International Journal of Sustainable Business Management and Accounting
Volume 1, Issue 1, 20-28.
e_ISSN: 3109-8053
https://e-journal.gomit.id/ijsbma
DOI: 10.58723/ijsbma.v1i1.9

Assessing the Impact of Deforestation on Agricultural Activities and Exploring Management Strategies in Benue South, Nigeria

Shamsu Abdullahi Idris*
Department of Geography, Federal College of Education Odugbo, Benue State, NIGERIA

Nura Saleh
Department of Geography, Federal College of Education Odugbo, Benue State, NIGERIA

Lawan kamiludeen Abba
Department of Architecture, School of Environmental Studies Gwarzo Kano State Polytechnic, NIGERIA

*** Corresponding author:**
Shamsu Abdullahi Idris, Federal College of Education Odugbo, Benue State. ✉ faringani4life@gmail.com

Article Info

Article history:

Received: June 13, 2025
Revised : July 27, 2025
Accepted: July 28, 2025

Keywords:

Agriculture, Benue South, Deforestation, Food security, Forest management, Sustainability

Abstract

ABSTRACT
Background of study: Deforestation has emerged as a major environmental and socio-economic concern, particularly in developing regions where agriculture serves as the primary livelihood. In Benue South, Nigeria, forest degradation is accelerating due to illegal logging, population pressure, and unregulated farming practices—posing a direct threat to agricultural productivity, food security, and rural livelihoods.
Aims and scope of paper: This study aims to assess the perceived impact of deforestation on agricultural activities in Benue South and to identify appropriate community-based management strategies to mitigate its negative effects. The scope includes examining both environmental consequences and socio-economic responses from affected farming communities.
Methods: A mixed-method approach was employed, combining structured questionnaires administered to 729 respondents across five Local Government Areas (LGAs) with Key Informant Interviews (KIIs). Data were analyzed using descriptive statistics and the Relative Importance Index (RII) to rank the severity of perceived deforestation impacts.
Result: Findings reveal that deforestation has led to significant declines in crop yield, soil fertility, and food availability. Respondents also reported increased farm input costs and heightened migration pressure. RII analysis ranked decreased agricultural productivity and climate irregularities as the most critical consequences. Community awareness of forest regulations and reforestation practices was found to be low.
Conclusion: Deforestation in Benue South has a profound negative effect on agriculture and rural stability. To address these challenges, integrated strategies such as participatory forest management, environmental education, and conservation-based farming should be prioritized. Policy alignment between local communities and environmental agencies is essential for sustainable land use.

To cite this article: Idris, S.A., Saleh, N., Abba, L.K . (2025). Assessing the Impact of Deforestation on Agricultural Activities and Exploring Management Strategies in Benue South, Nigeria. *International Journal of Sustainable Business, Management and Accounting, 1*(1), 18-26.

INTRODUCTION

Deforestation is when trees are removed from an area of land so that land can be used for something else. Deforestation can happen when forestland is used for cities, farms, or livestock. Deforestation can also be defined as changing a natural forest into something else, like farmland. In short, deforestation is when a forest is permanently changed to be used for other things (Umar & Haruna, 2025). Growing food is very important for making sure people have enough to eat and for helping economies grow in both rich and poor countries (Wang et al., 2022). Improving farming is often seen as a way to produce more food and protect forests. If farmers can grow more food on each piece of

land, they won't need as much land, which could reduce the pressure to turn forests into farmland (De Blécourt et al., 2018). In Central Africa, most farming is still done using traditional methods. Small-scale farmers who use these methods usually farm a piece of land for two years and then let it rest for seven to 10 years (Gérard et al., 2021).

The socioeconomic effects of deforestation are very important. When people change forests, it greatly affects the global environment and causes a major loss of biodiversity, which impacts rural development. Forests are cut down, damaged, and broken up by logging, farming, road building, fires caused by people, and other activities. People have always tried to use and control forests, which has constantly changed the Earth, in many societies, lands, and usually within international and local government or community groups . A livelihood includes the skills, resources (money, nature, community, tools, and people), and actions needed to make a living. A livelihood is sustainable if it can survive problems and recover, while also protecting or improving its ability to support future generations.

