Innovations

Environmental degradation and sustainability in Isoko north and south, Delta state, Nigeria: the deforestation factors

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Abstract

The major priority of the global community is to ensure the sustainability of a healthy and living earth. In order to achieve a functional living earth, the forest eco-system should constitute a major factor for environmental sustainability. This is because of its role in maintaining ecological stability. To this effect, this study examines the theme, environmental degradation and sustainability in Isoko North and South, Delta State, Nigeria: the deforestation factors. Based on computed F-value obtained from the regression equation, the f cal is 23.818 is greater than the critical t-value of 2.25 at 0.05 level of significance. Consequently the null hypothesis was rejected and the alternative hypothesis accepted, which confirms a significant effect on deforestation based on variables examined which includes bush burning, arable farming, population, logging, crude oil exploration, sand dredging and firewood collection. The study also indicated that deforestation affects flora resources than on the fauna. The study therefore recommends that green area conservation and preservation should be implemented to ensure that environmental sustainability through adequate forest/ vegetal resources management takes precedence over degradation, in order to avert or mitigate negative consequences of deforestation on the environment.

Keywords: *1.Environmental degradation, 2.Sustainability, 3.Deforestation, 4.Factor, 5.Isoko, 6.Delta State, 7.Nigeria*

1.0 Introduction

Man depends on nature as well as reliesabsolutely on nature's abundant supply of natural resources. One of the most valuable resources of nature especially in the tropical rainforest belt of Nigeria is the forest vegetation. Over the years, deforestation of the forest in Isoko North and South has become and emergent issue of notable concern. The environmental menace of deforestation is further compounded based on the allusion that the locational advantage of the area of long duration of rainfall, sunshine, temperature and rich organic forest could be seen as an added advantage to sustainable forest vegetation. Rabiu et al (2020) however noted that this even makes deforestation more precarious in the forest region. This is due to the apathy of natural forest regeneration without deliberate efforts to replace trees in a sustainable manner.

Tombori, Batobari and Kemafoyen (2021) opined that deforestation and environmental degradation have quickened forcefully in the course of the last two centuries and particularly over the most recent few years. Rabiu et al (2020) also corroborated the views that the major drivers of deforestation and destruction are usually the outcome of anthropogenic activities of man, which directly impinges on the quality of the environment through the loss of carbon stocks.Gbiri and Adeoye (2019) also attributedagricultural activity to be the leading driver of deforestation in the Niger Delta region accounting for about 80% of deforestation at both the local and global scale.

In the 21st century, one of the major priorities of the entire human race is to ensure that sustainable and healthy living earth is achieved by minimizing harmful practices that are capable of degrading the earth. Rene et al (2021) remarked that unless the course of the recent day civilization is altered, man could be seen to be in a rendezvous of global disaster considering the reckless attitude of man towards the environment. These authors noted that the deforestation of Amazon forest whose deforestation scale is now attracting global concern started from such operations of deforestation through anthropogenic activities such as indiscriminate bush fires, arable farming activities, logging fire wood collection, population pressure, urbanization, grazing and oil exploration. Cunningham and Cunningham (2006) identified deforestation as a major threat to preservation and conservation of resources and also added that poverty is one of the major drivers of environmental degradation, stating that lack of basic means of livelihood, compels disenfranchised citizens to allow immediate survival to take precedence over long term environmental goals. This is against the backdrop of the sustainable development agenda as enumerated by the Sustainable Development Goals (SDGs), (FOA: 2015).

The import of such human action is that preservation and conservation will not be accorded the attention they deserve in the sustainable development agenda, as also emphasis by Rene et al (2021). Mfon et al (2014) opined that deforestation in Nigeria accounts for 3.5% decline of species also in a related study, Mark (2003) enunciated a number of environmental hazards that are associated with deforestation. Derouin (2022) also opined that the causes and effects of deforestation have negative effects on the environment. FAO (2015), asserted that the environment is becoming more fragile as a result of rapid environmental degradation through, deforestation there is therefore need to gear up environmental preservation and conservation strategies. Especially in an era of Ozone layer depletion, wherein land cover transformation is a major contributor to environmental degradation through the actions of man, considering the harmful impact of Ozone layer depletion on the biosphere, the ecosphere and the flora and fauna therein. Isoko North and South by virtue of location belongs to the rainforest region of the Niger Delta, however in recent times, what now exist are vestiges of the primary forests which now exist as forest landscapes in their secondary succession stage, and harnessing forest resources of the study area has continued unabated.

