ANALYSIS OF ECONOMICALLY-VALUED FOREST TREE SPECIES AT THE SITE AND HOST COMMUNITIES OF THE GODSWILL AKPABIO INTERNATIONAL STADIUM IN UYO, AKWA IBOM STATE, NIGERIA

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ABSTRACT

The study was conducted to assess the economically valued forest plant species at the site and host communities of the Akwa Ibom State (Godswill Akpabio) International Stadium in Uyo, Akwa Ibom State in 2015. Quadrants of 20m x 20m were laid randomly along five 1km line transect and accordingly assessed. Thirty tree species producing various economically valued products were assessed and trees of 30cm tall and above were counted as present. 7 out of the 28 Tree species were observed to be rare while 21 were abundant. Fifteen species of shrubs were assessed out of which, 8 were identified as abundant and rare (5). Products collected from these plants have varying use categories as leafy vegetables, edible and medicinal fruits, leaves, seeds, barks, fodder, poles, timber, stakes and chew sticks. As observed in the studied area, there is already over exploitation of economically valued trees and shrub species, especially at the site and host communities to the International Stadium. The study established that over exploitation, exploration and conversion of forest ecosystems in the area has brought about decimation of biodiversity as well as extinction of many valuable trees, plants and animal species. It is strongly

recommended that domestication of indigenous fruit trees and shrub species be encouraged and supported. Indigenous fruits trees should be established on the streets of Uyo Capital City and Local Government Headquarters to mitigate the effect of climate change and provide fruits and food for the people. Monthly Tree planting exercise should be re-introduced in all the 774 Local Government Areas in Nigeria, so as to replace destroyed and nearly extinct fruit trees, plants and animal species. Conservation efforts through the establishment of nature reserves, botanical gardens, sacred grooves, sanctuaries, rare breed centres, game banks and on-site gene banks should be supported to enhance sustainability of environment.

Keywords: *Economic trees, shrubs, International Stadium, Akwa Ibom State.*

Introduction

The environment according to Agbogidi and Ofuoku (2007) is the closest neighbour of man. Man depends directly and indirectly on the environment for almost everything relating to growth and survival on planet earth. Among the major biotic components of the environment are forests and other vegetation and the wise management of the environment depends on a better understanding of its components. Given the dynamic nature of the global ecosystem, environment changes, driven by man-made and natural cause is inevitable. Economic activities and the rate of population growth have increased to a point where the effect of humanity on the environment can no longer be ignored (Aju, 2002). The importance of forest, especially trees to mankind cannot be overemphasized, Agbogidi and Eshegbeyi (2008) noted that forests and forest products play vital roles in human life from the cradle to the grave. Aimufia (2002) emphasized that the cot on which the baby lies at birth, the buildings and furniture he uses, at the various levels of his education, his endeavours in industry and agriculture, the accommodation and furniture he acquires as a worker/ entrepreneur, his diet and health sustaining systems, the armchair, he relaxes on his old age, and the coffin or casket in which he returns to Mother earth are forest dependent. Etukudo (2000) emphasized that forests are man's divine treasure.

Aliyu (2006) stated that reasonable numbers of medicinal species are threatened by habitat loss following heightened deforestation (Agbogidi, 2002; Udoh, 2001; Agbogidi and Ofuoku, 2006). Although there is a great incompatibility between urbanizations/industrializations and agriculture, conservation developmental activities should be environmentally friendly to allow for a sustained productivity (Agbogidi and Okonta, 2009). Anthropogenic activities including farming, hunting, tree felling, bush burning, mining operation, petroleum exploitation, civil engineering impact the forest negatively (Adeyemi and Jegede, 2002). Adelusi, Agboola and Oni, (2002) noted that urban forest reserves and enclaves have suffered more and undue depletion and degradation with loss of biodiversity and renewable resources as a result of urbanization and encroachment on areas originally perceived as forest reserves and estate. Impact of certain projects on the vegetation of ecosystems in the tropics including Nigeria is widespread. For example, establishment of modern markets, television stations, amusement parks, housing estate, company sites, stadia in Nigeria and other parts of the tropics has led to the removal and destruction of various economic vegetation, the use of some are yet to be discovered (Agbogidi, 2011). Replanting, tree planting campaign and environmental

regeneration are some of the practices that can sustain trees, which are very significant in human lives and the environment. The aim of this study is the valuation of trees found at the site of Akwa Ibom State (Godswill Akpabio) International Stadium, Uyo in Akwa Ibom State