The world's forests cover about 4 billion hectares, which is around 30% of the Earth's land. However, this area is decreasing by 13 million hectares each year, which is considered an 'alarming rate'. Deforestation is happening most in tropical areas like South America, Central West Africa, and South and Southeast Asia. Forests help the environment by controlling weather and climate on local, regional, and global levels. Because of this, deforestation not only destroys forest habitat but also causes indirect problems when these environmental services are lost. It's known that deforestation releases carbon dioxide, which adds to global climate change, but the expected effects on weather are less known. This report looks at published studies about these indirect effects of deforestation and how they might affect agriculture (Luo et al., 2022). Different people have different ideas about what causes deforestation. Many believe that poverty, population growth, hunger, and widespread illiteracy are the main reasons. Others think deforestation happens because forest communities don't have other ways to make a living, and the forest is their only source of income and food (Bobbio, 2019) . It may be true that a lack of other ways to make a living contributes to deforestation. Besides farming, hunting, illegal logging, and charcoal production, most people in rural areas don't have good ways to earn money. This forces rural communities to depend on forest land for farming and other activities that can harm the forest (Haji et al., 2021; Prochazka et al., 2023).

Nigeria has a lot of land covered by forests. These forests include swamp forests in the far south, rainforests in the Southwest, and wooded savanna in the middle and northern areas. Abdulmalik (2020) say that Nigeria is one of the countries with many forest resources. Akintoye (2025) said that forests in Nigeria cover about 110,890 km2 of the country's total land area of about 910,770km2, which is about 12.18% of all the plants in the country. This research looked at how deforestation affects farming in Benue South. The goals of the research were to find out what people think about how deforestation affects farming, and to study the social and economic effects of deforestation on farming.

The study looked at the Benue South area, which has nine Local Government Areas (LGAs). Five LGAs were chosen for the study: Agatu, Apa, Ador, Otukpo, and Obi LGAs. Apa LGA is in the northwest of Benue State, between Latitude 7°20′ North and 7°50′ North, and Longitude 7° 40′ East and 8°10′ East. It shares borders with Agatu LGA to the North, Otukpo LGA to the South, Gwer-West LGA to the East, and Olamaboro LGA of Kogi State to the West. Apa Local Government Area (LGA) is based in Ugbokpo. It includes 11 council wards and covers about 995 km^2 of land. In 2023, the estimated population is about 146,138 people (Bauchi & Othman, 2020). The area's climate is classified as Koppen's Aw, meaning it has clear wet and dry seasons. The rainy season lasts for seven months, from April to October. During this time, rainfall ranges from 1,200 to 2,000 mm each year. The dry season is from November to March (Ikpe et al., 2021). Temperatures stay fairly high, averaging 28-32°C and sometimes reaching 37°C.

The area is mostly guinea savanna, with rough grasses and a few trees. Thick forests are rare, mainly seen as gallery forests, village forests, or protected forest areas (Fagge, 2022). Farming is the main part of the LGA's economy, employing more than 70% of the people. The area's location, spanning both the forest zone (good for tree crops) and the savanna (good for growing grains), gives it a special advantage in agriculture (Ikpe et al., 2021). Otukpo LGA is located in Benue State, Nigeria, between 7° and 7°45' North latitude and 7°35' and 8°30' East longitude. According to the 2006 national census, 261,666 people live in the LGA, including 133,347 males and 128,319 females. The climate is tropical, with an average yearly temperature of 27.2 °C. The area gets a lot of rain, with an average of 1723 mm per year. Obi LGA is one of the 23 Local Government Areas in Benue State, and it's in the central agricultural area (Zone C) and the Middle Belt zone. It's located between latitude 0705′ and 70 15′N and longitude 90 and 90 6′E, and it covers about 2229 km^2 of land. About 168,491 people live there. The area has a tropical climate, with an average yearly temperature of about 27°C. The region has two different seasons: a wet season from April to October and a dry season from November to March.

