



# Impact of deforestation on the achievement of Sustainable Development Goal 13 in selected local government areas of Rivers State

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**Abstract:** The study investigated the Impact of Deforestation on the Achievement of Sustainable Development Goal-13 in selected local government areas of Rivers State. Two research questions guided the study. The study adopted a descriptive survey design. The population comprised 250 members of CBOs drawn from five local government areas- 50 from each LGA, namely: Etche, Ahoada West, Khana, Gokana and Opobo/Nkoro LGAs. The entire population was studied as sample due to its small and manageable size. A questionnaire titled “Deforestation on the Achievement of Sustainable Development Goal 13 Questionnaire” was used for data collection. Cronbach Alpha method was used to test the internal consistency of the instrument which yielded reliability indexes of 0.84 and 0.82. The research questions were answered using mean statistics. The study found out that respondents agreed that deforestation has serious environmental and socio-economic impacts on sustainable rural community development in Rivers State. The study also found out that community members have considerable level of awareness on the impact of deforestation. Based on the findings, it was recommended amongst others that government and its agencies as well as non-governmental organizations should collaborate with rural community leaders in organizing awareness campaigns on the importance of afforestation, reforestation and forest conservation as well the need to observe sustainable environmental practices in rural communities in Rivers State.

**Keywords:** Climate Change, Community Development, Deforestation, Rurality, Sustainable Development.

## 1. INTRODUCTION

The natural environment provides a suitable habitat for the survival of man. It comprises of the dry lands, green vegetation and water bodies- where man lives, feeds and thrives. The environment also extends to the atmosphere which is composed mainly of nitrogen and oxygen, and mildly of carbon dioxide and other gases needed for the survival of man. The environment and man are, therefore, inseparable. Hence, De and De (2015) noted that the environment is the sum total of all conditions and influences that affect the development and life of [man] on earth.



The environment provides the space in which man lives, supplies the water which man drinks, and contains the vegetations from which man harvests foods and other plants needed for medicine and the processing of finished products. One component of this vegetation is the forest body. Lund (2014) defined a forest as an area covered by a collection of trees and shrubs grown either naturally or cultivated by humans, and producing woody materials or any kind of forest yield. A forest is a land area spanning over 0.5 hectares with trees higher than 5 meters and a canopy cover of more than 10 percent, or trees able to reach these thresholds in site. It does not include land that is predominantly under agricultural or urban land use.

Forests are valuable assets anywhere in the world. They provide resources such as timber, food, medicine and also protect the natural environment against global warming, climate change and loss of biodiversity. Their availability is, thus, a condition necessary for human survival (Sakiyo, Musa, & Badgal, 2020). Nigeria ranks amongst the countries with the largest forest area. The country is naturally endowed with vast expanses of forest land—the swamp forest in the southern part of the country, the tropical rainforest in the south-western part, and the wooded savannah in the middle-belt. According to Mfon *et al.* in Sakiyo, Musa and Badgal (2020), forests in Nigeria occupy about 110, 890km<sup>2</sup> of the country's total land mass of about 910,770km<sup>2</sup>. This implies that forests make up 12.18% of the vegetation in the country.

An abundant reserve of these forests is found in the Niger Delta region in southern Nigeria. According to Afolabi in Nyananyo (2019), “about one third of the Niger Delta area is made up of wetlands, and it contains the largest mangrove forest area in the world (5,400 – 6,000 km<sup>2</sup>).” The Niger Delta also contains a large area of fresh water swamp forests and lowland rainforests, thus, making it a great reserve of forest resources. Rivers State is located in the Niger Delta. The State boasts of a population of over 7 million people. Over 3 million of this population are rural dwellers who depend mostly on forest products for their livelihood. They utilize these forest resources for both domestic and industrial purposes.