This study therefore seeks to address the major factors that act as drivers to deforestation in Isoko North and South, Delta state Nigeria to safeguard the forest environment for the present and posterity, drawing cautions from the current state of the Amazon rainforest which is the most preserved tropical rainforest on earth as opined by Rene et al (2021). In line with this opinion, UNEP (2020) advocated protection of plants and biodiversity of the environment for sustainable development in order to remediate reckless anthropomorphic activities. FAO (2015), noted that in order to stem the tide deforestation urgent actions must be taken to address, the divers effects and major consequences of deforestation. United Nations Organisation (UNO, 2015) aptly captured forest conservation and land cover transformation in the sustainable development goals.

2.0 Conceptual Clarification

As conceptualized by Mfon et al (2014), three major schools of thoughts are associated with deforestation and its causes. They are:

2.1 Impoverishment school – This school of thought of deforestation implies that deforestation is poverty induced. The school of thought was corroborated by Gbiri et al (2019) stating that the problems of many developing nations of the world is the presence of too many poverty stricken people who put excessive pressure on the natural resources of the environment. It is usually opined that their immediate needs are too pressing for them to consider the future. At this low ebb of living, they cannot afford to be involved in conscious forestry management techniques. This eventually leads to individuals and communities participation in indiscriminate forest destruction through logging, fire wood collection and other destructive and extractive activities. These practices eventually deplete the forest resources of the environment which leads to environmental degradation, without recourse to environmental sustainability. From this school of thought, it suffices to state that poverty induces a vicious circle of degradation of forestry resources and natural resources in general.

2.2 Neoclassical group: The neoclassical group believes that deforestation is caused by open access property rights. The implication of this thought is that the environment is important for economic activities and these economic activities have also have impact on nature. Hardin (1968) asserts that within the framework of the neoclassical group, the over use of vegetal natural resource is seen on one hand as the consequence of a lack of well defined property rights, as a result of which renewable and non-renewable resources become readily available to resource users. Hardin refers to this as "the tragedy of commons". This simply implies that such open access to property rights will give rise to indiscriminate destructive practices on vegetal resources and other resources of the environment. He further remarked that such freedom of accessibility to resources with little or zero moderation will lead to a multiplicity of factors that bring about deforestation

2.3 Political ecology school- This group is generally concerned with justification and explanations on why humans are transforming nature through deforeatation and other human activities that brings about environmental modification. It is generally believed that capitalists ane entrepreneurs in quest for more land for expansion put pressure on the forest resources without recourse to the implication or consequences on the environment. The general assumption on this school of thought as opined by Batter bury (2018), attests that right to natural resources are vital for welfare and livelihood, and that gender, class, ethnicity, political status and other vectors of power influence patterns of ownership and resource control. This school of thought to deforestation further explained that natural resource utilization is a function of how production and economic accumulation strategies occur, which in turn influences differences in environmental responses.

3.0 Study Area 0

The main focus of the study is on Isoko North and Isoko South, although both Local Governments existed as a single Local Government before the creation of Delta state in 1991.Isoko is made up of Isoko North and South and is located within the Niger Delta region of Nigeria. It lies within latitude 5^0 15^1 and 5^0 4^1 North of the equator and between longitude 6^0 15^1 East of the Greenwich Meridian. Isokoland has an area of about 1,097.1 Sq Km. to the North, the area is bounded by Ndokwa, to the East by Ase creek, to the West by Urhobo and South by Ijo. It is a low lying area of about 20 metres above the sea level of the lower Niger Delta, which lies on the low undulating terrain. (see Figs 1 and 2).