Agatu LGA, carved out from Apa LGA in 1996, comprises 10 wards and stretches from latitude 7°45′ to 8° N and longitude 7°50′ to 8° E. The LGA has a total area of about 1001 km^2 and a population of 115,597 people (2006 Census). Agatu shares borders with Nasarawa State to the North, Apa LGA to the South, Gwer West to the East, and Omale LGA (Kogi State) to the West. The area experiences two distinct seasons: a rainy season from April to October and a dry season from November to March, with temperatures ranging from 23 to 35°C.The study area falls within the Southern Guinea Savannah, characterized by coarse grasses and scattered tree species. Persistent clearance for arable agriculture and bush fallowing has led to re-growth vegetation. Economic vegetation includes locust bean, shea tree, mahogany and Isoberlina Doka, and fruit trees like mango.

Figure 1. Map of South Benue

METHOD

This study was conducted across the five local government Areas (LGAs) of Benue South Senatorial zone, Nigeria, namely Agatu, Apa, Otukpo, Ador, and Obi. A systematic selection of participants from

these LGAs was made for administering questionnaires and focused group discussions (FGDs). Additionally, key informant interviews (KIIs) were conducted to gather relevant information from respondents.

To determine the sample size, Krejcie and Morgan's (1970) method was employed. According to this method, for a population ranging from 500,000 to 10,000,000, a sample size of 783 is recommended. Each LGA received an equal number of questionnaires, which can be expressed mathematically as:

$$Qi = \frac{QT}{N}$$

Where:

- Qi = Number of questionnaires allocated to each LGA
- QT= Total number of questionnaires (790)
- N = Number of LGAs (5)

$$Qi = \frac{790}{5} = 158$$

Thus, each LGA received 158 questionnaires.

Table 1. Questionnaire Distribution Data

S/N	LGAs	Population (2006 Census)	Allocated Sample Size
1	Apa	96,780	158
2	Agatu	115, 597	158
3	Otukpo	266,411	158
4	Ohimini	70,688	158
5	Obi	8,707	158
	Total	558,183	790

Sources: Fieldwork, 2024.

A purposive sampling technique was employed to administer questionnaires across the five Local Government Areas (LGAs) of the study area. A total of 790 questionnaires were distributed equally among the five LGAs, with 158 questionnaires allocated to each LGA, ensuring proper representation. Of these 790 questionnaires administered, yielding a response rate of 92.4% (n = 729), which formed the basis of the dataset analyzed in this study.

The collected data were analyzed and discussed using descriptive statistics, including frequency tabulation and percentage. The Relative Importance Index (RII) technique was utilized to assess the impact of deforestation on agricultural activities. Respondents' answers were examined, ranked, and scored based on their frequency using the RII method, providing a comprehensive understanding of the relationships between deforestation and agricultural activities.
RII is donated by

$$\frac{\Sigma W}{AXN} \quad \ldots\ldots (1)$$

Where
W= weight given to each factor by respondents
A= Height or Weight (i.e. 5)
N= Total number of the respondents

RESULTS AND DISCUSSION

Result

The respondents in table 1 indicated that 16% of the residents believed that deforestation practices severely affected agricultural activities in the study area. The findings also shows that 48% of the respondents agreed that deforestation practices affect agricultural activities moderately, this is due to the recent reduction in crop yield and decline in soil fertility as a result of soil degradation cause by excessive deforestation practices. The findings furthered revealed that about 22% of the residents

believed deforestation practices rarely affect agricultural activities while 14% do not identify any influences on agricultural activities cause by deforestation practices in the study area.

Table 2. Perception on how deforestation affects agricultural activities

S/N	Variables	Respondents	Percentage
1	Severely	119	16
2	Moderately	351	48
3	Rarely	161	22
4	Not at all	98	14
	Total	729	100

Sources: Field work, 2024

The results in Table 2 revealed that the respondents noticed changes in agricultural productivity caused by serial deforestation practices in the study area with soil degradation having a RII of 0.76 which ranked 1st , followed by decreased in crop yield with RII of 0.70 which ranked 2nd. The findings equally discovered that increased in growing season and loss of biodiversity has a RII of 0.54 and 0.46 which ranked 3rd and 4th respectively.

