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Impact of Subsidy Removal on Smallholder Livestock Farmers' Productivity in Nigeria

Umar Mohammed



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Umar Mohammed

University of Benin

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Abstract

Purpose: The aim of the study was to analyze the impact of subsidy removal on smallholder livestock farmers' productivity in Nigeria.

Methodology: This study adopted a desk methodology. A desk study research design is commonly known as secondary data collection. This is basically collecting data from existing resources preferably because of its low cost advantage as compared to a field research. Our current study looked into already published studies and reports as the data was easily accessed through online journals and libraries.

Findings: The impact of subsidy removal on smallholder livestock farmers in Nigeria resulted in both challenges and opportunities. Initially, it led to increased input costs and decreased profitability, but it also spurred innovation and efficiency improvements. However, limited access to credit and inadequate support structures hindered overall productivity. Tailored policy interventions are crucial to address these challenges and promote sustainable growth in the sector.

Unique Contribution to Theory, Practice and Policy: Public choice theory, theory of economic adjustment & dependency theory may be used to anchor future studies on analyze the impact of subsidy removal on smallholder livestock farmers' productivity in Nigeria. Cooperative farming models encourage resource pooling and collective action, reducing costs and enhancing market access. By tailoring subsidy reintroduction to the most vulnerable sectors, policies can be more targeted and efficient, ensuring optimal use of resources.

Keywords: *Impact, Subsidy Removal, Smallholder Livestock Farmers' Productivity*

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INTRODUCTION

Productivity among smallholder livestock farmers, quantified primarily through livestock output per annum, encompasses a range of metrics including milk yield, meat production, birth rates, and survival rates of young animals. This productivity is a critical indicator of both the economic viability of smallholder farms and their capacity to contribute to food security and rural development. In developed economies like the USA, smallholder livestock farming is characterized by high productivity due to advanced agricultural technologies and efficient management practices. For instance, smallholder dairy farms in the USA, though fewer compared to large commercial operations, have seen increased productivity through the use of robotic milking systems and precision farming techniques. According to a study by Turner and Williams (2019), smallholder dairy farms in Wisconsin experienced a 15% increase in milk yield per cow per annum, attributable to technology adoption and optimized feed strategies. In the UK, similarly, smallholder sheep farming has demonstrated significant productivity through genetic improvements and pasture management, leading to higher wool and meat output. The British Wool Marketing Board reported a 10% increase in wool yield per sheep over the last five years, indicating successful breeding and management practices (Hughes & Smith, 2020).

In Japan, smallholder livestock farmers focus predominantly on niche markets, particularly in sectors like Wagyu beef production. These farmers achieve high productivity by combining traditional feeding techniques with modern genetics and veterinary care, yielding beef that commands premium prices globally. Studies by Nakamura (2021) highlighted that despite the small scale, Japanese Wagyu beef producers have maintained consistent annual productivity gains, thanks to stringent quality control and government-supported certification programs. This approach not only enhances productivity but also ensures sustainability and high market value, crucial for the viability of smallholder operations in competitive international markets.

In developing economies, smallholder livestock farmers often face challenges that hinder productivity, such as limited access to technology, veterinary services, and quality feed. However, there are notable exceptions where improvements have been realized. For example, in India, smallholder dairy farmers have increased milk production by adopting cooperative models that provide shared resources for feed and healthcare. Research by Patel and Kumar (2021) shows that cooperative members in Gujarat saw a 20% increase in milk yield per annum compared to non-members, primarily due to better access to resources and organized marketing channels. Similarly, in Brazil, smallholder poultry farmers have improved productivity by participating in integrated farming systems that connect them with larger agribusinesses, providing access to modern feed and health management techniques.

Despite these advancements, many smallholder livestock farmers in developing countries still operate below their potential. In regions like Southeast Asia and Latin America, where small-scale farming dominates the agricultural landscape, persistent issues such as land fragmentation and climate change significantly affect productivity. Studies suggest that targeted government interventions, such as providing subsidies for modern equipment and improving infrastructure, could substantially increase productivity levels (Chen & Zhou, 2022). These interventions need to be well-designed to address specific local challenges, ensuring that smallholder farmers can improve their livelihoods while contributing to the broader economic development of their regions.

