ASSESSMENT OF THE LEVEL OF COMMUNITY AWARENESS ON THE EFFECTS OF FOREST DEGRADATION AND LIVELIHOOD IN AFI MOUNTAIN WILDLIFE SANCTUARY

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Abstract
Forests are vital to human wellbeing and environmental stability, providing essential ecosystem goods and services for local communities. However, continuous forest degradation in Boki Local Government Area, Cross River State, poses a serious environmental and livelihood threat. In 2021, Nigeria lost about 96.5 kha of its natural forest, contributing to over 65.3 Mt of CO_2 emissions and accelerating climate change impacts such as rising temperatures and extreme weather events. This study assessed the level of community awareness on the effects of forest degradation and its implications for livelihoods in Afi Mountain Wildlife Sanctuary, Boki Local Government Area, Cross River State, Nigeria. A structured questionnaire was administered to respondents using a random sampling technique, and 120 respondents were selected across different communities surrounding the sanctuary. Data collected were analyzed using descriptive statistics (percentages and tables) and inferential statistics such as the Pearson Product Moment Correlation Coefficient. Findings revealed a high level of awareness among community members regarding the effects of forest degradation on their livelihoods, particularly in areas related to non-wood forest product availability, soil fertility decline, and fuelwood scarcity. The study recommends strengthening community-based forest management initiatives and increasing public education on sustainable resource use to reduce pressure on forest ecosystems
***keywords*:** *community awareness, forest degradation, livelihood and perception,*

Introduction

Forest is the heart of human wellbeing and environmental health. They sustain human livelihoods strategies and including the provision of other ecosystem goods and services such as medicines, edible fruits, game meat, and incomes for majority of the local population in developed and developing countries. Over 3 billion cubic meters of wood are harvested annually from forests for use as fuel wood and shelter (Chadwick *et al.,* 2014). According to Nkonya *et al.* (2016), about 2.4 billion people cook with wood fuel, and at least 1.3 billion people rely on forest products for shelter. Forests also support industries, formally employing about 13.2 million people across the world and informally at least 41 million people. Also examined those forests provide about 20% of income for rural households in developing countries like Nigeria. Additionally, it also provides cultural services that include spiritual wellbeing. Furthermore, forests protect the ecosystem by providing regulatory services like carbon sequestration, which is critical for mitigating climate change. This mitigation function is thought to be less expensive than those in other industries.

Forest degradation is a serious global problem. Chokkalingam, *et al.* (2018) reported that forest degradation is caused by multiple forces, including extreme weather conditions, particularly drought. It is also caused by human activities that degrade the quality of soils and land utility has been recognized to aggravate forest loss and these have negatively affected the quality of food production, livelihoods and including the provision of other ecosystems goods

and services. Desertification is a form of land degradation by which fertile land becomes barren and unfertile. Similarly, forests and woodlands are also some of the most biologically diverse systems on the planet. Forests and woodlands as essential components of ecosystems play a key role in protecting the environment. They support the provision of a wide range of services including ecological services such as the regulation of water systems by intercepting rainfall and regulating its flow through the hydrological cycle (Brauman, 2015). In developing countries, about 1.2 billion people, including more than 400 million in Africa, rely on closed forests and open woodlands systems to sustain agricultural productivity and income generation (Damnyag *et al.,* 2013). Despite this, the deforestation and woodland degradation in the Nigeria region have been attributed to the direct effects of human activities such as unsustainable tree cutting (for poles, wood fuel, charcoal burning, and medicinal plants), bushfires, population growth, and the associated demand for more agricultural land, poor farming practices, overgrazing, soil erosion, destruction of habitats of wildlife and pollution of water bodies (EPA, 2017; Gyasi *et al.,* 2016). Furthermore, the destruction of forests and woodlands in the Cross River appears to exceed their regeneration capacities.

Deforestation in rural communities has resulted in an acute shortage of wood for construction and fuel, change in the micro-climate (rainfall variability, increasing temperature, dry spells, and floods), and soil erosion of vast lands (Gyasi *et al*., 2016). Therefore, deforestation has a direct and indirect impact on socio-economic and sustainable development in Cross River in particular and the country as a whole.