3.1 **Vegetation**- Isokolies within the tropical rainforest vegetation belt of the Niger Delta region, Nigeria. Prior to the advent of massive forest destruction to sustain livelihood of inhabitants of the area, the area flourished with diverse and lush species of both hardwood and softwood which includes Ebony, Iroko, Mahogany, Obeche, Opepe and others. As a result of anthropogenic disturbances, the characteristic lowland rainforest and fresh water swamp vegetation have been distorted. What is left is the vestiges of the original vegetation belt (Edewor and Atubi, 2021a).

3.2 Climate- the climate of the area is a reflection of its Latitudinal location and prevailing wind systems. The two major wind systems that influence the climate of the area are the North East winds that blow from the North across the Sahara desert between the months of November to March. This brings about harmattan while the warm moisture laden South-West wind that blows from the Atlantic ocean brings about wet season from April to October. The area experiences two distinct climatic seasons with a minimum temperature range of 25^0 C and 28^0C (Edewor and Atubi, 2021b).

Isokoland climatic condition is not an exception on the issues of global climatic change. In recent times, minor distortions of either prolonged rainfall or delayed rainfall regime takes place after the dry season. The wet season is usually interrupted by a brief dry spell which is referred to as August break.

3.3 Drainage- Isokohas two distinguished drainage features which are the Bethel and Owhe swamp systems. They run roughly through North-North East (NNE) and South-South West (SSW) (Oreware:1989). The major water bodies in the area are rain fed rivers and streams, the Ase creek and the Owodokpokpo Umeh creek are both tributaries of the lower Niger. During the wet season, the volume of water in the streams increase dramatically, causing occurrence of flooding in the adjourning flooding planes. This has destructive effects towards the achievement of a sustainable environment and laudable environmental sustainability (Edewor, 2021).

3.4 Human Activities- wherever people are congregated as a settlement region, diverse activities usually takes place. This is to sustain the livelihood of the population. Isoko evolved from an agrarian economy to the present day mechanized society from simple farming and trading ventures. There have been large scale agriculture, logging and sand dredging. All these activities results to human induced environmental transformation.

