



Advances in Research

17(5): 1-10, 2018; Article no.AIR.42604
ISSN: 2348-0394, NLM ID: 101666096

Perception of the Status of Iko-Esai Community Forest, Akamkpa Local Government, Cross River State, Nigeria

Atim Ayuk Nchor¹ and Sijeh Agbor Asuk^{1*}

¹*Department of Forestry and Wildlife Resources Management, University of Calabar, P.M.B. 1115 Calabar, Cross River State, Nigeria.*

Authors' contributions

This work was carried out in collaboration between both authors. Author AAN designed the study, performed the statistical analysis, wrote the protocol and wrote the first draft of the manuscript. Author SAA managed the analyses of the study. Author SAA managed the literature searches. Both authors read and approved the final manuscript.

Article Information

DOI: 10.9734/AIR/2018/42604

Editor(s):

(1) Dr. Md. Rezaul Karim, Assistant Professor, Department of Agricultural Extension, Hajee Mohammad Danesh Science and Technology University, Bangladesh.

Reviewers:

(1) Manoel Fernando Demétrio, Brazil.

(2) Adalalu Tope Gabriel, Taraba State University, Nigeria.

(3) Christine Wulandari, The University of Lampung, Indonesia.

Complete Peer review History: <http://www.sciencedomain.org/review-history/27811>

Original Research Article

Received 06 June 2018
Accepted 08 November 2018
Published 17 December 2018

ABSTRACT

Efforts have been made by some communities towards conserving their forest, but deforestation still poses serious problems. Despite efforts to conserve community forest, increasing dependence on the forest is bound to shrink the forest continuously. Thus, findings from the study will strengthen the community's initiative towards conservation and sustainable management of their forest and provide baseline information for future studies in the study area. The study assessed indigenes perception on the status of Iko Esai Community forest in Akamkpa Local Government Area, Cross River State Nigeria. All four wards of the community were purposively selected for the study. Structured questionnaires were administered to 160 respondents for data collection. Data were analysed using descriptive (table and charts) and inferential statistics with chi-square analysis to test for independence or association at 5% level of significance. The results showed that there was significant ($P = .0001$) change in the status of the forest from the primary closed forest (69.37%) to

*Corresponding author: E-mail: sijehasuk@gmail.com;

the primary open forest (71.87%). The major signals of deforestation in the forest included loss of wildlife (63.1%), increase in temperature (57.5%), climate (65.6%) and low rainfall (56.3%). Anthropogenic activities (60%) were considered as the major driver of deforestation with economic factors (48%) topping the list of categories of these drivers. Agriculture (64.38%) was perceived as the major factor causing loss of forest in the community. The general opinion of respondents considered the provision of alternative livelihoods for the local people supported by the development of the vast ecotourism assets that abound in the community. Therefore, the effort of NGOs should be intensified to promote conservation and increase awareness of the dangers of deforestation in the area. Agroforestry should also be incorporated into the agricultural practice for sustainable management of the forest. Afforestation programmes should be carried out to revive the lost community forest in the area.

Keywords: Perception; awareness; community forest; anthropogenic; drivers of deforestation; state of deforestation.

1. INTRODUCTION

The continuous dependence of about 1.6 billion people on forest land and forest resources for agriculture, settlements, mining, industrial expansion, fuelwood supply, urban growth, high way construction and other uses has led to massive deforestation [1]. Less than 4,033,060,000 hectares of the earth surface is covered by forests, a drastic deviation from earlier reports which estimate the global forest cover to be approximately six billion hectares [2]. Thus, the level of tropical rainforest destruction is escalating worldwide due to various unfavourable forest practices [3,4].

Anthropogenic activities such as logging for timber, demand for fuelwood, overgrazing by animals, bush burning and unsustainable farming practices by communities settled within and around the forest has resulted in a significant decline in Nigeria's forest resources [5]. Furthermore, Ogugbuaja and Barsisa [6] reported that the indiscriminate burning of forest also degrades the air quality through the release of airborne Suspended Particulate Matter (SPM). These dust when deposited on the leaves of the plants affect the diffusion of water into and out of the plant leaves, a situation which affects the growth of plant species. Thus, reports from FAO [4] revealed that the forest area of Nigeria has continuously declined from about 13,137,000 hectares in 1990 to 13,137,000 hectares in 2000 to 9,041,000 hectares in 2010 and 6,993,000 hectares in 2015.

