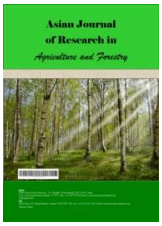

Asian Journal of Research in Agriculture and Forestry

6(3): 31-40, 2020; Article no.AJRAF.58263
ISSN: 2581-7418

Factors Affecting Timber Production in Akwa Ibom State (Nigeria) and the Way Forward

N. E. Esiere[1*], N. B. Ndulue[2] and M. P. Akpan[1]

[1]Department of Forestry and Wildlife, University of Uyo, Akwa Ibom State, Nigeria.
[2]Department of Forestry and Wildlife Management, Faculty of Agriculture, Nnamdi Azikiwe University Akwa, P.M.B. 5025 Awka, Nigeria.

Authors' contributions

This work was carried out in collaboration among all authors. Author NEE designed the study, performed the statistical analysis and wrote the first draft of the manuscript. Author NBN wrote the protocol and managed the analyses of the study. Author MPA managed the literature searches. All authors read and approved the final manuscript.

Article Information

DOI: 10.9734/AJRAF/2020/v6i330107
Editor(s):
(1) Dr. Md. Abiar Rahman, Bangabandhu Sheikh Mujibur Rahman Agricultural University, Bangladesh.
(2) Dr. Hamid El Bilali, Mediterranean Agronomic Institute of Bari, Italy.
(3) Dr. Lucia Bortolini, University of Padova, Italy.
Reviewers:
(1) Deepak Kumar Ojha, Goethe University, Germany.
(2) Biswajit Mondal, ICAR-National Rice Research Institute, India.
Complete Peer review History: http://www.sdiarticle4.com/review-history/58263

Review Article

Received 28 May 2020
Accepted 05 August 2020
Published 15 August 2020

ABSTRACT

In Akwa Ibom State, timber is used for building, construction, furniture making, transmission pole, pulp and paper, and chemicals. Timber harvesting, processing and utilization had remained a big business to quite a number of people with its attendant forest destruction and deforestation. The State was richly endowed with forest resources, which are of great benefit to man but the high demand and continuous harvesting of timber products in the State ecosystems without any deliberate sustainable management programmes has resulted in the over-harvesting and complete devastation of the standing stock of indigenous wood species. In addition, indiscriminate exploitation of these resources has caused depletion of forest leading to serious timber deficit. This work has discussed factors affecting timber production in Akwa Ibom State and the way forward. The paper has identified deforestation and 'dereservation', overexploitation of forest resources, revenues target by government, population growth and infrastructure expansion, non-participation of the private sector in forest development, amongst others, as factors responsible for the decline

**Corresponding author: E-mail: neetsam@yahoo.com;*

of timber resources in the state. The paper recommends that reforestation and afforestation programmes, conservation of natural forests, private sector participation in forest management, adoption of agroforestry system and sustainable management of natural resources can improve timber production in the State.

Keywords: Timber production; deforestation; over-exploitation; timber resources; conservation; afforestation.

1. INTRODUCTION

Forest is a vegetation dominated by trees with interlocking branches. It is a stock of natural resources, which have diverse uses. Forest is a complex ecosystem consisting mainly of trees that buffers the earth and supports many life forms. Forest is defined as a continuous stand of trees with interlocking crowns, which have a height of 10 meters and above [1] A more comprehensive definition of forest is given by the society of American Foresters as an ecosystem characterized by more or less dense and extensive cover, often consisting of stands varying in characteristics such as species composition, structure, age, class and associated processes and commonly include meadows, streams, fish and wildlife. [2] added that for a land to be regarded as a forest, it must be extensive at least 0.50/ha, with at least 10% canopy cover and tree height of not less than 5 m (or 7 to 10 m average, in some countries, the average height is 12 m) at maturity.

United Nations Reducing Emission from deforestation and forest degradation shows that Nigeria's forest estate which stood at over 9.6 million hectares constitutes about 10% of Nigeria's land area. The estimate falls below Food and Agricultural Organisation (FAO) recommended national minimum of 25%. The tropical rainforest has been estimated to cover about 4 billion hectares, which is almost one-third of the earth's surface [3] and has been adjudged the most biologically diverse ecosystem on earth [4,5].