Statement of Problem

The economic and environmental problems facing the developing world are staggering in their magnitude and their complexity. They are fueled by the vicious cycle of population growth and persistent poverty. Most countries face serious problems in urban environment: overcrowding, unemployment, growing crime, lack of portable drinking water, inadequate sewage disposal, increasing air and sound pollution and the inappropriate disposal of toxic wastes. In rural areas, the deterioration of natural resources not only destroys the environment, but also undermines the very foundation on which economic growth and long term prosperity depend. The catastrophic impact is seen in accelerating soil erosion, which results in permanent loss in agricultural productivity, in advancing desertification accompanied by drought, terrorism and famine, in declining coastal and inland fisheries with the associated threats to food security, in the misuse of agrochemicals that poison both people and the environment, in the alarming sedimentation of fragile ecosystems; and in the destruction of biodiversity-rich wetlands. But suffice it to say that none of these natural resource problems is more threatening, none more in need of immediate action, than the destruction of indigenous tree crops and deforestation of the forests.

Competition between humans and other species for the remaining ecological niches on land and its resources is substantially demonstrated by the conversion of forest land to other uses such as: agriculture, infrastructure, urban development, industry among others, resulting in failure in the working of the economic systems to reflect the true value of the environment. Basically, many of the functions of tropical forests areas, including Akwa Ibom State, are not deeply studied and as such are ignored in decision making plans. Additionally, decisions to convert tropical forests are themselves encouraged by fiscal and other incentives, ignoring the environmental consequence of this important human resource and as such, forests plants and tree are rapidly being degraded, logged and cleared for agriculture and other developmental projects, like the Ibom (Godswill Akpabio) International stadium in Akwa Ibom State.

In the recent years so much has been said about the impacts of deforestation in the Niger Delta Region and Akwa Ibom State. This is becoming more pronounced with increasing population of the state, which according to NPC (2006) stood at 3,920,208 then, making 2.8% of the national population. As of 2015, the population of the area is estimated to be 5,272,029 people. The effects of such depletion with corresponding population increase have led to a decline in forest cover, forest degradation, impoverishment of the soil and general deterioration in environmental conditions and worse of all loss of diversity and economically-valued tree crops. For example, deforestation has often led to frequent occurrence of erosion, flooding and siltation of stagnant water bodies in some part of the study area, especially Abak Road, IBB Avenue axis in Uyo Capital City, Oron Road by Uruan Street, severe gully erosion at Eka Street by Ikot Ekpene Road, University of Uyo Town Campus ravine, to mention just a few.

One critical aspect of the knowledge gap in environmental degradation and deforestation is the shortage of reliable economic values of deforestation Due to this shortage; policymakers often do not have credible evidence bases to promote sound tree crops and forest management. While literature is replete with information about the consequences of deforestation of indigenous tree crops, past studies did not produce quantitative estimates about the economic losses from deforestation. Generally, the socio-economic consequences of tree crops, forest exploitation and consumption are overlooked. In Nigeria, majority of the households cooking in the home depend on fuelwood, which is responsible for more than 75% of all energy consumed. Most small-scale industries and food processing enterprises that women undertake depend in large part on fuelwood, this dependence on fuelwood has also contributed to the growing exploitation of the state's forest resources. The economic implications of deforestation in the study area include scarcity of fuelwood for cooking and heating, especially among the rural populace. This accelerating nature of deforestation is also threatening the sustained resources base of the forest raw materials in the state.

Purpose and objectives of the Study

The main purpose for the study is to conduct analysis of losses of economically-useful tree crops from deforestation in the host communities of the Akwa Ibom International Stadium in Uyo, Akwa Ibom State. To achieve this purpose, the study aims to:

1. Examine the nature and extent of deforestation in that area;
2. Identify and analyze the factors that influence the decision to deforest the area;
3. Identify, estimate and analyze economic losses from the deforestation;
4. Evaluate the effect of deforestation on the host communities; and
5. Derive lessons for sustainable management and use of forests.

