

Deforestation in Akoko Edo Local Government Area, Edo State, Nigeria: Impact, Drivers, and Mitigation Strategies

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Abstract: Deforestation in Akoko Edo Local Government Area (LGA) of Edo State, Nigeria, is a growing environmental concern due to its negative impacts on biodiversity, ecosystem services, and the livelihoods of local communities. Akoko Edo is home to rich forest resources that are being rapidly depleted due to a combination of agricultural expansion, illegal logging, and the unsustainable use of forest products. This study explores the drivers, impacts, and potential solutions to deforestation in Akoko Edo, focusing on the role of climate change, unsustainable agricultural practices, and poor policy enforcement. Primary and secondary data were collected through surveys, interviews with stakeholders, and review of relevant documents. The study identifies key challenges and offers policy recommendations for forest conservation and sustainable land use practices in Akoko Edo LGA. The findings emphasize the need for stronger regulatory frameworks, public awareness campaigns, and community engagement in forest management to mitigate deforestation and promote environmental sustainability in the region.

Keywords: *Deforestation, Agriculture, Biodiversity, Climate Change, Land Degradation.*

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I. INTRODUCTION

Deforestation remains one of the most pressing environmental challenges in Nigeria, particularly in the southern ecological zones, where forest loss has reached critical levels. The country's forest ecosystems are being rapidly depleted due to a confluence of anthropogenic pressures including exponential population growth, extensive agricultural encroachment, infrastructural development, and unregulated exploitation of forest resources through illegal logging and fuelwood harvesting (FAO, 2018). These pressures have led to severe land cover change, fragmentation of natural habitats, and disruption of vital ecosystem services. Forests in Nigeria serve as carbon sinks, water regulators, and biodiversity reservoirs, and they are integral to climate regulation, erosion control, and the socio-economic resilience of forest-dependent communities (Ojo & Adebayo, 2020).

Akoko Edo Local Government Area (LGA), situated in the northern part of Edo State, exemplifies the critical deforestation dynamics occurring within Nigeria's forest-savanna transition zone. The region is characterized by ecologically significant high forest formations interspersed with derived savanna mosaics, supporting a wide range of endemic and threatened species. However, intensified anthropogenic activities such as slash-and-burn agriculture, unsustainable logging, artisanal mining, and infrastructural expansion have accelerated forest degradation and biodiversity loss in the area (Adetunji et al., 2021). Compounded by ineffective land governance, weak enforcement of environmental regulations, and limited community participation in forest management, these drivers have undermined conservation efforts.

The socio-ecological importance of Akoko Edo's forests cannot be overstated. They underpin local livelihoods by providing timber, fuelwood, medicinal plants, and non-timber forest products (NTFPs), while also contributing significantly to regional microclimatic stability and global carbon sequestration efforts (Nwoke et al., 2019). Therefore, understanding the spatial and temporal patterns of deforestation, identifying its proximate and underlying drivers, and developing adaptive mitigation strategies are critical for sustainable landscape management and biodiversity conservation in Akoko Edo and similar forest-dependent regions.

This study seeks to provide a comprehensive assessment of deforestation in Akoko Edo LGA by evaluating its ecological and socio-economic impacts, diagnosing the principal drivers, and proposing integrative mitigation frameworks aimed at fostering sustainable forest governance.

II. LITERATURE REVIEW

Deforestation is a global issue, and its impacts are particularly severe in developing countries like Nigeria. Studies reveal that Nigeria experiences one of the highest rates of forest loss in the world due to agricultural expansion, timber extraction, and inadequate enforcement of forestry laws (FAO, 2018). The southern regions, including Edo State, are especially vulnerable due to their rich forest resources and high population densities (Bamidele & Falade, 2018).

In Akoko Edo, the reliance on forests for livelihoods is significant. Local communities depend on forested areas for agricultural land, firewood, and timber, often leading to unsustainable exploitation (Nwoke *et al.*, 2019). According to Ojo and Adebayo (2020), these pressures are compounded by weak governance structures, lack of awareness about sustainable practices, and insufficient policy enforcement.

The consequences of deforestation are multidimensional, affecting environmental, economic, and social systems. Biodiversity loss, climate variability, soil degradation, and disruption of local weather patterns are major environmental impacts documented by researchers like Ibrahim and Garba (2020). Socially, indigenous communities face diminished access to forest resources, exacerbating poverty and conflicts over land use (Adetunji et al., 2021).

Existing literature identifies potential mitigation strategies, including agroforestry, reforestation, and participatory forest management. Aiyelaja and Ajewole (2006) emphasize the importance of involving local communities in forest conservation efforts, while Oladele and Omowumi (2021) highlight the role of policy reforms in addressing deforestation.

