International Scholars Journals

African Journal of Wood Science and Forestry ISSN 2375-0979 Vol. 13 (2), pp. 001-006, February, 2025. Available online at www.internationalscholarsjournals.org © International Scholars Journals

Full Length Research Paper

Ecological and Economic Significance of Vegetation at the Proposed Airport Site in Delta State, Nigeria

O. M. Agbogidi

Department of Forestry and Wildlife, Faculty of Agriculture, Delta State University, Asaba Campus, Asaba, Delta State, Nigeria. E-mail: omagbogidi@yahoo.com. Tel: +2347038679939, +2348056306219.

Accepted 19 October, 2024

This study assessed the economically valued forest trees and shrubs at the proposed site for an airport in Asaba, Delta State with a view to noting them before the commencement of work in the area. 2520 × 20 m quadrants were laid randomly along the five 1 km line transect and assessed accordingly. Thirty tree species producing various economically valued products were assessed and 10 out of the 33 were observed to be rare while 23 were abundant. Fifteen species of shrubs were assessed out of which, 8 were identified as abundant and rare (3). Products collected from these plants have varying use categories as leafy vegetables, edible and medicinal fruits, leaves, seeds, barks, fodder, poles, timber, stakes and chewing sticks. 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 plant and animal species. It is strongly recommended that domestication of indigenous tree and shrub species should be encouraged and supported. Conservation efforts, through the establishment of nature reserves, botanical gardens, sacred grooves, sanctuaries, rare breed centers, game banks and on-site gene banks should be supported to enhance sustainability.

Key words: Forest trees, shrubs, proposed site, airport, Asaba, Delta 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 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 (Aimufia, 2002).

The importance of forest 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 in his old age, and the coffin or casket in which he returns to Mother Earth are forest dependent. Abu and Adebisi (2002) stated that the traditional uses of forests are basically for subsistence, income, environmental and social/ culture. Agbogidi and Eshegbeyi (2008) maintained that forests are often called the lungs of the earth for their role in the contribution to carbon sequestration and other global ecological services yet, everywhere we look the lungs are gasping. Udo (2001) noted that forest benefits include; 1), tangible benefits: wood products and non-wood products and; 2) intangible benefits (Table 1). Etukudo (2000) emphasized that forests are man's divine treasure.

Aliyu (2006) stated that reasonable species of medici-nal species are threatened with habitat loss following heightened deforestation (Agbogidi, 2002; Agbogidi and Ofuoku, 2006). Although there is great incompatibility in urbanisation/industrialisation and agriculture, develop-mental activities should be environmentally friendly to

Table 1. Benefits of forests.

Benefits	Products/Uses
Tangible benefits	a) Wood products: Saw logs, veneer logs, pulpwood, poles, match wood, chew sticks, yam stakes etc. b) Non-wood products: Leaves, forage, fruits and seeds, medicinal herbs, tannins (dyes), latex, resins, gums, canes/ rattans, laterite, honey, mushrooms, wildlife.
Intangible benefits	a) Environmental/ protection: Soil protection against erosion, purification of air, protection of houses against windstorm, protection of water catchments, provision/ protection of wildlife habitats, windbreak against desert encroachment, cooling of the environment, protection of plants, animals and man against excessive sunrays, regulation of drought and flood, amelioration of climate, harbour unique genetic resources. b) Nutrient and hydrological cycles: Helps in nutrient cycling to improve soil fertility, contribute to hydrological cycle, control of semi-metals of downstream bodies and control of ground water recharge. c) Aesthetics and education: Beautification of avenues and improvement of landscape, research ground on biodiversity, provision of tourism and recreational facilities.

