

# Strengthening Afforestation Efforts through Environmental Awareness Creation in Rivers State.

R.S. Bell-Gam Ph.D

Department of Adult and Non-Formal Education, Faculty of Education, University of Port Harcourt, Rivers State, Nigeria.

DOI: <https://doi.org/10.51583/IJLTEMAS.2026.150100081>

Received: 28 January 2026; Accepted: 02 February 2026; Published: 10 February 2026

## ABSTRACT

Forests play a vital role in sustaining livelihoods, biodiversity, and climate stability, yet in Rivers State, Nigeria, rapid deforestation threatens these benefits. This paper examines the critical role of environmental education and awareness creation in strengthening afforestation efforts and promote sustainable forest management in Rivers State. It emphasises the growing threats of deforestation, environmental degradation and climate change and argues that limited public awareness remains a major barrier to sustainable forest management. Based on existing literature and circumstances in Rivers State, the paper highlights the need for a people-centered approach that goes beyond tree planting to foster environmental stewardship among communities. Five key suggestions were proposed as a call to action amongst which were: that there should be an implementation of comprehensive environmental education programmes at all levels of society, including schools, communities, and workplaces by the Rivers State Ministries of Education, Agriculture and Forestry; that there should be an advocacy for the development and implementation of policies that incentivise afforestation and sustainable forest management practices; that there should be a facilitation of collaboration and partnerships between governments, non-governmental organisations, businesses, and international stakeholders to support afforestation initiatives and promote forest conservation globally. By implementing these suggestions, we can harness the transformative power of environmental awareness to address the urgent challenges facing forests and pave the way towards a more sustainable and resilient future for all.

**Key Words:** Afforestation, Deforestation, Sustainable Forest Management and Environmental Awareness

## INTRODUCTION

Human societies, throughout history have been deeply intertwined with their natural environments, from hunter-gatherer communities to modern urban dwellers. Humans have relied on nature for sustenance, shelter, and spiritual nourishment. The rapid pace of industrialisation, urbanization, and technological advancement in recent centuries has strained this age-old relationship, leading to widespread environmental degradation and ecological imbalance. In the quest for economic progress and material wealth, man has often prioritised short-term gains over the long-term health of the planet. Pollution, deforestation, habitat destruction, and climate change are just some of the consequences of this unsustainable approach to development. Amidst these challenges, there exists a growing realisation of the intrinsic value of nature and the urgent need to cultivate a more harmonious relationship between man and his environment which will give rise to an eco-friendly environment.

An eco-friendly environment is one in which human activities are conducted in a manner that minimises harm to the natural world and promotes sustainability for future generations. It encompasses practices such as conservation, recycling, renewable energy adoption, and the preservation of biodiversity. Eco-friendliness is about recognising the interconnectedness of all life forms and understanding that our actions have far-reaching consequences on the health and well-being of the planet (Simion, 2023). Achieving a truly eco-friendly environment requires a fundamental shift in mindset, values, and behaviours at both individual and societal levels. It calls for a re-evaluation of our consumption patterns, production methods, and resource management practices to ensure that they are in harmony with the Earth's natural systems. It also entails adopting innovative technologies and policies that promote environmental conservation and foster sustainable development.

Man in his attempt to survive has gone into various unsustainable means of survival which includes deforestation, without minding the effects it has on the environment. Man has to be sensitised on the dangers of his actions on the environment and one of the ways by which this awareness can be achieved is through education.

Education plays a crucial role in fostering environmental consciousness and empowering individuals to make informed choices that benefit both people and the planet (Rieckmann, 2018). By raising awareness about the importance of biodiversity, the impacts of climate change, and the value of ecosystems services, education can inspire people to become stewards of the environment and champions of sustainability in their communities. Fostering a deeper connection with nature is essential for cultivating a sense of reverence and respect for the natural world. Spending time outdoors, immersing oneself in the beauty of forests, mountains, and oceans, and engaging in activities such as hiking, gardening, and wildlife observation can help nurture this connection and foster a sense of responsibility towards protecting the Earth's precious resources.