Cross River State which covers an area of 21,560 km² (about three percent of the landmass of Nigeria) [7] has not been left out of the effects of deforestation. There has been a decline in her forest area from an initial area of about 14,724

km² to about 6,102 km² [8]. Due to the lack of polity will/commitment towards sustainable forest management in the State vis-à-vis the growing dependence on forest resources, the forest area of the State is expected to decrease further. Currently, deforestation is estimated to be at a rate of 3.50 percent to four percent per annum with Ogun, Ondo, Edo, Delta, Taraba and Cross River State having the highest rates of deforestation [8,9]. If drastic measures are not taken there would be critical deterioration of the forest and forest resources in these states. This will entail the loss of food resources as well as the destruction of wildlife habitats which threaten the existence of wildlife species [10].

Community forestry is a forest management strategy which focuses on the participation of local communities in forest and forest resources management and the sustainable utilisation of the forest resources for their daily needs such as food, income, employment, timber and other uses [11]. Community forestry entails the empowerment of the local people and other stakeholders to control and be actively involved in decision-making geared towards the management of the natural biological diversity surrounding their community [11].

Some communities like Iko Esai, Ekuri and a few others in Akamkpa Local Government Area of Cross River State, Nigeria have developed strategies to conserve their community forests thus reducing the continuous loss of their forest. There has been immense support from the Center for Education Research and Conservation of Primate and Nature (CERCOPAN) as well as the State Government towards the encouragement of community forestry in Iko Esai. This has led to the conservation of Iko Esai community forest and its associated flora and

fauna species. Furthermore, with this assistance, the community has been able to develop its forest into an ecotourism hot spot for visitor's appreciation [12,13].

Despite the efforts by CERCOPAN to assist in the conservation of the community forest in the study area, there is bound to be some level of conversion of forest to arable land for food production, extraction of timber and other non-timber forest products. Irrespective of the indigene's willingness to conserve the forests, these activities tend to reduce the forest of the area over time. Therefore, the aim of the study is to assess the perception of indigenes on the status of the forest in the study area, the perceived drivers of deforestation and perceived state of deforestation in the study area. Findings from the study will assist the community in strengthening their initiative towards conservation and sustainable management of their forest. It will also serve as baseline information to aid future studies in the study area.

2. MATERIALS AND METHODS

2.1 Study Area

This research was carried out in Iko Esai Community in Akamkpa Local Government Area,

Cross River State, Nigeria geographically located between latitude 4°37'32" North and 5°43'09" North and longitude 8°11'57" East and 8°20'12" East [14] (Fig. 1). The community with an estimated population of 2,693 people, covers a land area of about 21,000 hectares, is made up of four wards; Eyeyeng, Okoyong, Bukuri and Esereset [12]. Iko Esai community is bounded by Iko Ekperem, New Ekuri and Agoi communities in Akamkpa Local Government Areas of Cross River State. The area is characterized by high rainfall mean annual of 3,000 mm and a dry season that last for up to four (4) months from December to March [12,14]. The temperature of the area ranges from 23 to 37°C with a relative humidity of 90 to 100% in the rainy season and 70 to 80% in the dry season [12,14].

The vegetation of Iko Esai Community is characterised as a moist tropical lowland forest still in its natural state. The community possesses about 12,000 hectares of community forest, jointly managed by the community and CERCOPAN. This includes 400 hectares carved out as a core area for intensive biodiversity protection, 4000 hectares as research area co-managed by CERCOPAN and the community and 3000 hectares as farmlands (Fig. 2). The soil is deep, well drained and contains high humus content making it suitable for agriculture [14].