Table 3. Notification of changes in agricultural productivity

S/N	Variables	SA	A	U	SD	D	RII	RANK
1	Decreased in crop yield	142	289	126	88	84	0.70	2
2	Soil degradation	191	406	25	37	70	0.76	1
3	Changes in growing season	111	132	38	46	402	0.46	3
4	Loss of biodiversity	89	237	59	85	259	0.54	4

Sources: Field work, 2024.
Key: SA = Strongly Agree A = Agree U = Undecided SD = Strongly Disagree D = Disagree

Table 3 presents the respondents perception of the socio-economic impacts of deforestation on agricultural activities. Approximately 44% of the respondents agreed that food security is the most significant socio economic consequence of deforestation, while 27% disagreed and 19% remained undecided. Additionally, 14% of the respondents strongly agreed, and 12% strongly disagreed with this assertion. In relation to poverty, the findings indicated that the majority 58% strongly disagreed that deforestation contributes to increase poverty levels. Meanwhile, 24% disagreed, 10% agreed, 8% strongly agreed and none of the respondents were undecided on this matter. Regarding to migration and displacement as potential socio economic impacts, 69% of the respondents strongly disagreed and 20% disagreed. Only 6% agreed and 5% strongly agreed with the statement. Finally, when asked about the impact of deforestation on economic opportunities, 66% of the respondents strongly disagreed with the notion that deforestation leads to a decrease in such opportunities, while 19% disagreed. On the other hand, 7% agreed, 8% strongly agreed, and no respondents were undecided.

Table 4. Socioeconomic impact of deforestation on agricultural activities

S/N	Variable	SA	A	U	SD	D
1	Food security	99 (14%)	321(44%)	19 (3%)	92 (12%)	198 (27%)
2	Loss of income and livelihood	58(8%)	74 (10%)	0	421 (58%)	176(24%)
3	Migration and displacement	36(5%)	41(6%)	0	506(69%)	146(20%)
4	Decrease economic activities	61(8%)	50(7%)	0	481(66%)	137(19%)

Sources: Field work, 2024.

Discussion

In Table 1, 16% of the people surveyed said that deforestation greatly harmed farming in the area. This agrees with Oghenero (2022), who said that deforestation hurts farming. The results also show that 48% of those surveyed agreed that deforestation somewhat affects farming. This is because crops have been producing less and the soil is becoming less fertile because deforestation is damaging the soil. Lawrence (2022) studied how tropical deforestation affects climate and agriculture. Their study found that deforestation leads to less rain and hurts future farming. Also, deforestation causes the average temperature to rise, leading to more extreme heat and less rain. The study also showed that about 22% of the people surveyed thought deforestation rarely affected farming, while 14% did not see any effects of deforestation on farming in the area.

The results in table 2 showed that people noticed changes in how much farms produced because of ongoing deforestation in the area. Soil degradation was the biggest issue, with an RII of 0.76, ranking it first. This agrees with a study by (Abdulmalik et al., 2020), who found that the main effect of deforestation on productivity is the loss of soil nutrients. In some places, soil erosion from deforestation causes farming problems and power outages (Bodo et al., 2021). According to Oghenero et al (2022), people said that the average amount of food crops grown in the area hasn't been very high because the soil isn't as fertile. Even a crop like cocoyam has been declining in production for years. The study also found that crop yields decreased, with an RII of 0.70, ranking it second. Dhakane (2024) discovered that deforestation can lower crop yields by up to 30% by changing the local climate, damaging the soil, and reducing ecosystem benefits. The study also found that longer growing seasons and loss of biodiversity had RIIs of 0.54 and 0.46, ranking them third and fourth, respectively. A longer dry season and less rain when the seasons change could limit how much farms can produce (Zhang et al., 2023). Deforestation adds to the greenhouse gases in the atmosphere every year, leading to habitat loss because trees, which store carbon, are constantly being cut down, according to Umar & Haruna (2025). This result matches the findings of Osoba (2019), who said that clearing forests for farming harms local ecosystems, including the local climate, soil, water, and the ecology of plants and animals, as well as factors that cause human diseases.