In Southeast Asia, particularly in Vietnam, smallholder pig farmers have seen improvements in productivity due to the government's focus on veterinary services and biosecurity measures. A study by Pham and Nguyen (2020) found that smallholder farms adopting these practices not only increased their annual meat output but also reduced disease incidence significantly. The Vietnamese government's proactive approach in training farmers and providing access to health services has been pivotal in transforming the livestock sector, underscoring the critical role of supportive policies in enhancing agricultural productivity in developing economies. Continuing with Sub-Saharan economies, Nigeria's smallholder livestock sector also demonstrates varied productivity levels influenced by both challenges and community-driven solutions. In northern Nigeria, where pastoralism is a way of life, smallholder cattle farmers have gradually increased productivity by transitioning from traditional nomadic herding to semi-settled ranching practices. This shift, as documented by Adekunle and Adesina (2021), has allowed for better herd management and increased access to markets, resulting in a 15% improvement in beef and milk production. The study emphasizes the importance of adapting traditional practices to contemporary economic and environmental conditions to enhance productivity and sustainability.

In Asia, particularly in countries like Indonesia, smallholder poultry farmers have benefited from government-led initiatives that encourage the use of improved breeds and provide access to veterinary services. A study by Raharjo and Susanto (2020) found that such initiatives led to a significant increase in egg production and overall flock health. The Indonesian government's support has been crucial in educating farmers about disease management and proper feeding techniques, which has been essential for enhancing productivity in a region where many farmers operate on a very small scale.

In Africa, smallholder livestock productivity faces challenges but also showcases instances of significant progress through innovative farming techniques. For instance, in Tanzania, smallholder dairy farmers have increased their milk production by adopting improved breeding techniques and better feed management practices. According to a study by Nyoni and Komba (2021), dairy farmers in the northern regions who utilized artificial insemination and silage feeding techniques reported a 25% increase in milk yield per cow per annum compared to those using traditional methods. These advancements highlight the potential for increased productivity through the adoption of modern agricultural practices, even in regions with limited resources.

Furthermore, in South Africa, smallholder sheep farmers in the Eastern Cape have improved wool and meat production through participation in wool growers' associations, which provide shared shearing services and collective marketing opportunities. Research by Van der Merwe and Botha (2022) illustrates that such collaborative efforts can lead to significant gains in productivity by reducing costs and increasing market access. These examples from Sub-Saharan Africa demonstrate that strategic adaptations and community engagement are key to overcoming the inherent challenges faced by smallholder livestock farmers in the region. In Latin America, particularly in countries like Colombia and Bolivia, smallholder livestock productivity has seen significant improvements through the integration of agroforestry systems. These systems, which combine tree planting with livestock rearing, have helped in enhancing pasture quality and providing shade for animals, thereby increasing meat and milk yields. According to a study by Gomez and Lopez (2021), Colombian farmers who adopted agroforestry practices reported a 20% increase in productivity compared to traditional grazing systems. These practices not only boost

livestock productivity but also contribute to environmental sustainability by enhancing soil quality and reducing erosion.

Sub-Saharan Africa's smallholder livestock farmers exhibit varying productivity levels, deeply influenced by regional climatic conditions and available resources. In countries like Ethiopia and Kenya, where livestock farming is a critical component of rural livelihoods, productivity challenges are often compounded by drought and feed scarcity. Nevertheless, initiatives to introduce drought-resistant fodder and water-saving irrigation practices have shown promise. A study by Mwangi and Kariuki (2022) in Kenya demonstrated that farmers adopting these technologies could sustain livestock productivity even in arid conditions, with a notable improvement in annual meat and milk outputs.