Rivers State, located in the Niger Delta region of Nigeria, boasts diverse ecosystems ranging from its rich rainforests to intricate river networks. However, over the years, rapid urbanization, industrialisation, and unsustainable land use practices have taken a toll on its natural landscapes, leading to deforestation and environmental degradation. One of the critical consequences of this degradation is the dwindling forest cover, which significantly impacts biodiversity, water resources, and the livelihoods of the communities that are dependent on these ecosystems (Duguma, Atela, Minang, Ayana, Gizachew, Nzyoka & Bernard, 2019). Afforestation, a proactive measure entailing the deliberate establishment of forests by planting seeds or young trees in barren or degraded areas, holds immense promise in combating the increasing deforestation rampant in Rivers State and mitigating its far-reaching consequences. By strategically introducing vegetation where none existed previously, afforestation serves as a vital tool in reversing ecological degradation, restoring biodiversity, mitigating soil erosion, and enhancing carbon sequestration.

The success of afforestation initiatives transcends mere tree planting endeavours; it necessitates the cultivation of a profound and enduring sense of environmental stewardship among the local communities. While the physical act of planting trees is crucial, it is only the first step in a multifaceted process that requires active engagement, education, and empowerment of the people who inhabit and interact with these landscapes. In Rivers State, where socio-economic pressures and developmental aspirations often clash with environmental conservation efforts, fostering environmental stewardship becomes even more imperative. It entails instilling in the residents a deep appreciation for the intrinsic value of their natural surroundings, nurturing a sense of responsibility towards safeguarding these resources for future generations, and empowering them to actively participate in conservation initiatives.

This holistic approach to afforestation acknowledges the intricate interplay between ecological restoration and socio-cultural dynamics. It recognises that sustainable change cannot be achieved through top-down directives alone but requires grassroots involvement, community mobilisation, and the integration of traditional knowledge systems with modern scientific practices (Reinecke & Blum, 2018). Environmental awareness plays a pivotal role in driving sustainable behaviour change and garnering community support for afforestation efforts. In Rivers State, despite various governmental and non-governmental interventions aimed at afforestation, the lack of robust environmental awareness campaigns tailored to the specific socio-cultural context of the region has posed challenges to the effectiveness and sustainability of afforestation initiatives. Based on these challenges, the study therefore seeks to explore environmental education and awareness creation initiatives in strengthening afforestation efforts in Rivers State.

## **Theoretical Review**

### **Social Cognitive Theory (SCT)**

Social Cognitive Theory (SCT), developed by Albert Bandura (1986), posits that individuals learn through observation, imitation, and modeling, and their behaviour is influenced by both personal factors and environmental stimuli. This theory emphasises the interplay between cognitive processes, behaviour, and the social environment, making it relevant for understanding and promoting environmental awareness and action.

Using Social Cognitive Theory (SCT) to raise environmental awareness for afforestation in Rivers State can encourage people to adopt eco-friendly behaviours. This approach involves showcasing examples of successful afforestation projects, highlighting benefits such as improved biodiversity and enhanced ecosystem services, and helping people acquire the skills and confidence necessary for sustainable actions. SCT also highlights the importance of social norms and collective efforts in supporting community projects, underscoring the need for advocacy and supportive policies to foster lasting environmental care and sustainable afforestation (Geidam & Lukman, 2023).