Materials and Methods

Study Area: The study was conducted in Akwa Ibom State, Nigeria. Akwa Ibom State of Nigeria created out of Cross River State on September 23, 1987. It is located in the coastal South-Southern part of the country, lying between Latitudes 4° 32’ and 5° 33’ north of the Equator and Longitudes 7° 25’ and 8° 25’, east of the Greenwich Meridian. The State is bordered on the east by Cross River State, on the west by Rivers and Abia States, and on the South by the Atlantic Ocean and the southernmost tip of Cross River State. Akwa Ibom State has basically two distinct seasons: The rainy season, which lasts from May to October, and the dry season which lasts from November to April. The mean annual rainfall over the area decreases gradually from about 4,050mm near the coastal area (the southern part) to about 2,100mm in the north. Temperatures are uniformly high throughout the year. The mean annual temperature is 26.9°C. Relative humidity remains at an average of 70 to 80% throughout the year except for the short period of the dry season (AGROMET, 2012, Ekpenyong, 2013). The population of Akwa Ibom State was estimated at about 3,902,051 with density of 330 persons per square kilometer (NPC, 2006).

The Akwa Ibom International Stadium is an all-seater national sports stadium located in Uyo, the state capital of Akwa Ibom. The stadium serves as a home to the Nigerian Super Eagles as well as a center for various social, cultural, and religious events. The contract for the construction of the Akwa Ibom International Stadium complex and Games Village was awarded in 2012 to Julius Berger and was completed in 2014. The 30,000 seater ultra modern multipurpose sports complex was modeled after Allianz Arena (*Crentsil, 2014*). The stadium structure is in two phases which includes a 400m-running track for athletic events, and is the pilot part of Uyo Sports Park development, and is enclosed by a white triangular-shaped outer covering that encircles the whole spectator stand. The East Stand and Curves can seat approximately 22,500 people. The Governors' Lounge has sitting capacity for between 30 and 40 VIPs and is located in the Grand Stand on Level Two. It is constructed to carry little more than 30,000 spectators whether for soccer or track and field events, while the Grand Stand can comfortably accommodate about 7,500 spectators, including the VIP/VVIPs. There is also a six-lane track built specifically for athletes to train (*Utip, 2014*).Construction cost $96 million (*Supersports.com, 2014*). It was opened on the 7th of November 2014. The study was conducted in the area following the procedure of assessment of plant species found around the Akwa Ibom State International Stadium, Uyo, especially those producing economically valuable products. Communities affected by the project include: Ikot Ekpe, Obio Offot and Obio Etoi all in Uyo Local Government Area.

Methods: Direct counting of present plants of 30cm and above in height of the assessed plant species was done in the study area. A plant species was classified as abundant or rare based on its frequency count in all the assessed sections of the villages occupied by the International Stadium. A plant species found in 40 percent and above of all the assessed quadrants was considered abundant while a species present in less than 40 percent of all the assessed quadrants was regarded rare following the procedure of Olajide, Udofia and Etigale, (2008).

Table 1
Economically Valued Trees and Shrubs found around the Akwa Ibom State International Stadium Uyo in 2014

S/No	Scientific Name	Common/ Local Name	Habitat	Total Abundance	Products	Local Uses	Ecological Status
1.	*Juglans nigra*	African Walnut	T	24	Seeds	F	R
2.	*Garcinia cola*	Bitter Cola (Efiat)	T	46	Seeds	F, M	A
3.	*Irvingia gabonensis*	Dika nut (Ogbono) (Uyo)	T	20	Seeds and fruits	F	R
4.	*Azadirachta*	Neem	T	42	Leaves, roots and	M	A

	indica	(Dogonyaro)			seeds		
5.	*Pentaclethra macrophylla*	Oil bean	T	43	Seeds	F, M	A
6.	*Monodora myristica*	African Nutmeg	T	22	Leaves, barks and seeds	F, M	R
7.	*Gambeya albida*	African Star Apple (Udara)	T	53	Fruits	F, M	A
8.	*Treculia africana*	African Breadfruit (brefud)	T	51	Fruits	F, M	A
9.	*Elaeis guinensis*	Oil palm (Eyop)	T	51	Fruits, leaves, stem	F, W	A
10.	*Xylopia aethiopica*	Guinea Pepper (Adusa)	T	50	Seeds and leaves (Spice	F, C	A
11.	*Ricinus cummunis*	Castor oil	S	24	Leaves and seeds	F, M	R
12.	*Vitallaria parodoxa*	Shear butter	T	18	Roots, nuts and leaves	F, M	R
13.	*Raffia hookerri*	Raphia Palm	T	62	Fruit (wine) leaves, stem	W	A
14.	*Cola nitida*	Kola nut	T	60	Fruits	M S	A
15.	*Cocos nucifera*	Coconut	T	41	Fruits, leaves	F C	A
16.	*Oxytenanthera albyssinica*	Bamboo	S	48	Stem	C Co	A
17.	*Milica excels*	Iroko	T	27	Stem	T	R
18.	*Prosopis africana*	Locust Bean	T	62	Stem	F, M, Fd	A
19.	*Baillenolla toxisperma*	African pear	T	51	Stem and fruit	CO Ww M	A
20.	*Leucaena leucocephala*	Leucaena	S	50	Leaves and stem	M Sc	A
21.	*Tetracarpidum conapharum*	Ukpa	S	42	Nuts and leaves	M	A