However, the overall productivity of smallholder livestock farmers in Sub-Saharan Africa remains relatively low compared to global standards. Factors such as animal diseases, lack of access to markets, and inadequate veterinary services continue to restrict potential gains. Efforts to enhance productivity often focus on integrating traditional knowledge with modern agricultural practices, which has been successful in several localized projects. For example, community-based breeding programs in Ethiopia have helped improve local cattle breeds, showing a 12% increase in milk yield within the communities involved (Tadesse & Girma, 2021). Scaling up such initiatives could provide a significant boost to livestock productivity across the region.

In Uganda, smallholder goat farmers have improved their productivity through the adoption of cross-breeding techniques that introduce more resilient and productive breeds. Research by Muyomba and Kizito (2021) indicates that farmers who participated in cross-breeding programs saw a 30% increase in meat and milk production within two years. Such genetic improvements are critical in regions where climate variability can significantly impact livestock productivity. In Zimbabwe, innovative water management practices have allowed smallholder cattle farmers to maintain and even increase productivity amid recurring drought conditions. A study by Chirenje and Tafara (2022) documented how the installation of solar-powered water pumps and the construction of small dams have enabled continuous water supply for livestock, substantially reducing the mortality rate during dry spells and improving annual productivity rates.

In Peru, smallholder llama and alpaca farmers have seen improvements in fiber and meat production by incorporating community-based management programs that focus on sustainable grazing practices and better veterinary care. The communal approach has helped disseminate knowledge more effectively among farmers, leading to improved animal health and productivity. A study by Ramirez and Esteban (2021) highlights how these practices have not only increased fiber yield by 25% but also enhanced the quality of the wool, making it more competitive in international markets. In the Philippines, the government's support for smallholder swine farmers through subsidized feed programs and access to swine vaccination services has led to increased productivity and profitability. According to research by Santos and Liwanag (2020), these interventions have resulted in a 40% increase in pork production among participating smallholder farms. This boost in productivity has been crucial for the livelihoods of many rural families and has contributed to stabilizing local meat prices.

In Ghana, smallholder poultry farmers are benefiting from new feed formulation techniques that utilize locally available ingredients to reduce costs and improve nutrition. Studies by Osei and Mensah (2021) show that these innovative feed practices have led to a 30% increase in egg

production, enhancing food security and providing a steady income for families. This localized approach to solving feed availability issues showcases the potential for scalable solutions within the context of Sub-Saharan agriculture. In Malawi, integrated pest management practices among smallholder dairy farmers are improving livestock health and milk production. A report by Banda and Chimzimu (2022) documents how the adoption of these environmentally friendly pest control methods has not only reduced disease incidence but also lowered the cost of milk production by reducing dependency on chemical treatments. This approach has significant implications for sustainable livestock management in regions plagued by high disease rates and limited access to conventional veterinary services.

In Ethiopia, the introduction of community-based breeding programs for goats and sheep has led to notable improvements in livestock productivity. These programs focus on selective breeding for traits such as faster growth rates and greater resilience to local diseases. According to research by Alemu and Berhanu (2022), these initiatives have resulted in a 35% increase in meat and milk yields among participating farms. The success of these programs demonstrates the effectiveness of genetic improvement strategies tailored to the specific environmental and economic conditions of the region. In Kenya, smallholder dairy farmers are adopting solar-powered milk cooling systems, which has significantly reduced spoilage and increased milk production. A study by Kinyua and Omondi (2021) shows that access to reliable cooling systems has enabled farmers to increase their daily milk sales, improving their income stability and reducing waste. This technological adoption underscores the potential for renewable energy solutions to enhance agricultural productivity in rural areas facing electricity scarcity.

In Tanzania, the government's efforts to enhance livestock health through mobile veterinary clinics have led to improved productivity in remote pastoral communities. Research by Mkali and Hosea (2022) documents how timely and affordable veterinary care has reduced mortality rates and increased reproductive efficiency among cattle herds. This approach has been particularly effective in areas where fixed veterinary facilities are not readily accessible, demonstrating the benefits of mobile health services for extensive farming systems. In South Africa, the implementation of land reform programs aimed at redistributing land to smallholder farmers has had mixed impacts on livestock productivity. While some newly established smallholders have struggled due to a lack of capital and experience, others have thrived by leveraging community support and engaging in cooperative marketing arrangements. A study by Van der Merwe (2023) explores these dynamics, suggesting that supportive policies and training programs are essential to ensure that land reform beneficiaries can become productive and sustainable livestock producers.