Table 3 shows how the people surveyed felt about how deforestation affects farming and the economy. About 44% of those surveyed agreed that the biggest economic problem caused by deforestation is food shortages, while 27% disagreed and 19% were unsure. In addition, 14% of those surveyed strongly agreed, and 12% strongly disagreed with this idea. This agrees with Tsegaye (2023), who said that cutting down trees does not help a community's economy but instead threatens people's living standards and causes food shortages. Regarding poverty, the study found that most people (58%) strongly disagreed that deforestation increases poverty. Meanwhile, 24% disagreed, 10% agreed, 8% strongly agreed, and none of the people surveyed were undecided. Poor people rely heavily on local resources for food, shelter, and well-being, which leads to farming decline and deforestation. Regarding migration and displacement as possible economic effects, 69% of those surveyed strongly disagreed and 20% disagreed. Only 6% agreed and 5% strongly agreed with the statement. This aligns with Ceddia (2019), who reported that most migration today is from rural to urban areas, but the small number of farmers moving from rural to rural areas in search of farmland has a large impact on global deforestation, especially in and around protected areas. Finally, when asked about how deforestation affects economic opportunities, 66% of those surveyed strongly disagreed that deforestation reduces these opportunities, while 19% disagreed. However, 7% agreed, 8% strongly agreed, and none of the people surveyed were undecided. This agrees with the findings of Bhardwaj (2020), which found that selling wood products is a major source of income for national and local governments, as well as traditional leaders and individuals. This often comes as export money, taxes, royalties, and personal income for those involved in using forest products. The study by Olowoyeye (2021) also showed that the prices of forest products and GDP indirectly affect deforestation, and that population and poverty increase deforestation.

CONCLUSION

The public perception, as gathered from field surveys and community feedback, indicates a growing awareness of the negative effects of forest loss, including reduced soil degradation, loss of biodiversity, irregular rainfall patterns, and declining crop yields. Furthermore, socio-economic consequences such as loss of livelihood, food insecurity, migration and displacement and increased rural poverty were consistently highlighted by local farmers and stakeholders. Deforestation in Benue South is largely driven by unsustainable farming practices, fuel wood collection, and commercial logging, all of which contribute to the degradation of arable land. These environmental pressures directly affect the agricultural sector, which is the economic backbone of the region. The study also found a gap in policy enforcement and limited adoption of sustainable land-use practices, which exacerbate these challenges.

To mitigate the impact of deforestation on agricultural activities in Benue South, it is imperative to implement sustainable land management practices that promote environmental conservation while enhancing agricultural productivity. Community education and awareness programs should be prioritized to sensitize farmers and local stakeholders on the consequences of forest depletion and the importance of sustainable resource use. Agro forestry and conservation agriculture should be promoted to restore soil fertility, reduce erosion, and increase crop resilience. Strengthening agricultural extension services and providing access to improved seedlings and technologies can empower farmers to adopt climate-smart practices that reduce the pressure on forest lands.

Furthermore, government and relevant agencies should enforce existing environmental and forestry regulations to curb illegal logging and land degradation. There is a need to support community-based forest management initiatives that involve local people in the stewardship of natural resources. Alternative livelihood programs, such as beekeeping, fish farming, and eco-tourism, can help reduce dependence on deforestation-driven income sources. Ultimately, aligning environmental protection with socio-economic development will foster sustainable agriculture, preserve biodiversity, and secure the livelihoods of rural communities in Benue South.

ACKNOWLEDGMENT

The authors would like to express their sincere gratitude to all individuals and institutions who supported the completion of this research. Special thanks are extended to local authorities and community members in Benue South, Nigeria, for their willingness to provide valuable information and insights during the data collection process. The authors also acknowledge the contributions of academic peers who offered constructive feedback on the manuscript. This study was conducted independently without external funding, and the authors take full responsibility for its contents.