## Empirical Review

Owoeye, Olayide and Njuguna (2019) assessed afforestation activities in Embu and Kirinyaga counties in Kenya and the contributions of the Upper Tana Natural Resources Management Project (UTNRMP) to livelihood and environmental sustainability. Quantitative and qualitative research methods were adopted for the study. The representative sample of 421 households was randomly selected and interviewed with the aid of a well-structured questionnaire. Focus group discussions and key informant interviews were also conducted. Data were analysed using descriptive and inferential statistics. It was revealed that afforestation in the catchment area has improved and the presence of community forest associations (CFAs) has led to increases in forest cover in most of the forests as areas initially degraded have been rehabilitated and there has been enhanced species regeneration. For instance, the New Njukiri CFA in Embu West, Kirimari Ward, has planted 150,000 tree seedlings, 75% exotic and 25% indigenous tree species, in 2 years (2015-2017) with an average survival rate of 75%, while the Kangaita Community Forest Users Association has rehabilitated 55 hectares of the Kangaita Forest in Kirinyaga County. The UTANRMP has led to improvements in the level of mutual accountability, conservation awareness, and learning. Communities have embraced new sources of income like ecotourism, beekeeping and the Plantation Establishment and Livelihood Scheme (PELIS) which has helped in increasing forest cover as well as improving food security. The study revealed improved income as the average household monthly income was over 20,000Ksh. Similarly, the average household meal per day was 3 meals and 81.7% of the households indicated no hunger in the last 1 month before the study. Results also revealed that social and economic factors significantly influenced livelihood diversification and afforestation in the catchment area. Overall, the UTNRMP has contributed significantly to livelihood diversification, increased level of afforestation, enhanced community-based mutual accountability and learning as well as ensured environmental sustainability. However, there is the need to put in place a sustainable natural resources management framework for enhancing a sustainable balance in afforestation and livelihood in Kenya.

## Man-made activities towards deforestation in Rivers State.

Deforestation, the widespread clearance of forests for various human activities, remains one of the most pressing environmental challenges of our time. In most rural communities in Rivers State, fueled by economic growth, population expansion, and industrialisation, man-made activities continue to drive significant rates of forest loss, with profound implications for biodiversity, climate stability, and human well-being (Srivastav & Srivastav, 2019).

1. **Agricultural Expansion:** Agriculture is one of the primary drivers of deforestation in Rivers State especially in local Government Areas like Port-Harcourt, Ogba/Egbema/Ndoni, Obio/Akpor, Emuoha, Oyigbo, Etche and so on. As demand for food, timber, and other agricultural commodities rises, forests are cleared to make way for cropland, pastureland, and plantations. Large-scale commercial agriculture like planting of yams, cocoyams, cassava and palm oil production, often leads to extensive deforestation.
2. **Logging and Timber Harvesting:** Logging for timber extraction remains a major contributor to deforestation, particularly in old-growth and high-biodiversity forests. Unsustainable logging practices, including clear-cutting and selective logging, degrade forest ecosystems, disrupt wildlife habitats, and compromise the ecological integrity of forest landscapes. Illegal logging, powered by high demand for timber products, exacerbates deforestation rates and undermines efforts towards sustainable forest management (Kumar et al., 2019).

3. **Infrastructure Development:** The expansion of infrastructure, including roads, highways, dams, and urban settlements, often necessitates the clearing of large tracts of forested land. Infrastructure projects associated with resource extraction, such as mining and oil exploration, further accelerate deforestation by fragmenting forest habitats, disrupting ecological connectivity, and facilitating access to previously inaccessible areas (Cruz et al., 2023).
4. **Forest Conversion for Energy Production:** The conversion of forests into biofuel plantations and biomass energy crops is another significant driver of deforestation, particularly in regions where energy demands are high and incentives for renewable energy development exist. While bioenergy can offer alternatives to fossil fuels, large-scale monoculture plantations for biofuel production can displace natural forests, degrade soil quality, and exacerbate carbon emissions if not managed sustainably (Agholor, 2021).
5. **Illegal Activities:** Illegal activities, including poaching, mining, and land grabbing, pose significant threats to forest ecosystems and contribute to deforestation and forest degradation. Weak law enforcement, corruption, and inadequate governance frameworks enable these illicit practices to thrive, undermining efforts to conserve and sustainably manage forest resources (Kinda & Thiombiano, 2021).