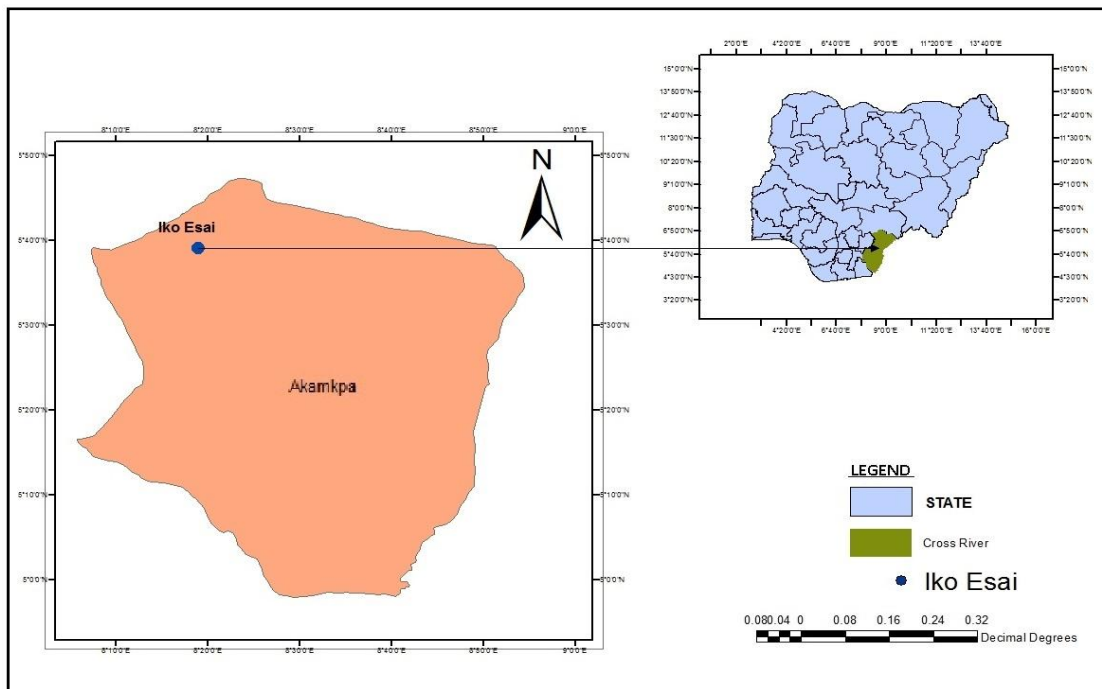


Fig. 1. Akamkpa local government area in cross river state showing Iko Esai

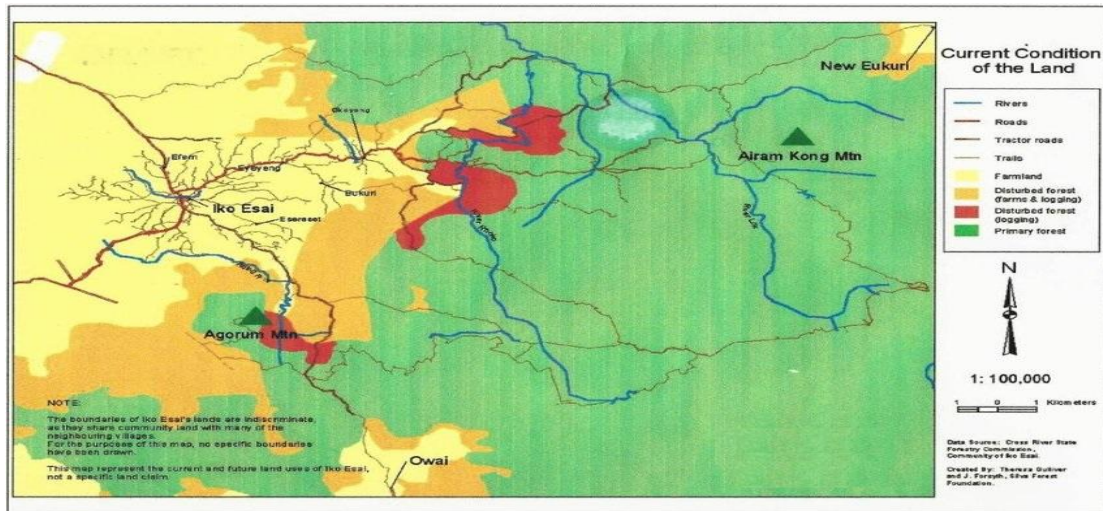


Fig. 2. Land use map of Iko Esai community

There is a high presence of indigenous flora and fauna species in the area including numerous genera and species of butterflies, mammals, birds, reptiles, amphibians and plants some of which are endemic [11]. Primate species in the area include small primates such as galagos and Potos, medium size monkeys of the genus *Cercopithecus* and *Cercocercus* and some large primates like chimpanzees and lowland gorillas. In addition, there is also a presence of a wide variety of ungulates species like duikers as well as golden cats, elephants, buffalos, countless species of birds and numerous butterfly species.