AUTHOR CONTRIBUTION STATEMENT

Shamsu Abdullahi Idris was responsible for developing the research concept, designing the methodology, and drafting the introduction and background of the study. Nura Saleh conducted the literature review, data collection, and analysis using the Relative Importance Index (RII), and contributed to writing the methods and results sections. Lawan Kamiludeen Abba worked on interpreting the findings, drafting the discussion and conclusion sections, and conducting the final review and editing of the manuscript. All authors read and approved the final version of the manuscript submitted for publication.

REFERENCES

Abdulmalik, D., Bunza, M. R., MA, S., Gupa, M. A., & Bilyaminu, A. (2020). Evaluation of Farmer's

Perception on Deforestation and Its Impact on Agricultural Production, Gaya Local Government Area, Kano State, Nigeria. *South Asian Research Journal of Agriculture and Fisheries*, *02*(02), 31–37. https://doi.org/10.36346/sarjaf.2020.v02i02.003

Akintoye, O. A., Mfon (Jr), P., Mfon, G., Olorundami, T., Uka Ukata, S., & AdesolaAkintoye, T. (2025). Challenges of Deforestation in Nigeria and the Millennium Development Goals. *SSRN Electronic Journal*, *9*(May 2014), 76–94. https://doi.org/10.2139/ssrn.5257800

Bauchi, F. P., & Othman, M. F. (2020). A Review of Population and Housing Census in Nigeria (Simplified Version). *Internasional Journal of Public Administration Studies*, *August*, 1–29. https://doi.org/10.13140/RG.2.2.11515.13603

Bhardwaj, Y. (2020). Encyclopedia of Animal Cognition and Behavior. *Encyclopedia of Animal Cognition and Behavior*, *December*, 1–5. https://doi.org/10.1007/978-3-319-47829-6

Bobbio, L. (2019). Designing effective public participation. *Policy and Society*, *38*(1), 41–57. https://doi.org/10.1080/14494035.2018.1511193

Bodo, T., Gimah, B. G., & Seomoni, K. J. (2021). Deforestation and Habitat Loss: Human Causes, Consequences and Possible Solutions. *Journal of Geographical Research*, *4*(2), 22–30. https://doi.org/10.30564/jgr.v4i2.3059

Ceddia, M. G. (2019). The impact of income, land, and wealth inequality on agricultural expansion in Latin America. *Proceedings of the National Academy of Sciences of the United States of America*, *116*(7), 2527–2532. https://doi.org/10.1073/pnas.1814894116

De Blécourt, M., Röder, A., Gröngröft, A., Baumann, S., Frantz, D., & Eschenbach, A. (2018). Deforestation for agricultural expansion in SW Zambia and NE Namibia and the impacts on soil fertility, soil organic carbon- and nutrient levels. *Biodiversity & Ecology*, *6*(April), 242–250. https://doi.org/10.7809/b-e.00330

Dhakane, A. A., Osman, M. F., Afrah, N. A., & Ahmed, A. O. (2024). The Effect of Deforestation on Agriculture Production. *Journal of Agriculture and Veterinary Science*, *17*(6), 45–49. https://doi.org/10.9790/2380-1706014549

Fagge, A. M. (2022). Residents ' Coping Measures in Flood Prone Areas of Hadejia – Jamaare River Basin , Jigawa State. *Academia Journal of Environmetal Science*, *10*(February), 31–45. https://doi.org/10.15413/ajes.2021.0115

Gérard, N., Gbènato, L., & Idjibgerou, E. S. (2021). Impact Sur La Biodiversité Végétale Sévérin National de la télédétection et de suivi Ecologique (CENATEL), Cotonou , Bénin RESULTATS / DISCUSSION Changement de l ' occupation des terres : OBJECTIF GENERAL Evaluer l ' impact de la dynamique du couvert fo. *Symposium Digital*, *5*(February). https://doi.org/10.13140/RG.2.2.19984.53764