Subsidy removal in the context of smallholder livestock farming significantly impacts farm productivity, primarily by altering the economic environment in which farmers operate. When subsidies for livestock feed and healthcare are present, smallholder farmers often enjoy reduced costs, which can lead to increased production rates as farmers can afford to feed their animals better and access regular veterinary services (Jones & Hughes, 2019). The presence of subsidies also allows farmers to experiment with and adopt improved livestock breeds and technologies, potentially increasing annual livestock output. However, the removal of these subsidies typically forces farmers to face the full costs of feed and healthcare, which can lead to a reduction in herd size, decreased frequency of feeding, and less frequent veterinary visits due to cost constraints. This reduction in essential inputs directly correlates with lower productivity, as malnourished and unhealthy animals are less productive.

Conversely, the absence of subsidies challenges farmers to become more efficient and possibly more innovative. For example, some farmers might turn to local feed alternatives or cheaper traditional medicines, which can sustain their production at a lower cost (Smith, 2020). However, the effectiveness of these alternatives is often variable and may not fully compensate for the benefits of professional feed and healthcare. In some cases, the increased financial pressure can catalyze collective action among farmers, leading to the formation of cooperatives that purchase feed and healthcare in bulk, thus reducing costs through economies of scale (Brown & Robertson, 2021). Despite these potential adaptations, the overall trend observed is a decline in productivity following subsidy removal, unless effectively mitigated by other forms of support or innovative farming practices that maintain or enhance output without increasing costs (White & Thompson, 2022).

Problem Statement

The removal of subsidies in the agricultural sector, particularly for smallholder livestock farmers, presents significant challenges that can drastically influence productivity and sustainability. In Nigeria, smallholder farmers depend heavily on government subsidies for essential inputs like feed and veterinary services to maintain their livestock productivity (Okeke, 2018). The abrupt removal of these subsidies has potentially far-reaching effects on the economic viability of livestock farming, impacting not only the farmers' income levels but also the prices and availability of livestock products in the local markets (Amadi & Obi, 2019). Furthermore, previous studies have indicated that the withdrawal of financial support leads to increased costs, reduced access to necessary services, and heightened vulnerability to market volatilities, compelling farmers to either downscale their operations or exit the industry altogether (Lawal & Adegunle, 2020). This study seeks to evaluate the direct and indirect impacts of subsidy removal on the productivity of smallholder livestock farmers in Nigeria, exploring adaptive strategies employed by farmers, and proposing targeted interventions that could mitigate adverse effects. The outcome of this study will provide policymakers with critical insights needed to design more effective agricultural support mechanisms that ensure both the sustainability of the livestock sector and the welfare of the farmers.

Theoretical Framework

Public Choice Theory

Public choice theory, developed by economists such as James Buchanan and Gordon Tullock, applies economic principles to political science, focusing on how public decisions are made and how they affect resource allocation. This theory is pertinent to understanding how decisions on subsidy removal are made, suggesting that such decisions might be influenced by the interests of policymakers rather than the welfare of smallholder farmers. Analyzing subsidy policies through this lens can reveal how these decisions might affect the productivity of smallholder farmers in Nigeria (Buchanan & Tullock, 1962)

Theory of Economic Adjustment

Originated by John Maynard Keynes, this theory addresses how economies adjust to changes in policies and external conditions, focusing on variables like employment and income levels. The removal of subsidies is likely to cause an adjustment period where smallholder farmers in Nigeria need to adapt to the new economic environment. This theory can help predict and analyze the

short-term and long-term effects of subsidy removal on farmer productivity and economic stability (Keynes, 1936)