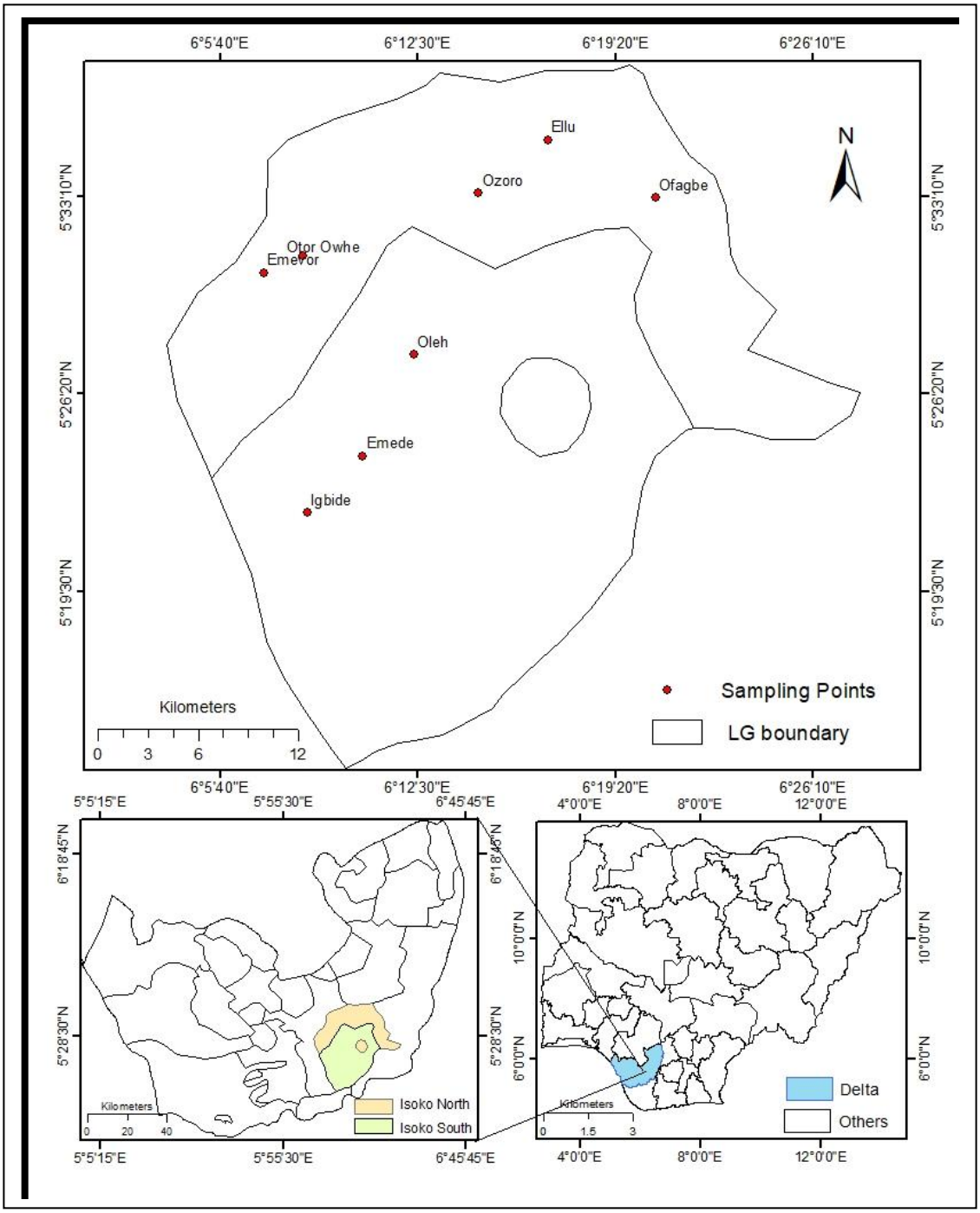

Fig.1, Delta State Showing Study Area
Source- Author's Field work 2021

4.0Materials and Methods

This study is purely based on field study and field observation. The major instrument used for data collection is a well structured open ended questionnaire, supported with photographic images. Five major communities

which are emerging urban centres in the area where purposefully selected in the study area with a view to capture the main essence of the target population for the study. (see Table 1 and Fig. 1).

4.1 Zones Delimitation

Table1. Delimited Communities for the study

A	Ozoro	Isoko North
B	Oleh	Isoko South
C	Ellu/Ofagbe	Isoko North
D	Emede/Igbide	Isoko South
E	Owhe/Emevor	Isoko North

Source- Fieldwork (2021)

The sample size of the questionnaire was 550 and a total of 110 questionnaires were distributed in each zone. Administration of questionnaire was to household heads. On retrieval, void or incomplete questionnaire were eliminated before final data analysis and a total of 424 questionnaire were retrieved. The statistical analysis used is the multiple regression analysis at 0.05 level of significance (P.Sig) with the null hypothesis tested stating that "there is no significant effect on deforestation and causative factors of deforestation". It also examined the impact of deforestation on flora and fauna. (See plates 1-3).

Plate 1, Bush burning at Ellu (Isoko North)
Source- Author's Fieldwork, 2021

Plate 2. Oil spill site at Ozoro (Isoko North)
Source- Author's Fieldwork, 2021

Fig. 5, Sand dredging at Oleh / Ozoro roundabout (Isoko South)
Source- Author's Fieldwork, 2021

5.0 Discussion of Results/ Findings

Table 2,Factors Responsible for Deforestation of the Study Area

Causes of Deforestation	Number of Respondents	% of Respondents
Bush burning	121	28.5
Arable farming	105	24.8
Population	73	17.3
Logging	46	10.8
Crude oil exploration/ Exploration	41	9.4
Sand Dredging	24	5.8
Firewood collection	14	3.4
Total	424	100

Source: Field work 2021

Table 2 shows the results of the field survey of the factors responsible for deforestation in the study area. The survey indicates that bush burning, arable farming, population, logging, crude oil exploration, sand dredgingand fire wood collection are the major factors responsible for deforestation in the study area.