The consequences of deforestation are far-reaching and multifaceted, impacting biodiversity, climate change, water cycles, and human livelihoods. Loss of habitat leads to species extinction and disrupts ecosystem services essential for human well-being, such as pollination, water purification, and carbon sequestration. Deforestation also contributes to climate change by releasing carbon stored in forests into the atmosphere, exacerbating global warming and altering weather patterns (Longobardi, Montenegro, Beltrami & Eby, 2016). Addressing deforestation in Rivers State requires concerted efforts at local, state and national levels. Implementing policies and strategies that promote sustainable land use practices, protect forests and biodiversity, and support community-based conservation initiatives is essential. Enhancing law enforcement, promoting sustainable livelihoods, investing in reforestation and afforestation efforts, and fostering international cooperation are critical steps towards combating deforestation and securing a sustainable future for generations to come.

### **Effects of Deforestation in Rivers State.**

Deforestation stands as a menacing challenge in our contemporary society, posing grave threats to ecosystems, biodiversity, climate stability, and human well-being (Buwani, 2017). Despite increased awareness and conservation efforts, the relentless clearing of forests continues unabated, driven by a myriad of factors rooted in human activities and socio-economic dynamics.

- A. **Loss of Biodiversity:** Perhaps one of the most immediate and severe consequences of deforestation is the loss of biodiversity. Forests harbour an astonishing array of plant and animal species, many of which are unique and irreplaceable. As forests are cleared to make way for agriculture, infrastructure, and urbanization, countless species lose their habitats, leading to population declines, species extinctions, and irreversible damage to ecosystems.
- B. **Climate Change Impact:** Deforestation is a significant contributor to climate change, as forests play a crucial role in regulating the Earth's climate by sequestering carbon dioxide from the atmosphere. When trees are cut down or burned, carbon stored in the biomass is released back into the atmosphere, exacerbating the greenhouse effect and contributing to global warming. Furthermore, deforestation disrupts local and regional weather patterns, leading to increased incidence of extreme weather events such as droughts, floods, and wildfires.
- C. **Soil Degradation and Erosion:** Forests play a vital role in soil conservation, helping to prevent erosion, retain moisture, and maintain soil fertility. When forests are cleared, particularly through practices like slash-and-burn agriculture, the exposed soil becomes vulnerable to erosion by wind and water. This leads to loss of topsoil, reduced agricultural productivity, sedimentation of waterways, and increased vulnerability to landslides and flooding.
- D. **Disruption of Indigenous Communities:** Deforestation often encroaches upon the territories of indigenous peoples and local communities who depend on forests for their livelihoods, cultural identity, and spiritual well-being. Forced displacement, loss of traditional knowledge, and socio-economic marginalisation are

common consequences of deforestation, further exacerbating social inequalities and undermining indigenous rights.

- E. **Global Socio-economic Implications:** The impacts of deforestation extend far beyond the boundaries of forested regions, affecting global socio-economic systems and exacerbating existing inequalities. Loss of ecosystem services provided by forests, such as clean air, clean water, and pollination, can have profound implications for human health, food security, and economic stability, particularly in vulnerable communities (Witness, Nyirenda, Mutimukuru-Maravanyika, Matose, Ngwenya & Sibanda, 2023).

Addressing the menace of deforestation in Rivers State requires urgent and concerted action at all levels, from grassroots initiatives to national policy frameworks. Efforts to combat deforestation must prioritise sustainable land use practices, forest conservation, reforestation, and afforestation initiatives. Additionally, addressing underlying drivers of deforestation, such as unsustainable agriculture, infrastructure development, and national demand for commodities like timber, palm oil, and soy, is essential for long-term success. Promoting community-based conservation efforts, strengthening land tenure rights for indigenous peoples and local communities, and fostering partnerships between governments, civil society organisations, and the private sector are critical steps towards achieving sustainable forest management and mitigating the impacts of deforestation (Wallbott & Recio, 2020). Only through collective action and shared responsibility can we effectively address the menace of deforestation and secure a healthier, more resilient future for both people and the environment.

