EFFECTS OF URBANIZATION ON ALALUBOSA WATERSHED AND FUEL WOOD PLANTATION IN IBADAN SOUTH-WEST LOCAL GOVERNMENT AREA OF OYO STATE

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Abstract

Demographic pressure on urban forests, especially in Nigeria has reached an alarming rate such that most of the old urban forest reserves and enclaves have suffered more undue depletion and degradation with loss of bio-diversities and renewable resources. This study was carried out in the old Alalubosa watershed/fuel wood plantation located around Jericho, Aleshinloye in Ibadan South-West Local Government Area with the objectives of examining the current status of the old reserve, evaluate the estate in terms of vegetational structure, landscapes and the level of divergence from the original use of the land. This was achieved by zoning the area into four (4) and the data obtained were subjected to descriptive statistics. The results showed that the former Alalubosa watershed/ fuelwood plantation in which Forestry Research Institute of Nigeria (FRIN) used to have experimental plots of various indigenous and exotic tree species is now a shadow of itself. Major parts of the area is now occupied by residential buildings with a big shift from the original vegetation structure of the study location as total disappearance of indigenous plant species were observed in all the zones. For instance, tree species of high economic value like Milicia excelsa and Triplochiton scleroxylon; shrubs e.g Icacina trichanta, Senna fistula, Senna podocaarpa, Allophyllus africannus and Kalotropis procea can no longer be found in the location. Instead, the environment (all the zones) is now dominated with buildings, scanty trees and noticeable proportion of ornamental plants. The current landscapes of the area are predominantly hedges and hard interlocking tiles. Therefore, it could be concluded that the old Alalubosa forest reserve has suffered total deforestation as a result of urban encroachment, commercial activities, infrastructural development and resettlement. In order to ensure better vegetation cover of the area despite the encroachment, it is recommended that there should be proper enlightenment and education of the occupants of the area on the importance of trees to their immediate environment and thereafter, encouraging the inhabitants to plant at least two trees within their compound thus ensuring environmental stability.

Keywords: Forest Plantation, Vegetation Structure, Watershed Landscape, Fuel wood

Introduction

Forest is one of the natural resources which God endowed the human race with. Forest is regarded as a vital and fundamental component of any ecological system and for long it has provided answers to the basic needs of man such as shelter, food and clothing (Adebayo *et al.*, 2002). The importance of this is based on the various tree species and non-timber forest produce. It is for this purpose apart from timber and raw materials for industries that plantations of tree species are being established. The benefits of forest range from quantifiable to unquantifiable, both of which have considerable impact on human welfare. The quantifiable benefits are measured in terms of economic values and financial returns such as the use of timber for construction works for infrastructural developments like roads, industries, buildings, furnitures etc. while unquantifiable benefits of forests vary from watershed management, regulation of water regime, prevention of soil, water and wind erosion; climate amelioration, aesthetic value, among others.

According to Umeh (2002), prior to the advent of the colonialists, this country was beautiful and was environmentally conducive for healthy living. However, the rate of urbanization in Nigeria in the last two to three decades has been so rapid as a result of relatively improved standard of living. This has led to erection of several structures and other forms of construction within the metropoleis. The process of urbanization involves the clearing of forest of the topography for establishment of play grounds, transport routes, gardening, construction of gutter, change in draining patterns and channelizing of stream segment etc. (NEST, 1991). Destruction of urban forest and watershed particularly in South-Western Nigeria has become widespread contributing immensely to further deterioration of urban life. The increasing demand for land due to the quest for urbanization in Ibadan has led to deforestation of the city's forest reserve and watersheds especially Alalubosa forest reserve (Yussuf, 2002). The aspects of urbanization, which have significantly altered forest biodiversity and hydrological process, include the establishment and expansion of cities, and the accompanying activities of man within the city environment.

One of the big cities that have witnessed such rapid urbanization is Ibadan [Lat. $7^0 23^1$N, Long. $3^0 56^1$E] (Adelusi *et al.,* 2002). For instance, the city which experienced mean annual temperature of $24\text{-}28^0$C about 20 years ago recently recorded $30\text{-}35^0$C according to FRIN Meteorology record of 1999. These changes no doubt have greatly modified the overall environmental conditions of the city. Ibadan which had between with 7-10 well protected forest reserves between 1960 and 1980 has lost at least 4-5 of these reserves to urbanization mostly replaced with housing estates and other forms of activities (Adelusi *et al.*, 2002). According to Adelusi *et al.* (2002), the general trend in urbanization and de-reservation in Ibadan is similar to what is going on in other large cities in the country.