Materials and Method

The Study Area

Afi Mountain Wildlife Sanctuary, formerly part of the Afi River Forest Reserve, was established in 2000 to provide better protection to important populations of several endangered species, including the critically endangered Cross River gorilla, the Nigeria-Cameroon chimpanzee, the drill, and the grey-necked rock fowl. Afi is made up of around 100 km2 of lowland and sub-montane forest, with rocky peaks up to 1,300 meters. Outside of the national park, the Afi Mountain Wildlife Sanctuary and the neighbouring Afi River Forest Reserve make up one of the largest forest blocks left in Cross River State. The Cross River State Forestry Commission/Ministry of Climate Change and Forestry is currently in charge of Afi.

Sources of Data Collection

This study relied solely on primary data, which were obtained directly from respondent in the selected communities surrounding the Afi Mountain Wildlife Sanctuary. The data were collected through the administration of structured questionnaires, oral interviews and personal observations.

Population of the Study and Sampling Technique

The Afi Mountain Wildlife Sanctuary is surrounded by five villages namely Olum, Kataba, Kayang, Boje, and Baunchor. People living in one nearest community (Baunchor) formed the population of the study targeting one hundred and fifty (150) residence. However, the primary respondents were adult community members of twenty years and above (both males and females), being representatives of farmers, charcoal burners, volunteers, traders and community leaders. For the study to have a fair representation of the population under the study, the simple random sampling (SRS) technique, employing the lottery method was used to select twelve

sections for participation in the data collection.,. In the absence of an existing up-to-date household sampling frame, an Agricultural Extension Officer who works in Afi Mountain Wildlife Sanctuary but stays in Baunchor and two other residents of the said community assisted the researcher to identify and list compounds in the selected sections of the community. Again, simple random sampling was used to select compounds and households in compounds for data collection.

Data Collection Instrument

Questionnaires were used as a research instrument for data collection. The questionnaire consisted of a list of questions that were administered to respondents to obtain information on the assessment of the level of community awareness on the effects of forest degradation on livelihood in Afi mountain wildlife sanctuary. The questions allow respondents to make personal decisions based on individuals' degree of rating and intensity of items contained in the questions which varied from Yes (Y), No (N) and ticking the appropriate box that matches the information you wish to provide.

Data Analysis Technique

The Pearson product-moment correlation coefficient technique was used in the research work. Correlation is a statistical technique used in the testing of hypotheses to predict what the relationship between two variables should be. It is used in drawing and reaching conclusions by collecting the observed values from the questionnaire administered by respondents. Descriptive statistics such as mean, percentage, charts, frequency were employed to analyze the socio-demographic characteristics of the respondents. A regression analysis was used to assess the effects of selected socio-economic factors (education, belief, and income level) on respondents' awareness and adaptation strategies. The analysis was applied to data collected from all sampled communities to determine the predictive influence of these variables on awareness levels. The regression equation is given as:

$$r = \frac{n\sum XY - \sum X\sum Y}{\sqrt{(n\sum X^2 - (\sum X)^2)(n\sum Y^2 - (\sum Y)^2)}}$$

r = Co-efficient of variation – $1 < r < 1$
X - Respondents response
Y - Likert scale
$\sum$ - Summation
n - Number of variables
Where X - Dependent variables
Y - Independent variables

The test for significant r = t

Where $t = r\sqrt{\frac{n-2}{1-(r)^2}}$

n = Number of observation or period
r^2 = Coefficient of determination

Socio-Demographic Characteristics of Respondents

The response rate table shows the distribution of the questionnaire research instrument. It demonstrated that there was a high response rate from the respondents, as out of the 150 copies of the questionnaire distributed, 135 copies representing were returned, while 15 copies representing were not returned.

Table 1: Questionnaire Response Rate

Number of the administered questionnaire	Number of the valid questionnaire	Number of the invalid questionnaire	Percentage of the valid questionnaire	Percentage of the invalid questionnaire
150	135	15	90%	10%

Result

One hundred and thirty-five (135) questionnaires were retrieved from the correspondent, while fifteen copies were not returned out of one hundred and fifty (150) questionnaire that were distributed in twelve communities in Boki Local Government Area. This section presents a descriptive statistical analysis, discussion and finding of the of respondents' understanding of deforestation and forest degradation, an assessment of trees that are typically cut from the forest reserve uses of trees cut, and perceptions of the consequences of uncontrolled forest degradation.