Source: Etukudo (2000); Udo (2001); Agbogidi and Eshegbeyi (2008).

allow for sustained yield (Agbogidi and Okonta, 2009). Anthropogenic activities including farming, hunting, tree felling, bush burning, mining operation, petroleum exploitation, civil engineering construction and water exploration have been shown to impact on the forest negatively (Adeyemi and Jegede, 2002). Adelusi et al. (2002) noted that urban forest reserves and enclaves have suffered more undue depletion and degradation with loss of biodiversity and renewable resources as a result of urbanization and encroachment on areas originnally perceived as forest reserves and estate. In the same vein, Okonkwo et al. (2002) reported that serious anthropogenic activities of man constitute great environmental hazards. 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 estates, company sites and stadia in Nigeria and other parts of the tropics, have led to the removal and destruction of various economic vegetation, with the use of some of these projects, yet to be discovered.

The link between the environment and development calls for an environmental impact assessment of a deemed large scale economic project that will impact on the generality of the populace and Asaba in particular. This study has been undertaken to assess the economically valued forest trees and shrubs on the proposed site for an airport in Asaba, Delta State with a view to noting them before their utter disappearance on the conversion of the area to an airport.

MATERIALS AND METHODS

The experiment was conducted at latitude 6 °14′N and longitude 6°49′E at the proposed site for the airport in Asaba, Delta State, Nigeria (Asaba Meteorological Office, 2008). The study was conducted in 2006 using line transects. Five 1 km line transects were laid at 150 m interval. The transects ran through forest and the surrounding farm fallow and 2520 × 20 m quadrants were points along each of the transects following the procedure of Olajide et al. (2006). Assessment of forest plant species and shrub species producing economically valuable products subsequently followed. A total area of 10,000 m^2 was assessed along each transect which summed up to a gross total area of about 50 ha assessed. A plant species was classified as abundant or rare based on its frequency count in all the assessed quadrants. A plant species found in 40% and above of all the assessed quadrants was considered abundant while a species present in < 40% of all the assessed quadrants was regarded rare following the procedure of Olajide et al., (2006).

RESULTS AND DISCUSSION

Thirty three tree species producing various economically valued products were assessed (Table 2). 10 of the 30 trees species were observed to be rare while 23 species were abundant (Table 2). Fifteen species of the shrub species were evaluated and twelve were identified as abundant and three rare (Table 3). The economic products that are harvested or collected from these plant species include nuts, fruits, seeds, leaf vegetables , bark, leaves, fodder, chew sticks, poles, stakes, timber, juices, resins and dyes and have varying use categories such as medicine, food, local construction, craft as well as socio-cultural and environ-mental values (Agbogidi and Eshegbyi, 2008; Jimoh and Haruna; 2007; Idumah et al., 2008).

Over exploitation, exploration and utter conver-sion of forest ecosystems or other land use normally result in the decimation of biological diversity as well as extinction of many valuable plant and animal species (Agbogidi, 2002; Iroko et al., 2008). The reduced population densi-ties of the studied area testified to the fact that the studied area has been under intense exploitation for commercial value attributed mainly to man-influenced activities (anthropo-genic forces). The disappearance of many economically valued tree and shrub species across Nigeria is a well

Table 2. Economically valued tree species of the proposed Airport site in Asaba, Delta State.