III. STUDY AREA: AKOKO EDO LOCAL GOVERNMENT AREA:

Akoko Edo LGA, located in the northern part of Edo State, is a region characterized by its rich biodiversity and dense forests (Omokaro & Eguavoen, 2017). It shares boundaries with Owan East LGA and Kogi State. Predominantly rural, Akoko Edo's economy relies heavily on agriculture, with cassava, yams, maize, and palm oil being the main crops cultivated in the area (Salami & Adetunji, 2019).

The region's tropical wet and dry climate supports a variety of flora and fauna, making it a hub of ecological significance. However, this favorable climate, combined with fertile soils, has attracted large-scale agricultural activities, often at the expense of forest cover (Ekundayo & Jegede, 2020). Rapid population growth, urbanization, and the expansion of farmland have further strained the region's forest resources (Jibrin & Hassan, 2021).

IV. METHODOLOGY

The research adopts a descriptive design, utilizing both qualitative and quantitative approaches to provide a comprehensive understanding of deforestation in Akoko Edo. Primary data were collected through structured surveys and interviews with stakeholders, including farmers, community leaders, government officials, and environmental NGOs. These interactions focused on identifying the key drivers of deforestation, its socio-economic impacts, and community awareness about conservation practices.

Secondary data were sourced from government reports, environmental impact assessments (EIAs), and academic studies on deforestation trends in Nigeria. Quantitative data were analyzed using descriptive statistics, while qualitative data were subjected to thematic analysis to extract insights into stakeholder perceptions and attitudes.

V. DRIVERS OF DEFORESTATION IN AKOKO EDO

The primary drivers of deforestation in Akoko Edo LGA are:

- **Agricultural Expansion:** As the population grows, there is an increasing demand for farmland. Forested areas are cleared for crops such as cassava, yams, maize, and palm oil plantations. Agricultural expansion, especially in areas with fertile soils, leads to the conversion of forests into agricultural land, thereby contributing to significant deforestation (Adeyemi & Dada, 2020; Adekunle & Olagoke, 2008).
- **Illegal Logging and Timber Harvesting:** The illegal logging of valuable timber species is a major concern in Akoko Edo, with both local and external actors involved in unsustainable extraction practices. This illegal activity

continues to deplete the region's forest resources (Bamidele & Falade, 2018; Akinola & Salawu, 2021).

- **Firewood Collection:** The collection of firewood for domestic use and commercial sale is a significant contributor to deforestation in the region. In rural communities, where access to alternative sources of energy is limited, firewood remains a major fuel source, leading to forest degradation (Bamidele & Falade, 2018).
- **Urbanization:** Increasing development pressures have resulted in the conversion of forest land to residential and industrial uses. Urban sprawl and infrastructure expansion into forested areas have exacerbated the loss of forests, particularly as demand for land grows with population increase (Omokaro & Eguavoen, 2017; Akpan & Udoh, 2019).
- **Climate Change:** Changing rainfall patterns and the increasing frequency of droughts exacerbate the challenges of forest management and conservation in the region. The impact of these environmental changes makes it harder for forests to regenerate, while also reducing the effectiveness of existing conservation measures (Salami & Adetunji, 2019; IPCC, 2019).

VI. IMPACTS OF DEFORESTATION IN AKOKO EDO

The consequences of deforestation in Akoko Edo are far-reaching:

- **Loss of Biodiversity:** The clearing of forests for agricultural and urban development threatens the survival of endemic plant and animal species, resulting in the loss of biodiversity. The diminishing of forest ecosystems has a profound effect on local wildlife, which rely on these forests for habitat (Ibrahim & Garba, 2020; Adeyemi & Dada, 2020).
- **Soil Erosion and Degradation:** Deforestation leads to increased soil erosion, reducing the fertility of the land and affecting agricultural productivity. The removal of vegetation exposes soil to erosion by wind and water, which lowers soil quality and reduces the land's capacity to support agriculture (Ekundayo & Jegede, 2020).
- **Climate Change:** Deforestation reduces the region's ability to absorb carbon dioxide, contributing to global warming. It also exacerbates local climate variability, such as reduced rainfall and higher temperatures. As forests act as carbon sinks, their destruction accelerates climate change both locally and globally (UNEP, 2018; Salami & Adetunji, 2019).
- **Economic Impact:** The loss of forest resources negatively affects the livelihoods of local communities who depend on forests for timber, non-timber products, and agricultural activities. The depletion of forests deepens poverty among residents by reducing the availability of forest products that contribute to their incomes (Akinyemi, 2018; World Bank, 2020).

