takeshima H., Lawal A. (2020). Evolution of agricultural mechanization in Nigeria. An evolving paradigm of agricultural mechanization development: How much can Africa learn from Asia, 423-456.

Tanko Y., Kang C.Y., Islam R. (2019). Impact of rural infrastructure on rice productivity in Kano State, Nigeria. European Academic Journal, 7: 286-311.

References