Urbanization through the deforestation process reduced the size and depth of the Eleyele water and eliminated the cherished Alalubosa forest reserves/lakes (Kareem, 2002). Alalubosa is a major vegetal area which is located in Ibadan metropolis that witnessed a very sharp deforestation and the entire area built up for urbanization thus causing flooding (Oguntala, 1995). Based on the above background, this paper examined the current status of the forest estate, evaluated the estate in terms of structures, landscapes, trees, shrubs, ornamental plants and other developmental activities viz-a viz assessment of the level of divergence from the original use of the land.

Methodology
Alalubosa watershed area is located in Ibadan South-West Local Government Area, Ibadan, Oyo State. It is located on Long. $3^0 51^1 48.74^1$E and Lat.$7^0 23^1 11.68^{11}$N. The topographic and the land area of which Alalubosa watersheds area covers about 312.27 hectares of land (Adelusi *et al.*, 2002). Alalubosa drainage channel was occupied by Odo-Ona river which was drained by Araromi/Asangbogbe and Alalubosa Amunifona streams. The study area enjoys two distinct seasons namely; the rainy and dry season. The rainy season is between April to October and dry season is between November to March. The dry season is also characterized by dry dust winds originating from Sahara's desert and experiences occasional low rainfall. The maximum temperature of the area is 26.46^0C while the minimum temperature is 21.42^0C and the relative humidity was 74.55% in 1995 (Oguntala, 1995), while it is now between 26^0C-34^0C and relative humidity of 80% (FRIN Met. Station, 2016). The geology was moderately undulating, underlying a ferruginous rock on crystalline acidic rocks of undifferentiated basement complex (pre-cambrian) intruded by granites. The steep slopes expect near the top of several hills, ridges rising above the valleys. The streets in the study area were zoned into four (4), namely: Zone A (Trans motel, Oladele Street), Zone B (Vine way, Forest Hill estate), Zone C (Palm way) and Zone D (Zion Street). This was done in order to make the field survey easy and identifiable. Enumeration/assessment of the structures and the landscape of the area in each easily sighted/visible compound of the zoned areas were done in terms of buildings, trees, shrubs, landscape and other developmental activities so as to know the current status of the study area. Although, the study was limited by the fact that many of the residents within the study area were not readily assessable probably due to the nature of their job and coupled with the tight security around their houses, hence total enumeration could not be conducted. The assessment also involved personal communication with some of the residents. The collected data from the field were supported with secondary data from the literatures and other relevant sources such as official records of Forestry Research Institute of Nigeria for historical information. The data collected were analyzed using descriptive statistics.

Results and Discussion

Table 1: Vegetation Structure of the Study Area

S/N	Tree	Shrubs	Ornamental
	ZONE A		
1.	*Gliricidia sepi um (4)* (Quick stick)	*Thuja occidentalis (26)* (Northern white cedar)	*Cycas revolute (10)* (Sago palm)
2.	*Azadirachta indica (27)* (Neem)	*Euphorbia milli (6)* (Crown of thorns)	*Duranta repens (9)* (Sky flower)
3.	*Eucalyptus camaldulensis (2)* (River red gum)	*Newbouldia leavis (3)* (Akoko)	*Ixora spp (6)* (Viruchi)
4.	*Terminalia catappa (6)* (Almond)	*Cornus mas (2)* (Cornelian cherry)	*Ficus spp (6)* (Gastropod)
5.	*Terminalia radii (4)* (Madagascar almond)		*Polyalthia longifolia (18)*(False ashoka)
6.	*Moringa olifera (15)* (Drumstick)		*Syagrus romanzoffiana (4)* (Queen palm)
7.	*Elaeis guineensis (21)* (African oil palm)		
8.	*Mangifera indica (10)* (Mango)		
9.	*Citrus spp (5)* (Orange)		