Forest resources in rural parts of Rivers State are available in different varieties. They range from animals to plants and other non-timber forest products which can be utilized for food production. Most of these forest resources are also put to non-food uses such as fuel, fertilizer, industrial inputs, construction and decorative purposes, medicinal plants, livestock and wildlife. They also include a wide range of ecological and biological components which contribute to biodiversity at multiple levels. Sakiyo, Musa and Badgal (2020) noted that these forest bodies also contribute to the regulation of the global climate and act as major agents of carbon exchange in the atmosphere.

Furthermore, Sunday and Deekor (2019) observed that many rural dwellers in major parts of Rivers State utilize non-timber forest products (NTPF) for household subsistence, economic exchange, cultural practices, spiritual fulfilment as well as physical and emotional well-being. Many of these rural dwellers depend on the extraction of these forest resources as their means of livelihood. There is a high extent of utilization of forest products such as fruits and vegetables, fodder and forages, nuts and seeds, medicinal plants and wild animals among rural dwellers in Rivers State. This is because forest products have been estimated to be of high economic value.

For instance, Irikana and Akujuru (2019) found out that some selected forest products were useful to rural communities in Rivers State and were of high monetary value. These forest products were categorized into wild life animals and wild plants. The forest products identified to be most useful were firewood, honey, tuber logs, snails, wild fruits, wild vegetables, wild mushrooms, wild animals, bamboo and raffia. Valuation of these forest products showed that they had an annual value of N532, 351,300, and an expected value of N865, 648,300. This finding underscores the importance of forest products to the survival of rural communities in Rivers State. As Nyananyo (2019) rightly asserted, “Forest resources are the ultimate expression of the nature of any natural environment and are a major part of man's life support system, being the source of foods, medicines, fuel, shelter and raw materials for industries. Furthermore, man looks up to the genetic variability in forest resources to improve productivity and healthcare.”

However, it has been observed that man's over-dependence on forest products has led to an unsustainable way of exploiting these forest resources. This has resulted in an alarming rate of deforestation. Ugwu and Mbalisi (2016) defined deforestation as the deliberate removal of forest and other forms of vegetative cover from site without replacement. It is the alteration of the natural arrangement of trees, a process of depleting without reforesting the flora and fauna of the area. It is also a process whereby trees are felled for several purposes, but without replanting to replace the ones felled. The main causes of deforestation have been attributed to unsustainable human activities on forest areas including



logging, agriculture, urbanization, industrialization, and population growth (Wajim, 2020; Bodo, Gimah & Seomoni, 2021; Keta, Singh & Joefree, 2022).

In a study carried out in the Western Ghats of India, Kunte and Bhat (2024), for instance, observed that deforestation is a significant contributor to climate change. As millions of hectares of lands are cleared for agriculture and urbanization, it results in great loss of tree cover. Another observation by the International Panel on Climate Change (IPCC) in Kunte and Bhat (2024) showed that deforestation causes up to 10 percent of anthropogenic carbon dioxide emissions which leads to rising global temperatures, a trend which could result in adverse increase or decrease in the rate of rainfall. The authors further noted that climate change induced by increasing temperatures can also cause a decrease in crop production, which could consequently have negative impact on the economy.

Similarly, Opeyemi (2025), in a study on climate change awareness among farmers in Osun State, Nigeria, reported that a majority of the rural dwellers in the area attributed the cause of climate change to deforestation. The resultant effects of this are crop failure, financial loss and food insecurity. Another study by Akue, Gbarabe and Dagogo (2025) indicated that deforestation, among other factors, is a major cause of climate change in Port Harcourt, Rivers State. Buttressing this point, Ullah (2025) avowed that deforestation can pose climate-threatening challenges to the environment, such as increased storm severity, rising landslide frequency, intensified heat, water scarcity and frequent flooding. Dantai and Tadda (2025) corroborated this view when they observed that deforestation, among other human activities, has a negative impact on the environment.