Center of Education, Research and Conservation of Primates and Nature (CERCOPAN) is a UK registered environmental conservation charity and a founding member of the PAN African Sanctuary Alliance (PASA) a US charitable organisation. CERCOPAN strives to conserve tropical community forests and to protect its monkeys while providing education and practical options for the local communities to enable sustainable rather than destructive dependence on the forest. CERCOPAN has been present in the study area since 2006. Since then, they have aided the community in conserving their flora and fauna species as well as designing and developing ecotourism services such as a one hectare Mangabey enclosure, housing facilities for tourist and other leisure sites [12,14].

2.2 Method of Data Collection

All four (4) wards in the community were purposively selected for the study. With sampling

intensity of 5% of the total population, 160 respondents were selected for the study conducted in 2013. These respondents were equally distributed within the wards with each ward having a total of 40 respondents. One hundred and sixty structured questionnaires were administered to the selected respondents as a means of data collection. The questionnaires were structured based on how the local people perceived their forest and forest type as conceived by Kursar et al. [15] using four forest categories described by UNEP [16]. These categories included primary closed forest, primary opened forest, secondary closed forest, and secondary opened forest.

2.3 Data Analysis Techniques

The data collected from the study were subjected to descriptive and inferential statistical analysis. While some data were analysed using frequency tables and charts, others were analysed using chi-square analysis in STATVIEW version 5 to test for independence or association at a five percent (5%) level of significance.

3. RESULTS

Findings from the study are presented in Tables and Figures described below.

3.1 Demographic Profile of Respondents

Table 1 shows the demographic profile of the respondents.

Table 1. Demographic characteristics of respondents

Variable	Frequency	Percentages
Gender		
Male	102	63.75
Female	58	36.25
Age		
16-20 years	5	3.13
21-30 years	51	31.87
31-40 years	44	27.50
41-50 years	46	28.75
Above 51 years	14	8.75
Occupation		
Farming	68	42.50
Trading	5	3.13
Hunting	7	4.37
Civil Servant	5	3.13
Motorcycle drivers	9	5.62
Students	59	36.87
Others	3	1.88
Unemployed	4	2.50
Education		
No formal education	12	7.50
Primary	17	10.63
Secondary	111	69.37
HND/BSc. (Tertiary)	20	12.50
Length of residency		
Less than 10 years	15	9.38
11-15 years	14	8.75
16-20 years	21	13.12
More than 20 years	110	68.75
Total	160	100

The socio-economic characteristics of respondents in Table 1 revealed that 63.75% were males while 36.25% were females. Regarding the age of respondents 3.13% were between 16 and 20 years, 31.87% between 21 and 30 years, 27.50% between 31 and 40 years, 28.75% between 41 and 50 years and 8.75% were above 50 years. The occupation of the respondents revealed that 42.50% were farmers and involved in subsistence agriculture and cash crop production, 3.13% were traders, 4.37% were hunters. Others were civil servants (3.13%), motorcycle drivers (5.62%), students (36.87%), and other forms of employment (1.88%) while 2.50% were unemployed. The education attainment of respondents showed that 7.50% had no formal education, 10.63% had primary education, 69.37 had secondary education, and 12.50% had tertiary education. It was further observed that 9.38% of the population had resided in the area for less than 10 years, 8.75% for 11 to 15 years, 13.12% for 16 to 20 years and 68.75% for more than 20 years.

3.2 Perception on Past and Present Status of the Forest

Table 2 presents respondent's perception on past and present status of the forest.

As indicated in Table 2, majority of the respondents (69.37%) submitted that in the past the forest was of the primary closed forest type, 19.38% claimed it was primary open forest, 6.25% submitted that secondary closed forest was predominant while 5% indicated that the forest was mainly secondary open forest. Furthermore, 15% of the respondents were of the perception that the forest is presently a primary close forest, 71.87% submitted that it is a primary open forest, 5% said secondary closed forest was more in the area while 8.13% opined that it was a secondary open forest.

3.3 Evidence of Deforestation in the Area

The responses on evidence of deforestation in the area are shown in Fig. 3.