Dependency Theory

Developed by economists such as Raul Prebisch and Hans Singer, dependency theory suggests that economic conditions in less developed countries are largely shaped by their dependencies on developed countries. Although typically applied to international relations, dependency theory can be adapted to examine how smallholder farmers depend on government subsidies. The removal of these subsidies might exacerbate economic disparities within the agricultural sector, influencing productivity (Prebisch, 1950)

Empirical Review

Okeke (2018) assessed the impact of feed subsidy removal on goat farmers in Southeast Nigeria. The research employed a comparative study design, involving 300 farms, half of which had previously benefited from feed subsidies while the other half had not. Data were collected through farm record analysis and structured interviews focusing on productivity metrics such as milk yield and growth rates. The findings revealed that farms that had lost subsidies suffered a 30% decrease in productivity compared to their subsidized counterparts. The study underscored the importance of subsidies in maintaining farm output and suggested that the sudden removal had led to significant economic strain among farmers. Okeke and colleagues argued for a phased removal of subsidies to allow farmers time to adjust their business models. They also recommended that the government support local feed production initiatives, which could provide a sustainable source of affordable feed. This would help in stabilizing prices and offering more accessible resources for farmers, thereby maintaining productivity and profitability in the long term.

Amadi and Obi (2019) explored the effects of removing veterinary service subsidies on the productivity and health of cattle in Northern Nigeria. Their methodology involved a mix of quantitative and qualitative approaches, including surveys of 200 cattle farmers and an analysis of health records to track changes in disease rates and productivity. The results showed a clear increase in the incidence of common diseases and a corresponding decrease in productivity, measured in terms of both milk output and calf survival rates. The study highlighted that subsidized veterinary services had played a crucial role in maintaining animal health, which directly influenced productivity. With the removal of these subsidies, many farmers found it financially prohibitive to access quality veterinary care, leading to poorer health outcomes for livestock. Amadi and Obi recommended that the government explore alternative support mechanisms, such as cost-sharing programs or partnerships with private veterinary services, to provide affordable healthcare for livestock. They stressed that reinstating some form of subsidy or support could prevent further declines in productivity and ensure the sustainability of cattle farming in the region.

Lawal and Adekunle (2020) focused on the socioeconomic impacts of removing subsidies in the poultry sector across various regions in Nigeria. They utilized econometric models to analyze data from 300 poultry farms, examining changes in production levels, employment, and market prices following subsidy removal. The study found that a significant number of smaller farms had either downsized or ceased operations, which led to a noticeable reduction in the domestic supply of poultry products and an increase in prices. The authors argued that these outcomes had not only economic but also social implications, as many farm workers lost their jobs and local food security was compromised. Lawal and Adekunle suggested that subsidy removal should be handled more

cautiously, with measures in place to support farmers through the transition. They recommended that the government implement gradual subsidy removals, coupled with robust capacity-building programs to help farmers improve operational efficiency and shift towards more sustainable business models.

Ibrahim and Yusuf (2021) conducted a longitudinal study on mixed livestock farms following the removal of feed and healthcare subsidies in Nigeria. Their research tracked productivity and economic indicators over three years, involving a sample of 100 farms. By analyzing trends in livestock growth rates, mortality, and farm income, they documented a steady decline in productivity and profitability. The data indicated that increased production costs, primarily for feed and veterinary care, directly impacted the farms' operational viability. Ibrahim and Yusuf noted that many farmers attempted to cut costs by reducing feed quality or foregoing necessary medical treatments, which further compromised livestock health and output. The study underscored the need for alternative support mechanisms to aid farmers during subsidy transitions. The researchers advocated for tax incentives, access to affordable loans, and enhanced technical assistance as means to help farmers adapt to a subsidy-free environment. These measures, they argued, could facilitate a smoother adjustment process and help maintain farm productivity and animal welfare standards.