22.	*Annona muricata*	Sour Sop	T	50	Fruits	F, M	A
23.	*Moringa oliefera*	Miracle Tree	T	53	Leaves, roots and seeds	Fo, M	R
24.	*Dennittia tripetala*	Pepper fruit	S	48	Fruits and roots	F, M	A
25.	*Vernonia amygdallina*	Bitter Leaf	S	62	Leaves	F, St	A
26.	*Laphira lanceolata*	Chew Sticks	S	64	Stems	Mw M	A
27.	*Ocimium gratissimum*	Scented leaves (Curry)	S	34	Leaves, exudates and roots	M	R
28.	*Jatropha curcas*	(Physics nut) Jatropha	S	56	Leaves and Roots	M Fo	A

Source: Field Survey, 2015

Legend T= trees, S = shrubs, F=food, Fo = fodder, M = medicinal, C = crafts, Co = construction, Tm = timber, St = stimulant, Ww = woodwork, Sc = Soil conservation, Fu = furniture, B = basketry, W = wine, Mw = Mouth wash, Sk = stake, Wf = wrapping food and R = rare, A = abundance.

Results and Discussion

Thirty tree species producing various economically valued products and found within the villages that host the Akwa Ibom State International Stadium were assessed (Table 1) above. Nineteen (19) of the 28 trees and shrub species were observed to be trees, while shrubs were nine. Out of the total population, 21 were identified as abundant and 7 were identified as rare (Table 1). Findings confirmed the economic products that are harvested or collected from these plant species to include: nuts, fruits, seeds, leaf vegetable, bark, leaves, fodder, chew sticks, poles, stakes, timber, juices, resins and dyes and have varying use categories as medicine, food, local construction materials, craft as well as other uses including socio-cultural and environmental values, which connotes with study by Udo, 2001; Abu, 2002; Jimoh and Haruna; 2007; Agbogidi and Eshegbeyi, 2008; Idumah, Onyeanusi and Ajayi, 2008; Adedodun, Oladoye, Olawumi and Laminou, 2010. The seven (7) rare species of the tree crops observed in the studied area could be as result of habitat loss in the forest ecosystem due to the stadium as well as increased and uncontrolled housing development in the hosts' communities due to influx of people because of the stadium. If this study was done in the whole state, there are mark evidence that trees that are rare would outnumbered those that are in abundance. As observed in the study, there is already over-exploitation of economically-valued tree crops and shrub species and this call for the preservation of the ecosystem. This supports the view of Roper and Robert (2006)

that deforestation as a process that involves a competition amongst different land users for scarce resources, a process exacerbated by counter-productive polices and weak institutions, creates wealth for some, cause hardships for others, and almost always brings serious consequence for the environment

Conclusion

The observation from this study shows that, most of the trees, while they seem to be in abundance are found near shrines and graveyards due to the fear and belief that the shrines house their "gods", else, this is to say that it is these shrines that save as protection for these tree species from human destruction. Nature reserves, mini forest lots, green parks, groves and sanctuaries should be established in the area to enhance conservation and preservation to the fragile tree species and shrubs so that they do not go out of extinction and to ensure sustainability of the natural resources and the environment. Out of the 21 tree crops identified as abundant and 7 of the sampled trees/crops were identified as rare (Table 1). In conclusion therefore, it is evident that there were economic losses from this source of deforestation activity in the study area. The major determinant that led to farmlands clearance which resulted to economic losses from deforestation in the host communities of the International Stadium was: lack of inclusion of replacement and replanting of the indigenous tree crops in the Environmental Impact Assessment (EIA) in the strategic planning and implementation document that created the infrastructure.