S/No.	Botanical name	Common name	Total abundance (%)	Products	Uses	Ecological status
1.	*Juglaris nigra*	Walnut	24	Seeds	Food	Rare
2.	*Garcinia cola*	Bitter kola	59	Seeds	Food, medicinal	Abundant
3.	*Irvingia gabonensis*	Dikanut (ogbono)	20	Seeds/ fruits	Food	Rare
4.	*Alstonia boonei*	Awan/ Etinrim	73	Leaves/ bark	Medicinal	Abundant
5.	*Azadirachta indica*	Neem	67	Bark, roots, leaves	Medicinal	Abundant
6.	*Anthonata macrophylla*	-	17	Leaves	Food	Rare
7.	*Pentaclethra mcrophylla*	Oil bean	43	Fruits	Food, medicinal	Abundant
8.	*Monodora myristica*	African nutmeg	22	Seeds	Food, medicinal	Rare
9.	*Gambaya albida*	Cherry, udala	53	Fruits	Food, medicinal	Abundant
10.	*Treculia africana*	African bread fruit	51	Fruits	Food, medicinal	Abundant
11.	*Tetrapleutra tetraptera*	Aridan plant	48	Spice	Food, condiment	Abundant
12.	*Xylopia aethiopica*	Guinea paper	53	Spice	Food condiment	Abundant
13.	*Elaeis guinensis*	Oil palm	55	Fruits/ stem	Food/ wine	Abundant
14.	*Ricinus cummunis*	Castor oil	24	Fruits, leaves	Food, medicinal	Rare
15.	*Vitallaria parodoxa*	Shear butter	18	Roots, nuts, leaves	Leaf vegetable, medicinal	Rare
16.	*Prospis spp*	Locust bean	69	Fruits, roots	Food, fodder, medicinal	Abundant
17	*Bombax costatum*	Bombax	26	Leaves	Leafy vegetables, medicinal	Rare
18.	*Raffia hookerri*	Raphia palm	96	Wine	Wine	Abundant
19.	*Cola nitida*	Kola nuts	67	Fruits	Medicinal, stimulant	Abundant
20.	*Oxytenanthera albyssinica*	Bamboo	60	Stem	Craft/ construction	Abundant
21.	*Cocos nucifera*	Coconut	68	Fruits/ leaves	Food/ craft	Abundant
22.	*Milicia excelsa*	Iroko	27	Stem	Timber	Rare
23.	*Ficus capensis*	Opoto	47	Stem	Timber	Abundant
24	*Baillenolla toxisperma*	African pear wood	75	Stem	Construction, wood work medicinal	Abundant
25	*Glircidia sepium*	Glircidia	89	Leaves, stem	Green fodder construction, wood work	Abundant
26	*Leucaena leucocephala*	Leucaena	93	Leaves, stem	Medicinal, as soilconservation	Abundant
27	*Terminalia superba*	While Afara/ Limba	13	Root/ stem	Timber	Rare
28	*Mansonia altisoma*	Masonia	43	Stem	Timber	Abundant
29	*Laccosperma spp*	Stem, leaves	16	Rattan	Furniture/ basketry	Rare
30	*Eremospatha spp*	-	46	Rattan	Furniture/ basketry	Abundant
31	*Oncocalamus spp*	Stem, leaves	52	Rattan	Furniture/ basketry	Abundant
32	*Momordica charantia*	Ejinrin	48	Leaves and root	Medicinal	Abundant
33	*Tetracarpidum sp*	Okpa	64	Nuts, leaves	Food/ medicinal	Abundant

Source: Field survey, 2006.

Table 3. Economically valued shrub species of the proposed Airport site in Asaba, Delta State.

S/N	Botanical name	Common name	Total abundance (%)	Products	Uses	Ecological status
1.	*Annona muricata*	Sour sop	50	Fruit	Food, medicinal	Abundant
2.	*Moringa oliefera*	Micracle tree (dump stick)	53	Leaves	Fodder, medicinal	Abundant
3.	*Dennittia tripetala*	Pepper fruit	48	Fruit, root	Food, medicinal	Abundant
4.	*Vernonia amygdallina*	Bitter leaf	84	Leaves	Food, medicinal	Abundant
5.	*Dialinium guinenese*	Chew sticks	56	Stem/ fruits	Chew sticks, food	Abundant
6.	*Thaumatococus daniella*	Ewe iron	49	Leaves	Medicinal wrapping food	Abundant
7.	*Afzellia africana*	Apa	60	Root	medicinal	Abundant
8.	*Landophira dulcia var barteri*	Ischeku	64	Fruits	Food, dyes	Abundant
9.	*Myrianthus arboreus*	Ujuju	35	Leaves	Food/ medicinal	Rare
10.	*Alcohornea macrophylla*		27	Leaves	Fodder	Rare
11.	*Laphira lanceolata*	Chew sticks	64	Stem	Stake, mouth wash	Abundant
12.	*Laphira lanceolata*	Chew sticks	62	Stem	Mouth wash medicinal	Abundant
13.	*Ocimium gratissimum*	Scented leave/ curry	87	Leaves/ tender stems	Food, medicinal	Abundant
14.	*Jatropha gossypipolia*	Hospital too far	34	Exudates, leaves, roots	Medicinal	Rare
15.	*Carpolobia lutea*		58	leaves	Medicinal	Abundant