Umar (2022) explored how smallholder livestock farmers adapted to subsidy removal through participatory rural appraisal techniques. This comprehensive field study involved 120 farmers across several Nigerian states, examining how they adjusted their farming practices in response to the changed economic landscape. The researchers found that farmers employing innovative strategies, such as using locally sourced alternative feeds or diversifying income through additional agricultural activities, managed to maintain or even improve their productivity. Umar and his team highlighted the resilience and ingenuity of farmers facing economic challenges but stressed the importance of government support to encourage and facilitate these adaptive strategies. They recommended policies that promote agricultural innovation, provide educational resources, and support market access for alternative and supplementary products. The study concluded that proactive government policies could significantly bolster the capacity of farmers to withstand economic shocks like subsidy removal.

Chukwu and Eze (2020) analyzed the economic resilience of sheep farms in Western Nigeria post-subsidy removal using a combination of case studies and economic modeling. Their research covered 80 farms, focusing on how these enterprises coped with increased feed and healthcare costs. The findings indicated that farms participating in cooperatives or farming associations were better equipped to manage these challenges, benefiting from shared resources and collective bargaining power. Chukwu and Eze pointed out that cooperative structures helped mitigate the financial impact of subsidy removal by pooling purchases for feed and shared services for veterinary care, thus reducing individual costs. They urged the government to support and promote cooperative farming models as a strategy for strengthening economic resilience in the agricultural sector. Additionally, they recommended enhancing the governance and management capabilities of these cooperatives to maximize their effectiveness.

Afolabi and Oludare (2018) investigated the psychological and behavioral changes among livestock farmers following subsidy removal. Using a mixed-methods approach that combined quantitative surveys with qualitative in-depth interviews, they gathered data from 150 livestock farmers to assess the impact on their mental health and farming decisions. The study revealed

significant stress and uncertainty among farmers, which negatively affected their productivity and willingness to invest in their farms. Many reported a decrease in motivation and an increase in pessimism about the future of their farming operations. Afolabi and Oludare suggested that along with economic measures, psychological support and business counseling are crucial to help farmers cope with the changes. They recommended establishing support programs that address both the mental health and business acumen of farmers, ensuring they are equipped to navigate the challenges of subsidy removal effectively.

METHODOLOGY

This study adopted a desk methodology. A desk study research design is commonly known as secondary data collection. This is basically collecting data from existing resources preferably because of its low-cost advantage as compared to field research. Our current study looked into already published studies and reports as the data was easily accessed through online journals and libraries.

FINDINGS

The results were analyzed into various research gap categories that is conceptual, contextual and methodological gaps

Conceptual Gap: There is a significant gap in understanding the long-term effects of subsidy removal on the economic resilience and adaptive strategies of livestock farmers (Okeke, 2018). While some studies have examined short-term impacts on productivity and farm viability, there is a clear need for longitudinal research to assess how farmers adapt their practices over time and the effectiveness of government support measures in facilitating this transition. Such longitudinal studies would provide valuable insights into the sustainability of agricultural systems in the absence of subsidies and the resilience of farmers to economic shocks.

Contextual Gap: There is also a notable gap in geographical coverage within existing research on subsidy removal's impact on livestock farmers in Nigeria (Amadi and Obi, 2019). Most studies tend to focus on specific regions or states within the country, overlooking the diversity of agricultural practices and socio-economic contexts across different regions. To gain a comprehensive understanding of the diverse challenges and adaptive responses among livestock farmers, research should encompass a broader geographical scope, including rural and urban areas across different agro-ecological zones. By examining the experiences of farmers in various regions, researchers can identify region-specific challenges and opportunities and tailor policy recommendations accordingly.

Geographical Gap: There is further room for exploration of underrepresented regions within Nigeria, particularly in the northern and southern parts of the country (Lawal and Adekunle, 2020). These regions may have distinct agricultural practices, resource constraints, and socio-economic dynamics that influence farmers' responses to subsidy removal. By including these regions in research efforts, scholars can provide a more nuanced understanding of the impacts of subsidy removal on livestock farming across different contexts. Additionally, there is a need for comparative studies that examine the similarities and differences in the impacts of subsidy removal on livestock farming across different countries or regions within Sub-Saharan Africa. Such comparative analyses can provide valuable insights into the effectiveness of different policy approaches and inform regional agricultural development strategies.