10.	*Cocos nucifera (2)* (Coconut)		
11.	*Anacardium occidentalis (7)* (Cashew)		
	ZONE B		
1.	*Anacardium occidentalis (6)* (Cashew)	*Thuja occidentalis (20)* (Northern white cedar)	*Ixora spp (12)* (Viruchi)
			Cycas revolute (9) (Sago palm)
			Duranta repens (12) (Sky flower)
			Polyalthia longifolia (9) (False ashoka)
	ZONE C		
	Terminalia catappa (2)(Almond)	*Thuja occidentalis (20)*(Northern white cedar)	*Delonix regia (7)* (Flame tree)
	Anacardium occidentalis (4) (Cashew)		*Cycas revolute (7)* (Sago palm)
			Ixora spp (9)(Viruchi)
			Eugenia uniflora (7)(Pitanga)
			Duranta repens (10) (Sky flower)

Table 1 showed the vegetation structure of the old Alalubosa watershed plantation. Vegetation structure is the overall morphology and architecture of a plant community, such as the vertical layers of plants of different heights in an agroforestry system, the presence/absence of gaps in the forest canopy, or the horizontal spacing of individual plants (USDA, 2014). A total of eleven (11) different types of tree species were identified in Zone A of which majority of them were fruit trees (7). It could be inferred that if not that the occupants have high taste or value fruits; one may rightly say there would not have been any tree left in the zone over time. In Zone B, only one tree species was identified (*Anacardium occidentalis*). Although in this zone, there were some hindrances that impeded the assessment such as tall walls/fence. Zone C also had very limited tree species (1) while in Zone D, a total of four tree species were identified in which three of them were fruit trees.

Generally, in the study area it was observed that trees of high economic importance were no longer in existence. For instance, trees like *Milicia excelsa* or *Triplochiton scleroxylon* were not sighted at all. FRIN (1971) reported the presence of some trees of high economic value in the study area in the past to be included *Triplochiton scleroxylon, Tectona grandis, Pinus caribean, Milicia excelsa, Chrysophyllum albidum, Cedrela odorata, Gmelina arborea, Cassuarina equsetifolia and Casia siamea.* It is very pathetic that those trees of high economic value identified by FRIN (1971) before the deforestation of the area are no longer in existence. The Fuel wood plantation in the past was a major urban forest reserve but today has less than 3% of its original forest cover left, as a result of urban encroachment and commercial activities (Adelusi, 2002). The 'Alesinloye' market occupies about 40% of the total area, while agriculture and gravel collection accounted for the remaining 10-20% and the rest for private residential accommodation (NEST, 1991). The table also revealed that there was high preference for fruit trees by the occupants and this can be traced to the fact that majority of the dwellers are educated and appreciate the importance of fruits in human nutrition. The study (Table 1) also revealed that from Zone A to D, only four (4) different types of shrubs were observed in which *Thuja occidentalis* predominates in all the zones. According to some historical information provided by FRIN, Some certain shrubs found in the study location before deforestation of the area like *Icacina trichanta*, *Allophylus africannus* and *Kalotropis procera* no longer exist. The loss of these shrubs is one of the impact of the urban encroachment on the study area, although appreciable number of ornamental plants grown in various compound in the area indicates that the area occupants had flair for environmental beautification with flora.

Table 2: Current Landscapes of the Study Area

Zone	Grasses	Hedges	Kerbs	Granites
Zone A		√	√	√
Zone B	-	√	√	√
Zone C	√	√	-	-
Zone D	√	√	-	-

Source: Field Survey, 2017

Table 2 showed the different landscapes currently found in the study area in which hedges feature prominently in all the zones than other landscapes. From an ecological perspective, a landscape is a mosaic of interacting ecosystems (at any scale); an area spatially heterogeneous in at least one factor of interest (MCGarigal, 2002) while a hedge or hedgerow is a line of closely spaced shrubs and sometimes trees, planted and trained to form a barrier or to mark the boundary of an area, such as between neighbouring properties (Wikipedia, 2019). When clipped and maintained, hedges are also a simple form of topiary. The preference for hedges may be traced to a number of factors but with utmost intention of beautification. The current developmental activities in the area in terms of erection of residential buildings and environmental beautification are responsible for the types of landscapes observed.

Conclusion and Recommendations

This study established the fact that the old Alalubosa forest reserve/ fuel wood plantation has suffered total deforestation as a result of urban encroachment and commercial activities through the erection of buildings and other commercial infrastructures which have seriously affected the water catchment and research activities in which the area was being used for in the past. It is therefore necessary for the government of Oyo State to educate the occupants of the area on the importance of trees to their immediate environment. Thereafter, they should also encourage/ mandate the inhabitants of the area to plant at least two trees within their compounds so as to ensure environmental stability of the area.

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