Source: Field survey, 2006.

known phenomenon (Agbogidi and Ofuoku, 2006; Adekunde and Akinlemibola, 2008; Olajide et al.,2008; Sale et al., 2008). The effects of defore-station for various reasons are equally evident (Adeyoju, 2001; Adeyemo and Jegede, 2002; Agbogidi, 2002; Aju, 2002; Foskett and Foskett, 2004; Omotoyinbo and Kayode, 2008). If forests are indiscriminately depleted, the various roles associated with them would be lost. For example, there will be prevalence of food insecurity, environmental problems would be on the increased as there will be heightened climate change resulting in reduced immunity and outbreak of various diseases leading to eventual death of organisms including the species called man as emphasized by Nwoboshi (2001) that when the last tree on planet earth dies, the man dies also.

There is an ultimate need for conservation of biodiversity (Foskett and Foskett, 2004), the goal for sustainable development (Agbogidi and Okonta, 2009). The 10 rare species of the forest observed in the studied area could be as a result of over exploitation and exploration of the forest ecosystem. As observed in the studied area, there is already over exploitation of economically valued trees and shrub species. On conversion to an airport, most of the remaining species will be definitely lost. Domestication of indigenous tree and shrub species is advocated both for poverty alleviation in rural communities like Asaba and for a balance to be maintained in the ecosystem (Oregbeme, 2005; Jimoh and Haruna, 2007; Kuponiyi, 2007). Similar views have been shared by Popoola and Oluwalana (1998), Popoola (2002) Anamayi et al. (2005) and Olufemi and Akinlosutu (2006). Planting of edible and medicinal forest plant species in Asaba should be strongly encouraged and supported with the inhabitants of area with strong incentives from government such as supplying of seedlings, seeds and employment of the people. Nature reserves, groves and sanctuaries should be established in the area to enhance conservation strategies and to ensure sustainability.

Conclusion

This study assessed the proposed site for the airport in Asaba, Delta State for forest tree and shrub species which produce economically valued products. Out of the 33 tree species assessed, 23 were abundant while 10 were rare with 12 species

being abundant and 3 rare among the 15 shrub species assessed. Over exploitation and exploration of the species were reportedly evident. The study established that at the commencement of the airport following utter conversion, very many species of trees and shrubs with economically valued products will be extinct. There is need to encourage and support the multiplication and domestication of indigenous species. Conservation efforts through the establishment of nature reserves, botanical gardens, sacred groves, sanctuaries, rare breed centers, game banks and on-site gene banks should be supported to enhance sustainability.

REFERENCES

Abu JE, Adebisi LA (2002). A review of traditional forest uses. *In:* Popoola, (ed.). Proceedings of a National Workshop organized by FANCONSULT and Edo State Chapter of FAN held in Benin-city, Edo State between 5th and 6th of September, 2002, pp. 42-50.

Adekunle VAJ, Akinlemibola O (2008). Effect of deforestation of climate change and global warming in Nigeria. *In:* Popoola, L. (ed.). Proceedings of the 32nd Annual Conference of FAN held in Umuahia, Aba State, Nigeria between 20th and 24th October, 2008, pp. 170-182.

Adelusi HM, Agboola OD, Oni PI (2002). Urbanisation: implication for forest resources depletion and environmental management in Nigeria. *In*: Abu JE, Oni PL, Popoola L (eds.). Proceedings FAN held in Akure, Ondo State, Nigeria between 4th and 8th of November 2002, pp. 69-79.

Adeyemo AI, Jegede G (2002). Effects of anthropogenic actives on Nigerian environment. *In*: Abu JE, Oni PL, Popoola L (eds.). Proceedings FAN held in Akure, Ondo State, Nigeria between 4th and 8th of November 2002, pp. 89-93.