Table 2. Status of the forest in past and present years

Forest type	Past		Present	
	Frequency	Percentage (%)	Frequency	Percentage (%)
Primary closed forest	111	69.37	24	15.00
Primary open forest	31	19.38	115	71.87
Secondary closed forest	10	6.25	8	5.00
Secondary open forest	8	5.00	13	8.13
Total	160	100.00	160	100

DF = 3; Chi-square = 105.81; P-Value = 0.0001

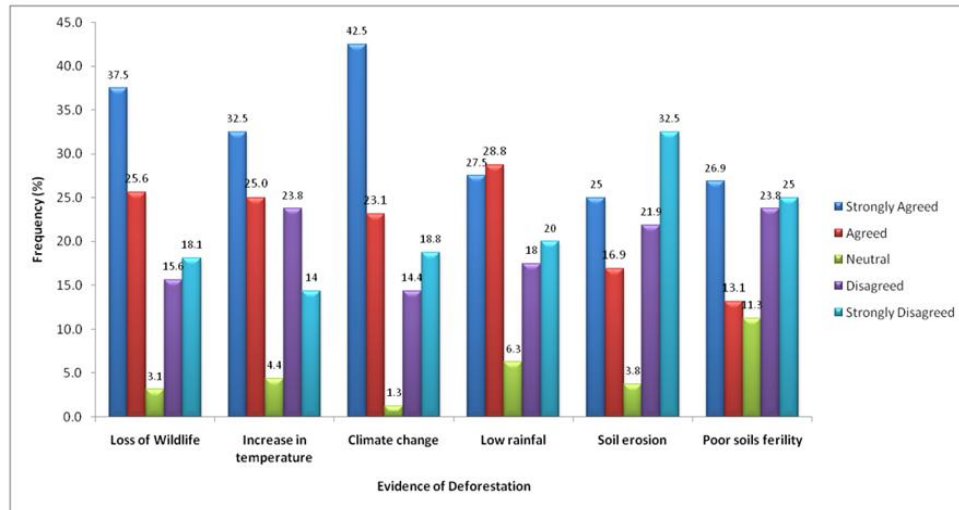


Fig. 3. Evidences of deforestation

On the evidence of deforestation in the community forest, loss of wildlife (63.1%), increase in temperature (57.5%), climate change (65.6%) and low rainfall (56.3%) were considered by respondents as major signals of deforestation in the area. Soil erosion (54.4) and poor soils (48.8%) were perceived as not having any remarkable impact.

3.4 State of Deforestation

The state of deforestation in the area was as shown in Table 3.

Table 3. State of deforestation

State of deforestation	Frequency	Percentage (%)
Rapid	13	8.13
Moderate	30	18.75
Slow	82	51.25
Unpredictable	35	21.87
Total	160	100.00

As indicated in Table 3, 8.13% of the respondents opined that there was rapid state of

deforestation in the area, 18.75% submitted that it was moderate, 51.25% were of the perception that the state was slow while 21.87% considered it as unpredictable.

3.5 Drivers of Deforestation

The drivers of deforestation in the area are shown in Table 4.

It can be observed from Table 4 that 60% of respondents were of the opinion that anthropogenic activities were the major causes of deforestation in the area, 26.25% submitted that both anthropogenic activities and natural phenomena were responsible for deforestation in the area while 13.75% reported that deforestation was caused by natural phenomena.

3.5.1 Categories of anthropogenic drivers of deforestation

Fig. 4 displays the categories of anthropogenic activities responsible for deforestation in the area.

Table 4. Drivers of deforestation in the study area

Drivers of deforestation	Frequency	Percentage (%)
Anthropogenic (human factors)	96	60.00
Natural (nonhuman factors)	22	13.75
Anthropogenic/Natural	42	26.25
Total	160	100