Haji, L., Valizadeh, N., & Hayati, D. (2021). The Role of Local Communities in Sustainable Land and Forest Management. *Environmental Science and Engineering*, *September*, 1–36. https://doi.org/10.1007/978-3-030-56542-8

Ikpe, E., Idoma, K., & Ahmad, Y. U. (2021). Effect of Rainfall Variability on Yield of Selected Crops in Benue State, Nigeria. *Journal of Meteorology and Climate Science*, *22*(June), 1–203. https://doi.org/10.13140/RG.2.2.12439.34721

Lawrence, D., Coe, M., Walker, W., Verchot, L., & Vandecar, K. (2022). The Unseen Effects of Deforestation: Biophysical Effects on Climate. *Frontiers in Forests and Global Change*, *5*(March), 1–13. https://doi.org/10.3389/ffgc.2022.756115

Luo, X., Ge, J., Guo, W., Fan, L., Chen, C., Liu, Y., & Yang, L. (2022). The Biophysical Impacts of Deforestation on Precipitation: Results from the CMIP6 Model Intercomparison. *Journal of Climate*, *35*(11), 3293–3311. https://doi.org/10.1175/JCLI-D-21-0689.1

Oghenero, M. J., Danladi, T. E., & Elizabeth, E. (2022). The Effect of Deforestation on the Economic Activities of the Inhabitants of Abaji Area in Abuja. Nigeria. *International Journal of Physical and Human Geography*, *10*(1), 30–47. https://doi.org/10.37745/ijphg.13/vol10n13047

Olowoyeye, T. (2021). a Review of the Environmental Impact of Deforestation and Industrial Activities in Nigeria. *Preprint, January*, 1–16. https://doi.org/10.13140/RG.2.2.12984.98564

Osoba, A. E., Atanda, T. A., & Bola, T. S. (2019). Effect of Deforestation on Rural Household Income in Selected Forest Dependent Commuinities in Odeda Local Council Area of Ogun State, Nigeria. *Asian Journal of Research in Agriculture and Forestry*, *July*, 1–10. https://doi.org/10.9734/ajraf/2019/v3i330042

Prochazka, P., Abrham, J., Cerveny, J., Kobera, L., Sanova, P., Benes, D., Fink, J. M., Jiraskova, E., Primasova, S., Soukupova, J., & Smutka, L. (2023). Understanding the socio-economic causes of deforestation: a global perspective. *Frontiers in Forests and Global Change*, *6*(October), 1–11. https://doi.org/10.3389/ffgc.2023.1288365

Tsegaye, A., Demissew, A., Hawaria, D., Abossie, A., Getachew, H., Habtamu, K., Degefa, T., Wang, X., Lee, M. C., Zhou, G., Yewhalaw, D., & Yan, G. (2023). Anopheles Larval Habitats Seasonality and Environmental Factors Affecting Larval Abundance and Distribution in Arjo-Didessa Sugar Cane Plantation, Ethiopia. *Malaria Journal*, *22*(1), 1–12. https://doi.org/10.1186/s12936-023-04782-1

Umar, M. K., & Haruna, A. U. (2025). Environmental Adult Education and its Relevance in Mitigating Environmental Hazards in Nigeria. *International Journal of Library Science & Education Research*, *8*(8), 45–52. https://doi.org/10.70382/caijlser.v8i8.021

Wang, L., Mehmood, U., Agyekum, E. B., Uhunamure, S. E., & Shale, K. (2022). Associating Renewable Energy, Globalization, Agriculture, and Ecological Footprints: Implications for Sustainable Environment in South Asian Countries. *International Journal of Environmental Research and Public Health*, *19*(16). https://doi.org/10.3390/ijerph191610162

Zhang, J., Wu, J., Hughes, A. C., Kaplan, J. O., & Maeda, E. E. (2023). Bio-geophysical feedback to climate caused by the conversion of Amazon Forest to soybean plantations. *Science of the Total Environment*, *905*(January), 166802. https://doi.org/10.1016/j.scitotenv.2023.166802