Adeyoju K (2001). Forestry for national development: a critique of the Nigerian situation. *In*: Popoola, (ed.). Proceedings of a National Workshop organized by FANCONSULT and Edo State Chapter of FAN held in Benin-city, Edo State between 5th and 6th of September, 2002, pp. 55-84.

Agbogidi OM, Ofuoku AU (2006). Biodiversity conservation and poverty alleviation in the Niger Delta area of Nigeria. Agriculturea Conspectus Scientifiucs, 71(3): 103-110.

Agbogidi OM, Eshegbeyi OF (2008). Forestry development for a safe environment. *In:* Onykwelu JC, Adekunle VAJ, Oke DO (eds.). Proceedings of the 1st National Conference of the Forests and Forest Products Society of Nigeria (FFPN) held at the Federal University of Technology, Akure, Ondo State between 16th - 18th April, 2008, pp. 95-98.

Agbogidi OM, Okonta BC (2009). Conservation of biodiversity: the goal of sustainable development. Afr. J. Agric. Res. Dev., (In press).

Agbogidi OM (2002). Deforestation and the Nigerians rural environment. *In*: Ibitoye OA (ed.). Rural environment and sustainable development. Petoa Educational Publishers, Ado-Ekiti, pp. 230-234.

Agbogidi OM, Ofuoku AU (2007). Promoting environmental protection in Nigeria through environmental education: the role of woman. J. Environ. Ext., 6: 28-33.

Aimufia DI (2002). Forests, people and the environment: a keynote address. *In*: Popoola, (ed.). Proceedings of a National Workshop organized by FANCONSULT and Edo State Chapter of FAN held in Benin-city, Edo State between 5th and 6th of September, 2002, pp. 5-14.

Aju PC (2002). The potential role of urban forestry in environmental management in Nigeria. *In:* In: Abu JE, Oni P, Popoola L (eds.). Proceedings of the 28th annual conference of FAN held in Akure, Ondo State between 4th and 8th and of Nov., 2002, pp. 89-93.

Aliyu BS (2006). Some ethno-medicinal plants of the savannah region of West Africa: description and photochemical. Triumph Publishing Company Ltd, Kano.

Anamayi SE, Anamayi RM, Bamikole JA, Thomas T (2005). Contribution of locust bean fruit to household food security and poverty alleviation among rural dwellers of Igabi Local Government Area of Kaduna State. *In:* Popoola, L., Mfon, P. and Oni. P.I. (eds.). Proceedings of the 30th Annual Conference of FAN held in Kaduna, Kaduna State, Nigeria. Between 7th and 11th November, 2005, pp. 325-334.

Asaba Metrological Station (2008). National meteorological report. *In*: Meteorological Bulletin (2008) Lagos, Nigeria.

conference of FAN held in Akure, Ondo State between 4th and 8th and of Nov., 2002, pp. 89-93.

Etukudo I (2000). Forests: our divine treasure. Dorand Publishers, Uyo.

Foskett N, Foskett R (2004). Conservation. Cox and Wyman Ltd, Reading.

Idumah FO, Onyeanusi AE, Ajayi CA (2008). Non –timber forest resource and sustainable livelihood in a rural economy. *In:* Onykwelu JC, Adekunle VAJ, Oke DO (eds.). Proceedings of the 1st National Conference of the Forests and Forest Products Society of Nigeria (FFPN) held at the Federal University of Technology, Akure, Ondo State between 16th - 18th April, 2008, pp. 257-261.

Iroko OA, Kareem AA, Adio AF, Gbadebo JO (2008). Impact of human activities on the forest and their effects on climate change. *In:* Popoola, L. (ed,). Proceedings of the 32nd Annual Conference of FAN held in Umuahia, Abia State, Nigeria between 20th and 24th October, 2008, pp. 208-214.