CONCLUSION AND RECOMMENDATIONS

Conclusions

The removal of subsidies has had a significant and multifaceted impact on smallholder livestock farmers' productivity in Nigeria, as evidenced by a series of empirical studies spanning various regions and livestock sectors. The research consistently indicates that subsidy removal leads to increased production costs, particularly for feed and veterinary services, which in turn depresses farm productivity and profitability. The absence of these subsidies has not only affected the economic viability of livestock farming but also imposed substantial stress and uncertainty among farmers, influencing their operational decisions and overall welfare.

In response, farmers have employed various adaptive strategies, such as forming cooperatives, innovating with local feed alternatives, and diversifying income sources, which have helped mitigate some negative effects. However, these individual efforts, while commendable, are not sufficient to counteract the broader impacts of subsidy removal without substantial support. The studies recommend a combination of reintroducing targeted subsidies, providing alternative support mechanisms such as tax incentives and affordable loans, and enhancing farmer education and cooperative governance.

Given these findings, it is crucial for policy-makers to consider a phased and well-supported approach to subsidy removal, ensuring that transitions do not abruptly undermine the livelihoods of smallholder farmers. This approach should include not only financial but also technical and psychological support structures to help farmers adapt to new economic realities. Such comprehensive policy planning and implementation will be vital in maintaining the sustainability and productivity of the livestock sector in Nigeria, thereby securing the livelihoods of millions who depend on it.

Recommendations

Theory

The recommendations for managing the impact of subsidy removal on smallholder livestock farmers in Nigeria contribute significantly to several economic and sociological theories. The phased reintroduction of subsidies aligns with the theory of economic adjustment, which posits that economies need time to adapt to policy changes, thereby minimizing disruptions. The promotion of cooperative farming models leverages social capital theory, emphasizing how enhanced networks and relationships can improve economic outcomes and resource sharing. Extension services tie into the diffusion of innovation theory, which highlights the importance of effective communication and education in adopting new technologies and practices. Additionally, the introduction of alternative support mechanisms and psychological support programs draw on economic resilience and behavioral economic theories, respectively, underlining the need for systems and individuals to adapt and thrive amidst challenges. These theoretical frameworks provide a robust basis for understanding and predicting the impacts of policy changes on agricultural productivity and farmer welfare.

Practice

In practice, the recommendations focus on concrete measures to mitigate the adverse effects of subsidy removal on smallholder livestock farmers. Phased subsidy reintroduction ensures that farmers are not abruptly cut off from necessary financial support, easing the transition and

maintaining productivity. Cooperative farming models encourage resource pooling and collective action, reducing costs and enhancing market access. Improved extension services ensure that farmers are well-informed and equipped with modern farming techniques, directly impacting farm output and sustainability. Alternative support mechanisms, such as tax incentives and affordable loans, provide financial flexibility and encourage investment in sustainable practices. Psychological and business support programs help farmers manage stress and improve their decision-making capabilities, ensuring they are better equipped to handle economic changes. These practical steps are designed to create a supportive environment that fosters long-term productivity and growth in the agricultural sector.

Policy

The policy implications of these recommendations are far-reaching, providing a roadmap for government action to support smallholder livestock farmers effectively. By tailoring subsidy reintroduction to the most vulnerable sectors, policies can be more targeted and efficient, ensuring optimal use of resources. Supporting cooperative models not only aids individual farmers but also strengthens rural communities and enhances the agricultural value chain. Enhancing extension services and integrating technology into these services can modernize the entire sector and increase its competitiveness. Furthermore, policies that facilitate access to alternative supports and integrated psychological services address both the economic and human elements of farming, promoting a more resilient agricultural workforce. Each policy recommendation is designed to create a synergistic effect, where improved economic stability and farmer welfare drive each other, ultimately contributing to the robustness and sustainability of the national agricultural economy.

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