5.1 Factors Responsible for Deforestation in the study Area

Table 3, Contributory factors to deforestation

Model	R	R Square	Adjusted R Square	Std error of the estimate
1	.503[a]	.253	.242	2.0159

Predictors: (Constant), Sand dredging, (00008), Bush burning (00004), Firewood collection (00005), Arable farming (00002), Oil exploration (00003), Logging (00006), population (00007).
Source, Results of Multiple Regression from Author's fieldwork2021

The regression analysis result as indicated by R^2 =(.253) shows that all the seven independent variables on the effects of deforestation, that is, arable farming, crude oil exploration, logging, population, sand grudging and firewood collection accounted for only 25% variation. On the basis of the computed f-value obtained for the regression equation, the calculated f-value of 23.818 was higher than the critical t-value of 2.25 obtained at the 0.05 level of significance. Hence there is a significant effect on deforestation in the study area.

Table 4,Contribution of each of the factors responsible for deforestation

Model	Standardized Coefficient B	Std Error	Standardized Coefficient Beta	T	Sig.
1 (constant)	-8.325	1.035		-8.045	.000
Arable farming (00002)	.759	.163	.189	4.665	.000
Bush burning(00003)	.766	.160	.199	4.791	.000
Oil Exploration (00004)	.620	.172	.144	3.599	.000
Firewood collection (00005)	4.518E – 02	.048	.037	.942	.347
Sand Dredging (00006)	.428	.179	.100	2.384	.018
Population(00007)	.362	.141	.114	2.559	.11
Logging (00008)	.494	.141	.152	3.508	.000

Source- Field study (2021)

Table 4, shows the following values for each of the factors: Arable farming (4.67), Bush burning (4.8). Firewood collection (0.94), Oil exploration (3.6), Logging (3.51), Population (2.56) and Sand dredging (2.4). All the calculated f-values are higher than the critical t-values. Thus it shows that there is significant relationship between arable farming, bush burning, logging, sand dredging, population, logging and oil exploration activities. The following specific factors of bush burning, arable farming, population and logging were found to have higher significant influence on deforestation in the study area.

From the results of the field survey and data analysis, it is obvious that there is outright environmental degradation through indiscriminate deforestation in the study area. Therefore all the listed 7 independent variables have effects on deforestation. The study also reveals that the impact of deforestation is more evident on flora.

6.0 Policy Implication

Having examined the factors that contributes significantly to deforestation in the study area, there is need to design a framework for environmental protection and sustainability in the area with a view to mitigating as well as ameliorating the cause of deforestation and their hazardous consequences. Also, the array of literature

consulted during the course of this study indicate that the consequences of deforestation are beyond deforestation itself since they generate environmental hazards such as flooding, Ozone depletion/ climate change, erosion and soil depletion, flooding, silting up of water bodies such as lakes and streams,extinction of plant species carbon conflicts and other green house gases effects.Therefore, the results should generate healthy environment policies that would checkmate activities such as indiscriminate logging, uncontrolled farming activities, logging, sand dredging and other anthropogenic disturbances that would aggravate or accelerate environmental hazards from deforestation.

7.0 Conclusion

The study established that the following factors namely farming, sand dredging, oil exploration, fire wood collection, bush burning an logging contribute significantly to the occurrence of deforestation in Isoko North and South. It is therefore recommended that effective environmental monitoring at all levels of government should be embarked upon with a view to checkmating activities of individuals and corporate organizations involved in indiscriminate and reckless destruction of forests resources. This should be through proactive measures such as ecosystem recovery and restoration in terms of tree planting and enactment of forest conservation laws as well as penalties for indiscriminate logging. Also, consciousness of forestry and forest guards should be reawakened to their responsibilities in order to give early alerts on the activities of illegal loggers as advocated by NEST (1992).

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