Therefore, there is need for improved policy on deforestation activities in the state if the Government hopes to generate both local and foreign exchange from the forestry sector and make the environment friendly. This is because the contributions of this sector would not be met without provision of efficient and effective forestry polices, which will reduce under and over exploitation of the forestry resources. There is also the need to address the concerns of the rural dwellers that are involved in over and under exploitation of the forestry resources that lead to economic losses from this sector, especially as they concern indigenous tree crops. Based on the above the following strategies are suggested:

Recommendations

Based on the above research findings, the following recommendations are advanced as means of preventing economic losses of economically-valued tree crops from deforestation in the study area.

-1. There should be policies that will divert the abundant energy expended on indiscriminate deforestation activities by residents to afforestation, reforestation, tree husbandry and tree planting in the state should be encouraged. This will help to checkmate the recent frequent conversion of forestland to arable cropping and other uses in the state
2. Government should reinvigorate tree planting and replacement literacy programme to allow farmers become aware of the need to sustain their livelihood through tree planting. This will help them improve on their environmental friendliness.
3. The forest extension agents should be adequately motivated, trained and remunerated toward giving relevant, clear and sensible technical advice to the stakeholders in the forestry and environmental activities.
4. Host Community participation in the forestry conservation and protection initiatives should be made mandatory. This will encourage these communities to always innovate indigenous methods to stop under and over-exploitation of indigenous tree crops and forest resources. They will also develop a sense of ownership and commitment to all decisions made about reducing deforestation in their area.
5. Akwa Ibom State Government should adopt strategies and policies that will encourage improved farming practices and agricultural methods such as: alley cropping, urban gardening and *Taungya* farming. This will divert the attention of rural famers that are constantly involved in deforestation due to proximity of these forests to their homes and will further protect holistic agricultural activities which is the mainstay of the Nigerian economy.
6. Frequent use of workshops, advocacy and seminars are necessary to educate the host community members more on the negative consequences of deforestation. This will help them to have adequate information on the new policies of the government concerning environment and forestry sector.
7. The study equally recommends the enforcement of the 1901 Act of planting twenty (20) trees in the place of every one stump removed as a replacement for sustainability.
8. Provision of energy saving stoves by the Government to the rural people can also save the situation. This energy saving stove will help to reduce the quantity of fuelwood used and hence reduce the level of deforestation.
9. Domestication of indigenous tree crops and shrub species is advocated both for poverty alleviation in rural communities and for a balance to be maintained in the ecosystem
10. The Federal and State Ministries of Environment should re-introduced the Tree Planting Exercise so that individuals, groups, corporate organizations and communities practice planting of trees to compensate for those destroyed by development projects and other factors.
11. There is need for improved policy on deforestation activities in the state if the Government hopes to generate both local and foreign exchange from the forestry sector and make the environment friendly. This is because the contributions of this sector would not be met without provision of efficient and effective forestry polices, which will reduce under and over exploitation of the forestry resources. There is also the need to address the concerns of the

rural dwellers that are involved in over and under exploitation of the forestry resources that lead to economic losses from this sector, especially as they concern indigenous tree crops. Based on the above the following strategies are suggested:

Major Contributions to Knowledge

The study is well situated in the global concern as it relates toward its contributions to knowledge in achieving the 7th Millennium Development Goal No.6 to ensure environmental sustainability (MDGs7). Economic losses of this sector can be exploited by encouraging the community members to harvest only the mature wood and non-wood forestry products.

Also, the study has exposed the need for extensive data (primary and secondary) in forestry analysis in public policy decision making in Akwa Ibom State.

There exist very little and vague empirical understanding of roles of factors of deforestation in the study area, but this study have helped to expose the interaction of these factors and the magnitude of their effects in the state especially in the Etoi, Obio Offot Ikot Ekpe and other adjourning host communities' settings where such knowledge are lacking, to both policy makers and other major stakeholders in the forestry sector.

It has also highlighted core aggregate economic loss from different forestry operation that need to be monitored so that such economic resources can be channeled toward improvement of rural and urban livelihoods of the citizenry;

Finally, the study has exposed ways to help ensure better sustainable forest management practices within the study area and the country as a whole.

Suggestions for Further Research

The following areas are suggested for further studies:

- There is need for an in-depth study on the effect of deforestation and the coping strategies at the rural level in order to formulate integrated policy for optimal and efficient land use.
- It is also important to investigate the impact of macroeconomic variables and market failures on deforestation at community levels.
- There is need for a study on increasing civil society participation in shaping policy, management, implementation and monitoring of forest activities, to combat deforestation and indigenous tree extinction in the country.
- Finally, a study on household domestic energy consumption and utilization level of forest products is necessary.

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