Respondent's views about deforestation and forest degradation

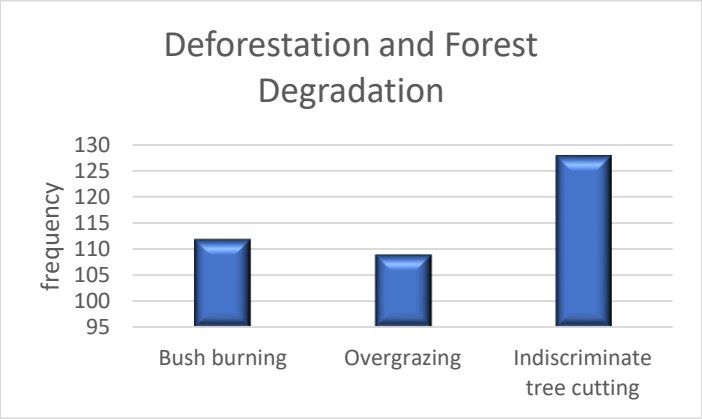

Figure 1: Respondent's views about deforestation and forest degradation

From the onset, it was important to assess the study participants' understanding of deforestation and forest degradation.

The respondents, however, could not define or make a fine distinction between the terms deforestation and forest degradation, they had a fair idea of the direct drivers (causes) of deforestation and degradation of the community forests. In multiple response questions, 98.8% of the respondents cited indiscriminate cutting of trees in the forest reserve as being responsible for ongoing deforestation and forest degradation. The respondents appear not to consider bushfires and overgrazing as major factors for deforestation and forest degradation. The results further suggest that majority of the respondents' understanding of deforestation and forest

degradation is the wanton felling of trees without replacement. This is an indication that tree cutting is the underlying direct cause of deforestation and forest degradation in the area, even though there may be other factors that appear less visible to the people.

With the increasing population of fringe settlements and socio-economic activities, the conversion of portions of the wildlife sanctuary and forest reserve into agricultural land for crop cultivation, and infrastructural development could become a major threat to conservation measures. This finding is consistent with the observation of Ahmed (2012) that the principal human-related causes of deforestation worldwide are agriculture, livestock grazing, and the increasing demand for wood for energy and construction.

Trees Typically Cut from the Reserve

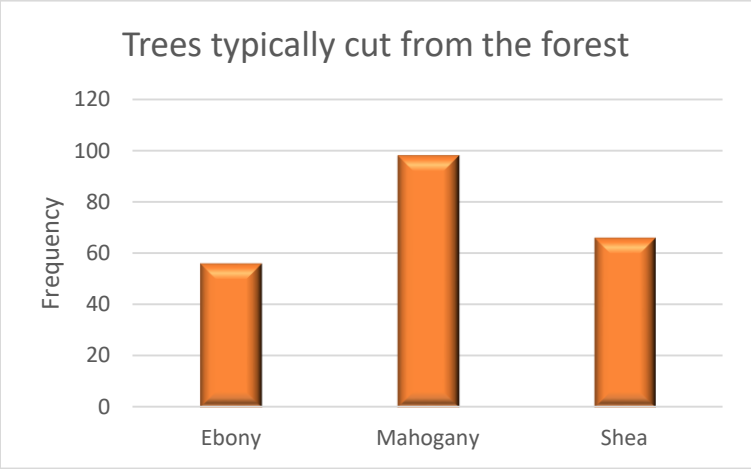

Figure 2: Trees typically cut from the forest

Respondents were asked to indicate the type of trees (tree species) that are commonly cut from the community forests reserve. The multiple response results presented in the above table show that 73% of the study participants reported that mahogany was the typical tree species cut from the forests, followed by shea trees at 48%. Ebony was mentioned as the tree people rarely fell 42% because of scarcity. This finding is not surprising because mahogany is mostly cut indiscriminately by illegal chain-saw operators for sale as timber in the local markets, due to the shortage of quality timber for building purposes. Adu-Bonnah, (2020) reported that wood from forest reserves was the second most important source of timber among chainsaw operators in Africa. This confirms why mahogany is perhaps the most important tree harvested from the forest reserve in the study area.