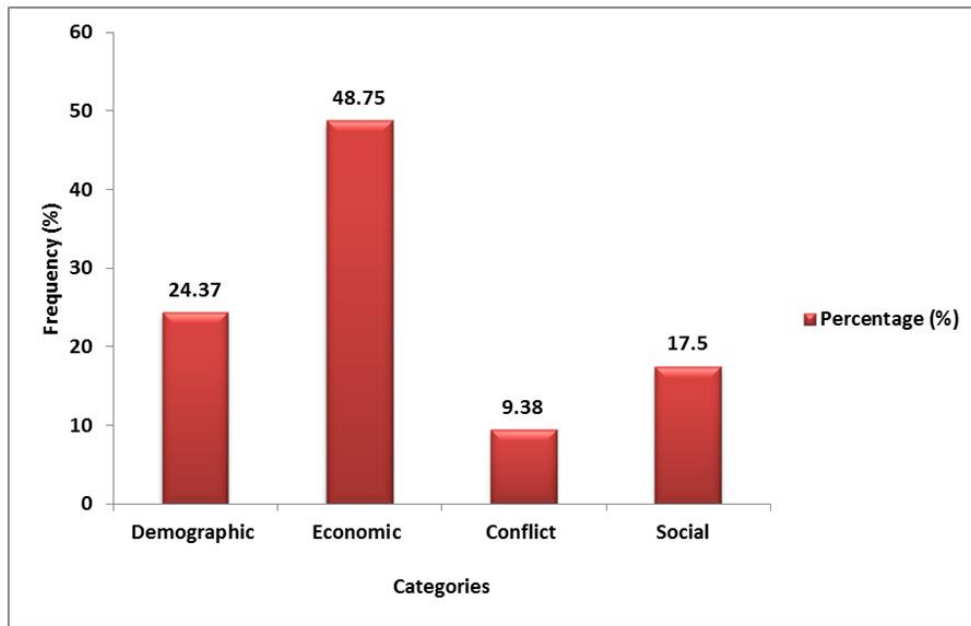


Fig. 4. Categories of an anthropogenic factor of deforestation

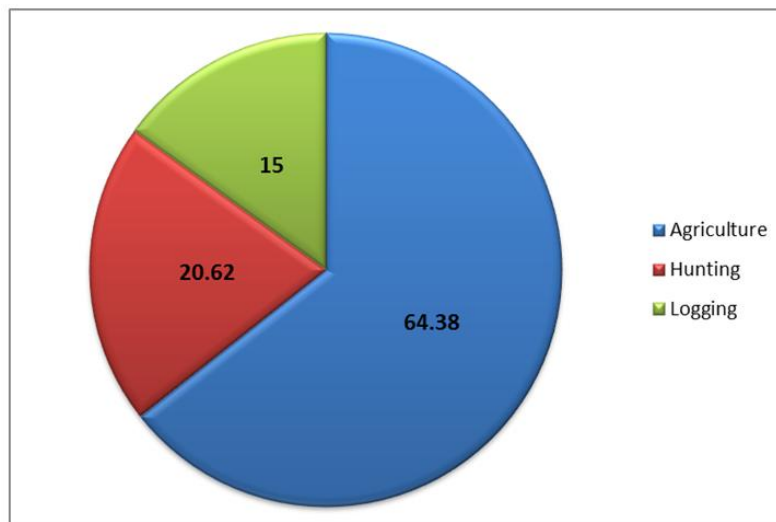


Fig. 5. Major anthropogenic drivers of deforestation

The results from Fig. 4 revealed that 84.75% attributed economic factors (poverty) as a major anthropogenic factor of deforestation. This was followed by demographic elements (24.37%). Social issues and conflicts represented 17.5% and 9.38% of respondent's position respectively.

3.5.2 Major anthropogenic drivers of deforestation

Fig. 5 reveals the most prevalent anthropogenic activities that caused deforestation in the area.

It was indicated in Fig. 5 that 64.38% of deforestation in the area was as a result of Agricultural activities, 20.62% was due to hunting while 15% was as a result of logging activities.

4. DISCUSSIONS

Results from the study showed that the males were more than the females. Although this was attributed to the accessibility of the males during the study, it, however, agreed with finding in a study carried out by Asuk [14] who reported males to be more accessible than females in the study area. It was also revealed from the demographic profile of respondents that majority of the respondent were above the age of 30 years (65%) and practised farming (42.5%) as their major occupation. Also, a significant part of the population had resided in the area for more than 20 years (68.75%). The age of respondents, the nature of their occupation and period of residence in the area makes them experienced enough to offer viable information on the changes in the status of their community forest. Furthermore, results on educational attainment of respondents showed that the population was dominated by individuals who had a minimum of secondary education qualification (81.87%). In addition, during interviews with indigenes, it was observed that those who had no formal education were fairly able to communicate in English thus indicating a significant literacy level and their ability to discern and comment on deforestation in the area.