### **Afforestation and its relevance in Rivers State.**

In the face of escalating environmental challenges such as climate change, biodiversity loss, and deforestation, afforestation emerges as a crucial strategy for mitigating the impacts of human activities and restoring balance to ecosystems. Afforestation, the deliberate establishment of forests in areas where they did not previously exist, holds immense relevance in rural communities, offering multifaceted benefits that extend beyond ecological restoration (Mansourian & Berrahmouni, 2021) such as:

1. **Climate Change Mitigation:** Afforestation plays a pivotal role in climate change mitigation by sequestering carbon dioxide from the atmosphere and storing it in trees and soil. As trees grow, they absorb carbon during photosynthesis, effectively acting as carbon sinks. By expanding forest cover through afforestation efforts, we can offset greenhouse gas emissions, enhance carbon sequestration capacity, and contribute to global efforts to combat climate change.
2. **Biodiversity Conservation:** Afforestation helps to create and restore habitats for a diverse array of plant and animal species, thereby promoting biodiversity conservation. Forests are home to a significant proportion of Earth's terrestrial biodiversity, providing shelter, food, and breeding grounds for countless species. Afforestation initiatives that prioritise native tree species and incorporate diverse ecological communities can help to reverse habitat loss, protect endangered species, and safeguard ecosystem services essential for human well-being.
3. **Soil Stabilisation and Erosion Control:** Trees and forests play a crucial role in soil stabilisation and erosion control, helping to prevent soil erosion, retain moisture, and maintain soil fertility. By planting trees in degraded or vulnerable landscapes, afforestation helps to stabilise slopes, reduce runoff, and protect against landslides and flooding. Healthy forests also contribute to groundwater recharge, regulate water cycles, and enhance watershed functions, benefiting both ecosystems and human communities.
4. **Socio-economic Benefits:** Afforestation initiatives offer a range of socio-economic benefits to local communities, including employment opportunities, income generation, and sustainable livelihoods. Forest restoration projects create jobs in tree planting, forest management, and ecosystem restoration, thereby supporting rural economies and empowering marginalised communities. Additionally, forests provide a wide range of ecosystem services that are essential for human well-being, including clean air and water, food and medicine, and cultural and recreational opportunities.
5. **Urban Greening and Health Promotion:** Afforestation plays a critical role in urban greening efforts, helping to enhance the quality of urban environments and improve public health. Urban forests and green spaces provide numerous benefits to urban residents, including air purification, noise reduction, heat

island mitigation, and mental health promotion. By integrating afforestation into urban planning and design, cities can create healthier, more livable environments for their inhabitants (Elkin, 2022).

In Rivers State, characterised by rapid urbanization, industrialisation, and environmental degradation, afforestation emerges as a powerful tool for promoting sustainability, resilience, and well-being. By investing in afforestation initiatives, we can harness the ecological, social, and economic benefits of forests to address pressing environmental challenges, enhance ecosystem resilience, and create a more sustainable future for generations to come.

### **The Need for Environmental Awareness creation towards Strengthening Afforestation in Rivers State.**

In Rivers State, where rapid urbanization, industrialisation, and unsustainable land use practices have led to widespread environmental degradation, there is an urgent need for heightened awareness and action towards afforestation. Environmental awareness serves as a catalyst for meaningful change, empowering individuals, communities, and governments to prioritise the restoration and conservation of forests as a crucial component of sustainable development. Environmental awareness fosters a deeper understanding of the ecological significance of forests and the vital role they play in supporting life on Earth (Mori, Lertzman & Gustafsson, 2017). Forests are not merely collections of trees; they are complex ecosystems teeming with biodiversity, providing habitat for countless species, regulating climate, purifying air and water, and preserving soil fertility. By raising awareness about the intrinsic value of forests, environmental awareness cultivates a sense of reverence and appreciation for these invaluable natural resources.

Environmental awareness also helps to shed light on the myriads of threats facing forests in our communities, from deforestation and habitat destruction to climate change and invasive species. Through education and outreach efforts, individuals gain insight into the root causes of forest loss, including unsustainable logging, agricultural expansion, urban encroachment, and illegal activities. By understanding the drivers of deforestation, people are better equipped to advocate for policies and practices that protect and restore forest ecosystems (Kyere-Boateng & Marek, 2021). It empowers communities to take proactive steps towards afforestation and forest conservation. By providing information, resources, and technical support, awareness-raising initiatives enable local stakeholders to participate in tree planting campaigns, reforestation projects, and sustainable land management practices. Community-based approaches to afforestation not only enhance ecosystem resilience but also foster a sense of ownership and stewardship among those directly affected by environmental degradation.