These challenges notwithstanding, Opeyemi (2025) suggested that awareness campaigns on climate change can help rural community members cope with the impact of deforestation on the environment. This was reported in a study which revealed that a majority of rural dwellers, mainly farmers, in Ife South Local Government Area of Osun State acknowledged that they were aware of current changes in the climate and its attendant consequences on the environment. This knowledge, the farmers attested, has enabled them adopt strategies to adapt to climate change and to as well boost their agricultural productivity. Supporting this view, Ullah (2025) acknowledged that awareness campaigns through extension intervention can help shift the mindsets of community members towards more responsible and sustainable environmental practices such as afforestation and conservation.

From the foregoing, it has been sufficiently deduced that forest bodies have both environmental and socio-economic values for man. Therefore, as these rich forest bodies are depleted, the situation does not only put the environment at the risk of extinction, but also throws man into the danger of social and economic survival. People lose their natural habitat and means of livelihood; the environment is depleted due to loss of the vegetation. This degradation of the habitat exposes people to all kinds of respiratory and water-borne diseases, and the development of human communities is terribly threatened. However, despite this observable trend and availability of copious research on deforestation and its impact on the climate, there appears to be scare literature and data on the impact of deforestation on the development of rural communities in Rivers State. This gap in literature and data could have been occasioned by the fact that previous researches on the subject matter had concentrated on the urban parts of the state. It is on this backdrop that the study seeks to investigate the impact of deforestation on the achievement of sustainable development Goal-13 in selected local government areas in Rivers State.

## **2. STATEMENT OF THE PROBLEM**

In Nigeria's Rivers State, deforestation has grown to be a serious environmental and socioeconomic problem for rural populations. Rapid forest destruction for logging, oil exploration, urbanization, and agricultural growth has had detrimental ecological effects, including soil erosion, biodiversity loss, and climate instability. In Rivers State, a large number of rural communities rely on trees for fuelwood, agricultural, and medical purposes. But as the pace of deforestation increases, these resources are getting harder to find, which has a detrimental impact on community well-being, food production, and water availability. Sustainable rural development is seriously threatened by the pace of deforestation, which is increasing despite several legislation and conservation initiatives.

Beyond just harming the environment, deforestation also has an influence on rural communities' social and economic fabric. Decreased agricultural output, a loss of revenue streams, and a rise in rural poverty are all results of the degradation of forest resources. Deforestation has also altered conventional land-use patterns, which has exacerbated disputes over resource and land ownership. Increased health issues, including respiratory disorders brought on by air pollution and waterborne infections as a result of lower water quality, have also been connected to the loss of natural



vegetation. Research on the direct effects of deforestation on sustainable rural community development in Rivers State is scarce, despite these urgent issues. By examining the socioeconomic and environmental effects of deforestation and how it affects the attainment of Sustainable Development Goal 13, or climate action, this study aims to close this knowledge gap.

### 3. RESEARCH QUESTIONS

The following research questions guided the study.

1. What is the environmental impact of deforestation on the achievement of sustainable development Goal-13 in Rivers State?
2. What is the socio-economic impact of deforestation on the achievement of sustainable development Goal-13 in Rivers State?

### 4. METHODOLOGY

The study adopted the descriptive survey design. The population comprised 250 members of CBOs drawn from five local government areas- 50 from each LGA, namely: Etche, Ahoada West, Khana, Gokana and Opobo/Nkoro LGAs. The entire population was studied as sample due to its small and manageable size. A questionnaire titled “Deforestation on the Achievement of Sustainable Development Goal 13 Questionnaire (DASDGQ)” was used for data collection. Cronbach Alpha method was used to test the internal consistency of the instrument which yielded reliability indexes of 0.84 and 0.82. The data collected were analyzed using weighted mean statistics.

### 5. RESULT

**Research Question 1:** What is the environmental impact of deforestation on the achievement of sustainable development goal 13 in Rivers State?