The status of the forest was assessed based on the respondent's perception of the state of the forest in the past and present. Based on respondents perception, there was significant ($P = .0001$) change in the status of the forest in the study area from the past status of primary open forest to secondary open forest. The loss of tropical forest is a global challenge and thus not peculiar to the community forest of Iko Esai. Despite the fact that there was significant level of deforestation or change in the status of forest in the area, the state was however slow to moderate. According to Kursar et al. [15] although forest cover change is common in many humid and sub-humid tropical areas, the magnitude of this challenge remains difficult to

evaluate. The slow state of deforestation was attributed to the presence of Center for Research, Education and Conservation of Primate and Nature (CERCOPAN), an environmental NGO that supports conservation activities in the study area [17].

The study identified four broad sources of anthropogenic factors that were highlighted by the UNEP [16] as basic techniques to assess deforestation which include demographic, economic (poverty), conflict and social factors. Anthropogenic factor, relating to the demographic and economic disposition of the population, were considered the major drivers of deforestation in the area. The general opinion of respondents using economic reasons was borne out of the overall consideration of the forest as their main source of household needs [18]. Also, Eneji et al. [19] and Olagunju [20] stated that rural poverty can also result in deforestation. However, those who were in support of demographic factors reasoned that deforestation, most times, can lead to an expansion of farmlands into the forest as revealed by the demographic data showing farming as major occupation of the people in that community. Thus, agriculture followed by hunting and logging were observed to be the major anthropogenic activity that drives deforestation in the area. However, logging was perceived as the least anthropogenic activity causing deforestation in the area due to the level of sensitisation given to the people by CERCOPAN [17].

Geist and Lambin [21] and Adeoye et al. [22] pointed out that deforestation is as a result of forest fires, fuelwood collection, urbanisation, agricultural expansion and poor monitoring. However, Efiog [23] attributed deforestation to small-scale shifting cultivation. According to Geist and Lambin, [21] and Kissinger et al. [24] the flora and fauna in a forest remain undisturbed until the need to exploit the forest. Thus, as perceived by the respondents, if deforestation is not checked, it will lead to the loss of the rich biodiversity in the area [14].

5. CONCLUSION

There has been an evident change in the status of Iko Esai community forest over the years indicated by the loss of biodiversity, a decrease in water quality and quantity, and change in rainfall patterns. This change is a result of anthropogenic factors (60%) relating to the