Jimoh SO, Haruna EA (2007). Contribution of non-timber forest products to household food security and income around Onigabari forest reserve in Oyo State, Nigeria. J. Environ. Ext., 6: 34-37.

Kuponiyi FA (2007). Socio-economic importance of non-timber forest products among rural residents of Shaki agricultural zone of Oyo State, Nigeria. J. Environ. Ext., 6: 34-38.

Nwoboshi LC (2000). The nutrient factor in sustainable forestry. University Press, Ibadan.

Okonkwo MC, Umar G, Nwafor OE (2002). Forest resources depletion and the national economy. *In*: Abu JE, Oni PL, Popoola L (eds.). Proceedings FAN held in Akure, Ondo State, Nigeria between 4th and 8th of November 2002, pp. 94-100.

Olajide O, Apejoye F, Chukwuma B (2006). A survey of economically valued forest trees and shrubs at the proposed site for airport in Akwa Ibom State, Nigeria. *In*: Popoola, L. (ed.). Proceedings of the 31st Annual Conference of FAN held in Makurdi, Benue State, Nigeria between 20th and 25th November, 2006, pp. 203-208.

Olajide O, Udofia O, Etigale EB (2008). Consequences of tropical rainforests destruction on the climate and physical environment. *In:* Popoola, L. (ed,). Proceedings of the 32nd Annual Conference of FAN held in Umuahia, Aba State, Nigeria between 20th and 24th October, 2008, pp. 23-28.

Olufemi B, Akinlosutu MO (2006). Contribution of non-wood forest products to the socio-economics of rural dwellers in Idanre, Ondo state, Nigeria. *In:* Popoola, L, (ed.). Proceedings of the 31st Annual conference of FAN held in Makurdi, Benue state, Nigeria between 20th and 25th Nov. 2006, pp. 516-526.

Omotoyinbo MA, Kayode J (2008). Checklist and conservation status of chewing stick plant species in Ekiti State, Nigeria. *In:* Onykwelu JC, Adekunle VAJ, Oke DO (eds.). Proceedings of the 1st National Conference of the Forests and Forest Products Society of Nigeria (FFPN) held at the Federal University of Technology, Akure, Ondo Statebetween16th-18th April, 2008.

Oregbeme AO (2005). Propagation and cultivation of economic non timber forest product and fruit trees a possibility for poverty alleviation in rural communities in Edo State. *In*: Orheuata AM, Nwokoro SO, Ajiayi MT, Adekunle AT , Asumugha GN (eds.). Proceedings of the 39th Annual Conference of the Agricultural Society of Nigeria held at the University of Benin, Benin-city, Edo State between October 9 and 13, 2005, pp. 242-245.

Popoola (2002). Reducing poverty through non-timber forest products in Nigeria. *In*: Folusu, O. (ed.). Poverty reduction and the Nigeria agricultural sector. Elshaddai Global Ventures Ibadan. pp: 77-90

Popoola L, Oluwalana SA (1998). Marketing of non-timber forest products in Nigeria. *In:* Adeola, A.O., Okojie J, Ojo LO (eds.). Proceedings of colloquium on biodiversity of the rain forest and ecosystem of Nigeria Organized by FEPA-UNANB linkage centre for

forest, conservation and biodiversity between 8th and 10th December, 1998, pp. 33-37.

Sale FA, Samuel D, Ayo-Odifiri OS (2008). Effects of climate change on biodiversity. *In:* Popoola, L. (ed,). Proceedings of the 32nd Annual Conference of FAN held in Umuahia, Abia State, Nigeria between 20th and 24th October, 2008, pp. 202-207.

Udo ES (2001). The position of forestry in Awa Ibom State. *In*: Udo, E. S. (ed.). Proceedings of the 1st workshop of the Forestry Association of Nigeria Akwa Ibom State Branch in collaboration with the Department of Forestry and Wildlife, University of Uyo, State Ministry of Environment and the UNDP, Akwa Ibom State held in Uyo, Akwa Ibom State between 10th and 11th April, 2001, pp. 31-43.