**Table 5.1: Mean Responses of Community Members on the Environmental Impact of Deforestation on the Achievement of Sustainable Development Goal 13 in Rivers State**

S/N	Items	SA	A	D	SD	Total	Mean	Remark
1.	We witness heavy flooding in our community.	241 (964)	9 (27)	0 (0)	0 (0)	250 (991)	3.96	Agree
2.	Soil in our area washes away easily.	233 (932)	17 (51)	0 (0)	0 (0)	250 (983)	3.93	Agree
3.	The weather is now hotter.	215 (860)	35 (105)	0 (0)	0 (0)	250 (965)	3.86	Agree
4.	Farms do not produce enough food.	221 (884)	29 (87)	0 (0)	0 (0)	250 (971)	3.88	Agree
5.	Water from streams and wells has reduced.	218 (872)	32 (96)	0 (0)	0 (0)	250 (968)	3.87	Agree
6.	Many animals and plants have disappeared.	213 (852)	37 (111)	0 (0)	0 (0)	250 (963)	3.85	Agree
7.	Our community suffers more from too much sun and little rain.	227 (908)	23 (69)	0 (0)	0 (0)	250 (977)	3.90	Agree
8.	Dust and smoke in the air have increased.	244 (976)	6 (18)	0 (0)	0 (0)	250 (994)	3.98	Disagree
9.	People in my community know that cutting trees damages the environment.	219 (876)	31 (93)	0 (0)	0 (0)	250 (969)	3.88	Agree
10.	Planting more trees will help our village grow better and protect the environment.	151 (604)	91 (273)	5 (10)	3 (3)	250 (890)	3.56	Agree
	<b>Grand Mean</b>						<b>3.87</b>	<b>Agree</b>

Source: Field Survey, 2025



Table 1 shows the mean responses of community members on the environmental impact of deforestation on the achievement of sustainable development goal 13 in Rivers State. With the grand mean of 3.87 the table indicates that a majority of the respondents agree that deforestation has serious environmental impact on the achievement of sustainable development Goal-13 in Rivers State.

**Research Question 2:** What is the socio-economic impact of deforestation on the achievement of sustainable development Goal-13 in Rivers State?

**Table 5.2: Mean Responses of Community Members on the Socio-economic Impact of Deforestation on the Achievement of Sustainable Development Goal 13 in Rivers State.**

S/N	Item	SA	A	D	SD	Total	Mean	Remark
11.	The amount of food produced in our community has reduced.	239 (956)	11 (33)	0 (0)	0 (0)	250 (989)	3.96	Agree
12.	It has become harder for us to find firewood and herbs.	217 (868)	33 (99)	0 (0)	0 (0)	250 (967)	3.87	Agree
13.	The loss of forests has caused many young people to leave our villages.	221 (884)	29 (87)	0 (0)	0 (0)	250 (971)	3.88	Agree
14.	It harder for families to earn a living.	219 (876)	31 (93)	0 (0)	0 (0)	250 (969)	3.88	Agree
15.	Health problems such as respiratory diseases and heat stress have increased.	227 (908)	23 (69)	0 (0)	0 (0)	250 (977)	3.91	Agree
16.	It is now harder for farmers to predict planting seasons.	243 (972)	7 (21)	0 (0)	0 (0)	250 (993)	3.97	Agree
17.	Our community now experiences stronger and more dangerous storms.	242 (968)	8 (24)	0 (0)	0 (0)	250 (992)	3.97	Agree
18.	Without trees, strong winds now destroy homes and farmlands more easily.	235 (940)	15 (45)	0 (0)	0 (0)	250 (985)	3.94	Agree
19.	People now spend more money repairing their homes after floods or strong winds.	231 (924)	19 (57)	0 (0)	0 (0)	250 (981)	3.92	Agree
20.	Protecting trees can help reduce the effects of climate change in our area.	224 (896)	26 (78)	0 (0)	0 (0)	250 (974)	3.90	Agree
	<b>Grand Mean</b>						<b>3.92</b>	<b>Agree</b>

**Source:** Field Survey, 2025

Table 2 shows the mean responses of community members on the socio-economic impact of deforestation on the achievement of sustainable development goal 13 in Rivers State. With the grand mean of 3.92, the table indicates that a majority of the respondents agree that deforestation has serious socio-economic impact on the achievement of sustainable development goal 13 in Rivers State.