VII. MITIGATION STRATEGIES

To combat deforestation in Akoko Edo, several strategies should be implemented:

- **Sustainable Agricultural Practices:** Promoting agroforestry, which combines agriculture with tree planting, can help maintain forest cover while increasing agricultural productivity. Agroforestry systems have been shown to reduce deforestation while providing economic benefits (Enabor, 2019).
- **Enforcement of Forest Laws:** Strengthening the enforcement of forestry laws and penalties to curb illegal logging and ensure sustainable timber harvesting is crucial for forest conservation. Effective law enforcement has been identified as a key factor in addressing illegal logging activities (Ogundele & Fakoya, 2020).
- **Community Engagement:** Promoting local participation in forest conservation through education and incentives is essential. By involving communities in sustainable forest management, local populations can benefit from the resources while helping to protect them (Akintola & Olayide, 2018).
- **Reforestation and Afforestation:** The government and local communities should engage in large-scale reforestation projects to restore degraded lands and increase forest cover. Reforestation initiatives have proven effective in reversing deforestation trends and restoring ecosystem services (Jibrin & Hassan, 2021; UNDP, 2021).
- **Public Awareness and Education:** Raising awareness among local communities about the importance of forests and the benefits of sustainable land use practices is critical. Education can foster greater understanding of the consequences of deforestation and encourage sustainable behaviors (Osagie & Ayodele, 2019).
- **Climate Change Adaptation:** Integrating climate change considerations into forest management practices, such as the use of climate-resilient tree species, will help the region adapt to changing weather patterns. Climate-smart strategies can help ensure that forests remain viable even in the face of changing climatic conditions (UNDP, 2021; UNEP, 2021).

VIII. DISCUSSION

The findings of this study highlight the complex interaction of economic, social, and environmental factors contributing to deforestation in Akoko Edo. Agricultural expansion is the primary driver, as the increasing demand for farmland leads to the clearing of forests for crops like cassava, maize, and palm oil. Additionally, illegal logging and firewood collection further strain the forests, with unsustainable extraction practices exacerbating the problem. Urbanization also plays a role, as forested areas are converted for residential and industrial use.

The lack of effective governance, weak enforcement of forest protection laws, and limited awareness of sustainable land management practices compound these issues. The community's involvement in forest conservation is crucial, but this requires significant investment in education, capacity building, and incentives to promote sustainable practices. Moreover, the effects of climate change, such as altered rainfall patterns and prolonged droughts, add further challenges to forest regeneration and conservation efforts.

Implementing the proposed mitigation strategies, such as promoting agroforestry, strengthening law enforcement, and engaging communities in conservation, Akoko Edo has the potential to reverse some of the negative impacts of deforestation. These efforts could improve both environmental sustainability and the livelihoods of local communities, contributing to a more balanced relationship between people and the environment.

IX. CONCLUSION

Deforestation in Akoko Edo is driven by a combination of agricultural expansion, illegal logging, firewood collection, and the effects of climate change. To address these challenges effectively, a comprehensive approach is needed that prioritizes sustainable land use, forest conservation, and climate change adaptation. While agriculture remains vital for the livelihood of local communities, it is essential to balance this with efforts to protect forest ecosystems that provide crucial services such as carbon sequestration, water regulation, and soil conservation. Policies that encourage sustainable farming practices, strengthen forest governance, and promote reforestation are vital to ensuring both environmental sustainability and improved livelihoods for the people of Akoko Edo.

In addition, community engagement is key to the success of these efforts. Raising awareness and providing incentives for sustainable land use practices will ensure local support for conservation initiatives. Collaboration between government agencies, local communities, and environmental organizations is necessary to create long-term solutions that not only protect the environment but also foster economic growth. Integrating conservation with development, Akoko Edo can create a more sustainable future for both its people and the environment.

RECOMMENDATIONS

- The Federal Ministry of Environment should develop and implement comprehensive forest management policies that integrate climate change adaptation strategies. These policies should ensure sustainable forest use, strengthen law enforcement, and address illegal logging to protect the region's forests.
- Local government should collaborate with NGOs and community-based organizations to promote sustainable

land use practices and enforce forest protection laws. This partnership should include raising awareness and providing incentives for farmers and landowners to engage in forest conservation.

- There should be increased funding for reforestation and afforestation programs in Akoko Edo LGA. These programs should focus on restoring degraded lands, planting native tree species, and engaging local communities in long-term forest management efforts.
- Improved access to climate data and climate-smart agricultural techniques should be made available to local farmers. This would allow them to make informed decisions on crop selection, land management, and weather patterns, increasing resilience to climate change.
- Public awareness campaigns should be launched to educate communities on the importance of conserving forests and adopting sustainable practices. These campaigns should highlight the environmental, economic, and social benefits of forest conservation to encourage local participation in protection efforts.
- Stronger enforcement of forest protection laws is necessary to curb illegal logging. This can be achieved through increased monitoring, more stringent penalties for violators, and encouraging community involvement in reporting illegal activities.
- Forest conservation should be integrated into development plans at all levels of government. Ensuring that sustainable land use practices are incorporated into urban and agricultural planning will help balance growth with environmental preservation.

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