Environmental awareness encourages individuals to adopt more sustainable lifestyles that minimise their impact on forest ecosystems. By promoting practices such as reducing consumption, recycling, composting, and using eco-friendly products, awareness-raising campaigns empower people to make environmentally conscious choices in their daily lives (Mori, Lertzman & Gustafsson, 2017; Kyere-Boateng & Marek, 2021). Sustainable consumption patterns help alleviate pressure on forests by reducing demand for products derived from deforestation, such as timber, palm oil, and beef. It serves as a catalyst for advocacy and policy change at local, national, and global levels. Informed and engaged citizens can influence decision-makers to enact legislation, regulations, and incentives that promote afforestation, sustainable forest management, and conservation. By amplifying the voices of concerned citizens, environmental awareness campaigns hold governments and corporations accountable for their environmental stewardship and catalyse systemic change towards a more sustainable future.

### **Environmental Awareness creation strategies for Strengthening Afforestation in Rivers State.**

#### **Climate Change Education Strategy**

This is focused on increasing public understanding of the role of trees in climate change mitigation and adaptation. This will be achieved through community tree planting campaigns that emphasised carbon storage and flood control and mass media and social campaigns that disseminated climate information on the importance of afforestation. This strategy will also enable farmers more importantly to understand the essential principles of earth climate system; communicate about climate change in a meaningful way and also able to make informed

and responsible decision with regards to actions that may affect the climate such as deforestation. Therefore, farmers in Rivers State that are into logging need this programme in order to understand the impact of their unhealthy practices that affect the climate system such as deforestation.

### **Conservation Education Strategy**

Conservation means the preservation and careful management of the environment and natural resources. Therefore, conservation education strategy is aimed at promoting the protection and restoration of natural ecosystems. Activities such as mangrove and riparian restoration drives will be used to educate communities especially loggers on biodiversity conservation and the ecological value of mangrove forest in Rivers State. Community tree planting campaigns and school-based programmes can further reinforce the need to conserve native tree species and prevent environmental degradation. People need to know how to conserve local resources such as trees, mangroves and so on. Kaushik in Ezechinnah (2019) asserted that tree planting (afforestation and reforestation) serves as the most effective environmental conservation efforts involving local people.

### **Forestry Education Strategy.**

This strategy emphasises the development of practical knowledge and skills required for sustainable forest management. Through community tree planting campaigns and mangrove restoration activities, participants will be trained on appropriate tree species selection, planting techniques and tree maintenance. This programme is usually organised by the forestry departments in the ministry of Agriculture, forestry departments of higher institutions, Non-Governmental Organisations (NGOs) or even individuals to educate people on skills of managing forest resource sustainably. This is aimed at fostering responsible environmental behaviours towards forest resources like economic trees, wild lives and so on among members of the community.

### **Environmental Literacy Strategy.**

Environmental literacy simply is the process whereby people are exposed to understand issues in their environment in order to develop skills for solving the problems. Roth (1992) describe environmental literacy as a set of understanding, skills, attitudes and habits of man that compels individuals to relate with their environment in a positive way and to take day-to-day and long-term actions to maintain or restore sustainable relationship with other people and their environment. As observed in Eheazu (2010), basic knowledge components is based on the idea that before an individual can act on an environmental problem, he/she must first understand the problem then develop the right attitude and skills that will enable the individual to relate with the environment in positive ways, in order to maintain and restore sustainable relationship with the environment. This strategy will be implemented through mass media and social media campaigns, targeted school and youth programmes and community sensitisation activities designed to communicate environmental messages in simple and locally relevant terms, thereby encouraging informed participants in afforestation efforts. This programme is important as it will create awareness on members of a community on the dangers of deforestation and its effects on their environment and the need to plant trees to restore back their environment.