## 6. DISCUSSION

Findings in table 1 revealed that deforestation has serious environmental impact on the achievement of sustainable development Goal-13 in Rivers State. The findings show that heavy flooding, soil erosion, hotter weather, decreased farm yield, reduced water sources, disappearance of many animals and plants, too much sun and little rain, as well as dust and smoke in the air, are the environmental impact of deforestation. This finding acknowledges the fact that climate change is one of the impacts of deforestation. The finding agrees with the findings of Kunte and Bhat (2024) that deforestation is a significant contributor to climate change. The finding also corroborates the findings of Ullah (2025)





that deforestation can pose climate-threatening challenges to the environment. This is in line with the findings of Akue, Gbarabe and Dagogo (2025) that deforestation, among other factors, is a major cause of climate change. The finding also revealed that people in the communities know that cutting trees damages the environment. This implies that there is considerable level of awareness among community members on the impact of deforestation. It means that such awareness can enable community members take action towards sustainable environmental practices. This finding is in line with the findings of Opeyemi (2025) that awareness campaigns on climate change can help rural communities cope with the impact of deforestation. The finding is also in agreement with the findings of Barisitom and Kobani (2023) that educational interventions such as forest education and climate change education programmes can help promote sustainable environments.

Findings in table 2 revealed that deforestation has serious socio-economic impact on the achievement of sustainable development Goal-13 in Rivers State. The findings show that reduced production of food, difficulty in finding firewood and herbs, migration of youths from the villages, difficulty in earning a living, health problems, difficulty in predicting planting seasons, stronger and more dangerous storms, destruction of homes and farmlands, spending of money to repair homes after flood and strong winds, are the socio-economic impact of deforestation. This implies that deforestation has serious impact on the social and economic life of the people. This finding agrees with the findings of Opeyemi (2025) that deforestation has severe socio-economic consequences on communities, which include crop failure, financial loss and food insecurity. This finding is in line with the findings of Ullah (2025), Wajim (2020) as well as Dantai and Tadda (2025) that deforestation can have negative socio-economic consequences on the life of a people.

Findings in both table 1 and table 2 further revealed that the community members agreed that the planting of trees and protection of trees will help their communities grow better and help reduce the effects of climate change in their environment. This means that the community members are aware of the importance of sustainable environmental practices. This awareness could have been the result of previous climate change awareness campaigns carried out in the communities. The implication of such awareness is that community members can be easily mobilized to engage in sustainable environmental practices such as afforestation and conservation, which can help them build resilience in the face of climate change. This finding is in line with the findings of Ullah (2025) that afforestation and forest conservation are sustainable ways of protecting the environment against the impact of climate change. The finding also corroborates the findings of Kunte and Bhat (2024) that afforestation creates a potential for protecting the natural environment.

## 7. CONCLUSION

Based on the findings of this study, it was concluded that deforestation has both environmental and socio-economic impacts on the achievement of sustainable development goal 13 in Rivers State. However, community members have knowledge of these impacts, hence they can be mobilized towards sustainable environmental practices if given the right awareness and opportunity.

## 8. RECOMMENDATIONS

Based on the findings, the following recommendations were made:

1. Government and its agencies, as well as non-governmental organizations, should collaborate with rural community leaders in increasing the awareness of rural communities on the impact of deforestation and the need to take decisive actions.
2. Government, non-governmental organizations and community leaders should encourage sustainable environmental practices such as afforestation and forest conservation among rural communities in Rivers State.

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