economic and demographic characteristic of the indigene of the area. Agriculture happens to be the major anthropogenic activity driving deforestation in the study area. The presence of CERCOPAN in the area had significantly slowed down the state of deforestation/forest change in the area. Therefore, the effort of CERCOPAN and other NGOs should be intensified in the area. Agroforestry should be incorporated into the agricultural practice for sustainable management of the forest. Afforestation programmes should be carried out to revive the lost community forest in the area.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Adeniyi PA. Environmental sustainability and conservation of Nigeria forest reserves. *Journal of Geography, Environment and Earth Science International*. 2016;6(1):1-9.
2. FAO. Global forest resources assessment 2010 main report, Food and Agriculture Organization of the United Nations Rome. 2010;378.
3. Chakravarty S, Ghosh SK, Suresh CP, Dey AN, Shukla G. Deforestation: Causes, effects and control strategies. In: Okia CA, Editor. *Global perspectives on sustainable forest management*. In Tech, Croatia. 2012;3-28.
4. FAO. Global forest resources assessment 2015. Food and Agriculture Organization of the United Nations, Rome. 2015;253.
5. Anija-Obi FN. *Fundamental of Environmental education and management*. Calabar: University of Calabar Press; 2001.
6. Ogugbuaja VO, Barsisa LZ. Atmospheric pollution in North-East Nigeria: Measurement and analysis of suspended particulate matter. *Bull Chem Soc Ethiop*. 2001;15(2):109-117.
7. Ogogo AU, Odigha O, Aya FA. Ecological restoration and climate change mitigation strategies, Cross River State, Nigeria. *Int J of Res in Appl, Nat and Soc Sci*. 2013; 1(1):13-18.
8. Federal Ministry of Environment (FME). Federal Republic of Nigeria: REDD+ Readiness Preparation Proposal (R-PP). For consideration by Forest Carbon Partnership Facility (FCPF) and The United Nations Collaborative Programme on Reducing Emissions from Deforestation and Forest Degradation in Developing Countries (UN-REDD). 2014;171. (Accessed 22 August 2016) Available:http://www.forestcarbonpartnership.org/sites/fcp/files/2014/july/Nigeria%20REDD%20R-PP_FINAL.%207%20Jun%202014.pdf
9. Akingbogun AA, Kosoko OS, Aborisade DK. Remote sensing and GIS application for forest reserve degradation prediction and monitoring. First FIG Young Surveyors Conference "Knowing to create the Future". Rome, Italy. 2012;27. (Accessed 3 November 2014) Available:http://www.fig.net/pub/fig2012/papers/ss03b/ss03B_akingbogun_kosoko_et_al_6208.pdf
10. Abere SA, Lateef LF, Lameed GA. Assessment of hunters and other rate of illegal activities in Afi-Mbe-Okwangwo Division, Cross River State, Nigeria. *Nat Res*. 2016;7:287-294.
11. Agbogidi OM, Ofuoku AU, Dolor DE. Role of community forestry in sustainable forest management and development: A review. *ASSET Series A*. 2017;7(1):44-54.
12. Asuk SA, Ebu VT, Ifebueme NM. Assessment of community-based ecotourism prospects in southern Nigeria: Case study of Iko Esai Community. *Int J of Agric Policy & Res*. 2018;6(7):111-121.
13. Asuk SA, Nchor AA. Challenges of community-based ecotourism development in southern eastern Nigeria: Case study of Iko Esai Community. *J of Sci Res & Reports*. 2018;20(1):1-10.
14. Asuk SA. The potentials and problems of community-based ecotourism: A case study of the Iko Esai community in Akamkpa local government area of Cross River State. Unpublished BSc. Thesis, University of Calabar, Nigeria. 2010;112. (Accessed 17 May 2018) Available:<https://www.researchgate.net/publication/321463117>
15. Kursar TA, Brenes T, Roddy AB, Coley PD. COS 109-10: Do differences in understory light contribute to tree species turnover along a tropical rainfall gradient? The 94th ESA Annual Meeting; 2009.
16. UNEP. The World Ecotourism Summit; 2002. (Accessed 18 February 2018) Available: www.worldtourism

17. Nchor AA, Simbi-Wellington WS, Asuk SA. Potentials of community based ecotourism in Iko Esai Community of Cross River State, South-Eastern Nigeria. *Int J of Res in Humanities, Arts and Literature*. 2018; 6(1):219-226.
18. Nchor AA, Agbor CO. Local communities attitudes and perceptions towards community based tourism in Iko Esai Community, Cross River State, South East, Nigeria. *Int J of Res – Granthaalayah*. 2018;6(1):69-79.
19. Eneji CO, Ogar DA, Essien CK, Bullum AG. An assessment of deforestation rates in Bekwarra Local Government Area of Cross River State, Nigeria. *J of Environ*. 2014;3(2):28-37.
20. Olagunju TE. Impacts of human-induced deforestation, forest degradation and fragmentation on food security. *NY Sci J*. 2015;8(1):4-16.
21. Geist HJ, Lambin EF. Proximate causes and underlying driving forces of tropical deforestation. *Bio Sci*. 2002;52:143-150.
22. Adeoye NO, Abegunde AA, Adeyinka S. Geospatial analysis of deforestation and land use dynamics in a region of Southwestern Nigeria. In: Moutinho P editor. *Deforestation around the world*. InTech; 2012. (Accessed 11 May 2018) Available:<http://www.intechopen.com/books/deforestation-around-the-world/geospatial-analysis-of-deforestation-andland-use-dynamics>
23. Efiog J. Changing pattern of land use in the Calabar river catchment, south-eastern Nigeria. *J of Sustain Dev*. 2011;4(1):92-102.
24. Kissinger G, Herold M, De Sy V. Drivers of deforestation and forest degradation: A synthesis report for REDD+ policymakers. Lexeme consulting. Vancouver Canada. 2012;48.

© 2018 Nchor and Asuk; This is an Open Access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Peer-review history:

*The peer review history for this paper can be accessed here:
<http://www.sciencedomain.org/review-history/27811>*