Effects of Deforestation and Forests Degradation

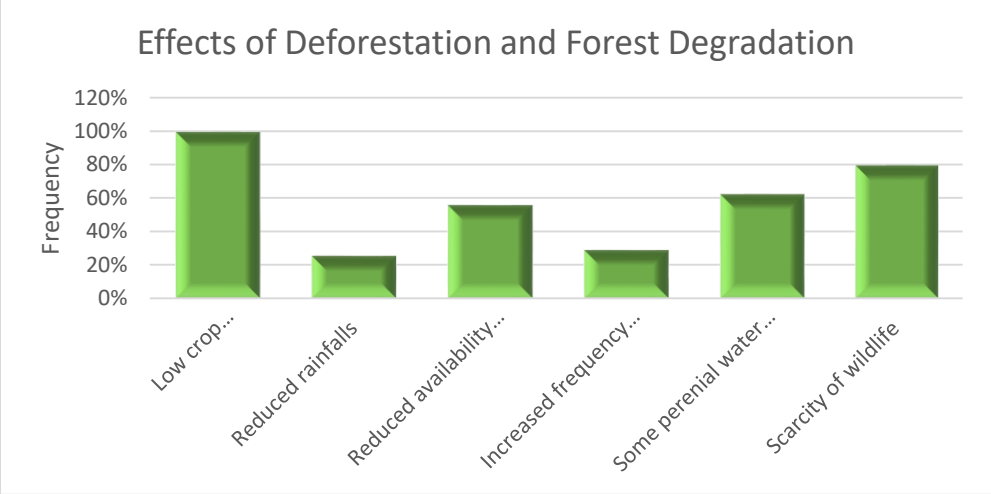

Figure 3: Effects of Deforestation and Forests Degradation

Respondents in total admittance indicated that deforestation and forest degradation have negative effects on the community. The respondents were then asked to mention these negative effects. The multiple response results presented in the table show that the majority of the respondents (26%) cited reduced rainfall as a direct effect of deforestation and forest degradation, and almost half (100%) of them mentioned poverty and poor crop yields, close to a third (29%) cited increased frequency and severity of windstorms, and more than one-quarter (63%) identified drying up of local perennial rivers and streams (change in the local hydrological system). Again, almost one out of five (80%) of the respondents perceive a loss or scarcity of wildlife (such as the Cross River Gorilla) and other flora and fauna (loss of biodiversity) being the direct effects of deforestation. This is an indication that many of the community people may not perceive a loss of biodiversity as a serious problem associated with deforestation and forest degradation. However, Ahmed (2012) and Clark et al., (2019) have noted the loss of biodiversity is probably the most serious consequence of deforestation. In other words, it means the destruction and extinction of many plants and animal species will continue, many of which will remain unknown and the benefits left undiscovered.

Furthermore, Ken et al., (2020) reported that deforestation and forest degradation reduced poorer rural households' ability to access both the direct and indirect benefits of community forest reserves. The direct benefits of forest reserves to the local people identified in the study include food, fuel, timber, construction materials, medicinal plants, bedding for animals, and leaves for compositing. The indirect benefits include ecological services such as watershed protection, erosion control, soil fertility, and windbreaks for farmlands.

Conclusion

Based on the findings from the study, conclusion could be drawn that there are some level of awareness on the shrinking forest reserve. However, rural poverty is real and undesirable and livelihood options are leading the driving practices of unsustainable usage and overexploitation of the Afi Mountain Wildlife Sanctuary and forest reserve resources leading to land degradation, loss of wildlife and biodiversity, loss of soil fertility, rising temperatures, changes in patterns of water, and an increased frequency of extreme weather events. Also, there is low community involvement on policy making for the preservation of forest reserve. Therefore, the need for

multiple livelihood option members and community participation to stimulates the *formulation* of implementable *policies* for the preservation of forest reserve of the Afi Mountain Wildlife Sanctuary and other forest reserve in Nigeria.

Recommendations

Based on the study the following recommendations are made:

1. Urgent change the perception and attitudes of members community around the Afi Mountain Wildlife Sanctuary and other forest reserve in Nigeria, environmental education and awareness through sensitization should be encouraged broader participation among the community members of the conservation project; practical strategies to reduce the deforestation and forest degradation arising out of logging and charcoal production should be solved from both short and long term perspectives.
2. Conservation Education and Sensitization on ownership among the community members to stimulate *formulation* and development self- implementable *policies* that will enable them protect the forest reserve from illegal exploitation of the forest products, bush burning, and cutting of trees etc either by the community members or outsiders.
3. Community involvement and participation in decision and policy making should be sustained through multi-stakeholder (women, youth, and faith group and community base organizations, CBOs) consultations

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