## **CONCLUSION**

In conclusion, this review emphasises the need of the people of Rivers State in making the initiative of afforestation a reality. With the analysis of forestry ecological value, identifying what puts such resources at risk and mobilising the populace, it is obvious that an environmental concerns is not only a dream, rather an imperative in the face of growing environmental degradation. From understanding the intricate interplay between forests and biodiversity to recognising the complexity of fighting deforestation, this study has articulated the way forward towards sustainable forest management and restoration. By fostering a deeper appreciation for the invaluable services that forests provide, raising awareness about the pressing threats they face, and mobilising collective action at all levels, we can speed up transformative change towards a greener and more resilient future.

In the pursuit of afforestation and forest conservation, environmental awareness emerges as a powerful tool for empowering individuals, communities, and governments to make informed decisions and take meaningful steps

towards sustainability. By nurturing a culture of environmental stewardship grounded in knowledge, empathy, and action, we can unlock the full potential of afforestation as a solution to global environmental challenges and ensure the continued well-being of both man and the environment. As we begin this journey towards a more sustainable future, it is important that we commit ourselves to the cause of environmental awareness and afforestation. By working together with dedication, determination, and shared purpose, we can create a world where forests flourish, biodiversity thrives, and humanity coexists in harmony with nature.

## SUGGESTIONS

Based on the discussions and conclusions of this study, the following suggestions are proposed as actionable steps for addressing the identified challenges of deforestation and forest degradation in Rivers State:

1. The Rivers State Ministry of Education, in collaboration with the Ministry of Environment and relevant environmental agencies, should implement comprehensive environmental education programmes targeted at primary, secondary, and tertiary institutions, as well as local communities and workplaces. These programmes should focus on improving public awareness of the causes, impacts, and long-term consequences of deforestation identified in this study.
2. The Rivers State Ministry of Agriculture and Forestry should, as part of its annual work plan, design and implement community-based afforestation and reforestation projects in deforestation-prone areas. These projects should actively involve local community members, traditional leaders, and youth groups in planning, implementation, and monitoring, in order to address the lack of community participation highlighted in this paper.
3. Policy makers at the state level, particularly within the Rivers State House of Assembly and relevant ministries, should advocate for and develop policies that incentivise afforestation, tree planting, and sustainable forest management practices. This recommendation responds to the study's finding on weak policy support and inadequate incentives for sustainable forest use.
4. Forest regulatory agencies and law enforcement bodies should strengthen the enforcement of existing forest and environmental laws to curb illegal logging, land conversion, and other unsustainable practices identified in the study. This should be supported by improved transparency, accountability, and governance mechanisms in forest management, including clear land tenure systems, proper resource allocation, and effective forest monitoring.
5. The Rivers State Government should facilitate stronger collaboration and partnerships among government agencies, non-governmental organisations, private sector actors, local communities, and international development partners. Such partnerships are necessary to mobilise funding, technical expertise, and institutional support for sustainable forest management and restoration initiatives in the state.

## REFERENCES

1. A. I. (2021). Examining biofuel sustainability as an alternative energy source and implication for food security in Sub-Saharan Africa. *Journal of Critical Reviews*, 8(2), 2209–2225. <https://doi.org/10.31838/jcr.08.02.223>.
2. Bandura, A. (1999). Social cognitive theory of personality. *Handbook of personality*, 2(1), 154-196.
3. Buwani, D. N. (2017). Environmental ethics challenges in the case of Congo basin deforestation: A theological ethical perspective. Master of Theology Dissertation. Pretoria: (University of South Africa).
4. Cruz, M., Pradel, W., Juarez, H., Hualla, V. & Suarez, V. (2023). Deforestation dynamics in Peru. *A comprehensive review of land use*. Centro Internacional de la Papa. 45 p. DOI: 10.4160/cip.2023.12.007.
5. Duguma, L. A., Atela, J., Minang, P. A., Ayana, A. N., Gizachew, B., Nzyoka, J. M. & Bernard, F. (2019). Deforestation and forest degradation as an environmental behavior: Unpacking realities shaping community actions. *Land*, 8(2), 26.
6. Eheazu, C.L. (2010). Environmental literacy levels of Nigerian university students: A study of selected institutions in Nigeria the south-south geopolitical zone. Unpublished Ph.D Thesis, Faculty of Education, University of Port-Harcourt.

7. Elkin, R. S. (2022 Agholor). *Plant life: the entangled politics of afforestation*. University of Minnesota Press.
8. Ezechinnah, C. A. (2019). Environmental adult education programmes as strategies for climate change adaptation by farmers in Rivers State. Unpublished Ph.D Thesis, Faculty of Education, University of Port-Harcourt.
9. Geidam, A. A. & Lukman, Z. M. (2023). Attitude, behavioural intention and its relationship with afforestation program in Nigeria: A proposed framework. *International Journal of Latest Research in Humanities and Social Science (IJLRHSS)*, 06(02), 77-81.
10. Kinda, H. & Thiombiano, N. (2021). The effects of extractive industries rent on deforestation in developing countries. *Resources Policy*, 73, 102203.
11. Kumar, R., Kumar, A. & Saikia, P. (2022). Deforestation and forests degradation impacts on the environment. In *Environmental Degradation: Challenges and Strategies for Mitigation* (pp. 19-46). Cham: Springer International Publishing.
12. Kyere-Boateng, R. & Marek, M. V. (2021). Analysis of the social-ecological causes of deforestation and forest degradation in Ghana: Application of the DPSIR framework. *Forests*, 12(4), 409.
13. Longobardi, P., Montenegro, A., Beltrami, H. & Eby, M. (2016). Deforestation induced climate change: Effects of spatial scale. *PloS One*, 11(4), e0153357.
14. Mansourian, S. & Berrahmouni, N. (2021). *Review of forest and landscape restoration in Africa 2021*. Food & Agriculture Org..
15. Mori, A. S., Lertzman, K. P. & Gustafsson, L. (2017). Biodiversity and ecosystem services in forest ecosystems: a research agenda for applied forest ecology. *Journal of Applied Ecology*, 54(1), 12-27.
16. Olorunsogo, T. O., Ogugua, J. O., Muonde, M., Maduka, C. P. & Omotayo, O. (2024). Environmental factors in public health: A review of global challenges and solutions. *World Journal of Advanced Research and Reviews*, 21(1), 1453-1466.
17. Owoeye, I., Olayide, O. & Njuguna, P. (2019). Assessment of afforestation activities in Embu and Kirinyaga Counties of Kenya. *African Journal of Sustainable Development*, 9(1), 61-84.
18. Reinecke, S. & Blum, M. (2018). Discourses across scales on forest landscape restoration. *Sustainability*, 10(3), 613.
19. Rieckmann, M. (2018). Learning to transform the world: Key competencies in Education for Sustainable Development. *Issues and Trends in Education for Sustainable Development*, 39(1), 39-59.
20. Roth, C. E. (1992). *Environmental Literacy: Its roots, Evolution and Directions in the 1990s*. Columbus, ERIC Clearing house for Science, Mathematics and Environmental Education.
21. Simion, R. (2023). Considering geo-engineering in an ethical biocultural framework. *Studia Universitatis Babeş-Bolyai-Philosophia*, 68(2), 15-32.
22. Srivastav, A. & Srivastav, A. (2019). Natures' reaction to anthropogenic activities. *The Science and Impact of Climate Change*, 79-109.
23. Wallbott, L. & Recio, E. (2020). Practicing human rights across scale: indigenous peoples' affectedness and recognition in REDD+ governance. In: *Affectedness and participation in international institutions*, Routledge, 199-220.
24. Witness, K., Nyirenda, R., Mutimukuru-Maravanyika, T., Matose, F., Ngwenya, M. & Sibanda, L. (2023). Sustaining adaptive collaborative management processes: Challenges and opportunities from Mafungautsi State Forest, Gokwe, Zimbabwe. *Responding to environmental issues through adaptive collaborative management*, 164-193.