Forests are known to be a store house of numerous resources which are very beneficial to humans especially people living within and around the forest. It provides tangible and intangible benefits [6,7]. [8] estimated that about 1.095 to 1.745 billion people benefit from forest resources globally and in Nigeria, about 71.576 million to 110.896 million people get direct and indirect benefit from the forest. Forests provide fruits, nuts, seeds, roots, pulpwood, income, fuelwood, vegetables, fodder, gums, mushrooms, snails, medicinal plants, timber, poles and wildlife resources [9,10,11,12,13]. According to [13] more than two billion people depend on wood energy for cooking and preserving food globally. Africa accounts for more than one-quarter of global wood fuel production and Nigeria produced 13% of Africa's fuel wood in 2006 [14]. In Nigeria, as in many other developing countries, fuelwood is the main source of energy, and the forest is the major source [9,15]. The volume of fuel wood removed in Nigeria from the forests, for instance, increased from 59.1 million m^3 in 1990 to 70.44 million m^3 in 2005, while that of industrial round wood increased from 9.23 million m^3 to 10.83 million m^3 within the same period (mongabay.com). [16] reported that in Mbo Local Government Area of Akwa Ibom State, 90% of total local energy requirement was from fuel wood and average per capita production rate and average consumption rate were 0.38 m^3 and 0.36 m^3 respectively. According to [17], fuel wood trade is a popular part time employer of rural labour especially during the off-season, and the trade is booming because household prefer fuel wood to other types of domestic energy in view of its availability, accessibility, affordability, source reliability and flexibility. Forests also provide raw materials from wood needed for the production of charcoal, chewing sticks, tooth-picks, match-sticks, wooden furniture and wooden handles for metallic tools.

There is an internationally growing concern over rainforest destruction. An estimate of 10.16 million hectares of tropical forest was permanently destroyed each year in the period from 2000 to 2005 and increasing over the 1990-2000 period [10]. Worldwide, deforestation received the greatest blame for all forest destructions as it had led to rapid depletion and continuous decline in supply of forests products. Also anthropogenic activities including farming, hunting, tree felling, bush burning, mining operation, petroleum exploitation, civil engineering construction and water exploration have been shown to impact the forest negatively [18]. [19] noted that urban forest reserves and

enclaves have suffered more and undue depletion and degradation with loss of biodiversity and renewable resources because of urbanization and encroachment on areas originally perceived as forest reserves and estate. In the same vein, [20] reported that serious anthropogenic activities of man constitute great environmental hazards. It is unfortunate that the biologically and economically rich forest of the state is fast disappearing due to unsustainable harvesting of timber resources resulting in loosing of many valuable forest resources. Forest in Akwa-Ibom State have been over-exploited due to high demand for forest resources, and population increase, these have resulted in extinction of some valuable species of timber. All these have caused the decline in the continuous supply and increase in the price of timber.

This study seeks to examine factors that causes decline in timber production in Akwa Ibom State and also provides strategies for increasing timber production in the state. The findings of this study are expected to assist in increasing timber production in the State.

2. MATERIALS AND METHODS

This paper adopts the use of various qualitative approaches in understanding the factors affecting Timber production. This method enabled us to sieve out helpful information through the analyses of a wide database of research papers, academic journals and books on the topics related to forest products, timber production and factors affecting it. In our examination, we analyzed the various findings in academic journals and research papers. This analysis helped to sieve out relevant information on factors affecting timber production in Akwa Ibom State with reasoning and analytical thinking.

3. RESULTS

3.1 Timber Production in Nigeria

The demand for timber for different purposes has put serious pressure on Nigeria's forest. [21] identified unregulated exploitation of the forests to supply of timber as a major source of pressure on Nigeria forests. Timber harvesting had remained a big business to quite a number of people with its attendant forest destruction and deforestation. Timber harvesting has been going on in Nigerian forest ecosystem without any deliberate management programmes. High demand for timber products has resulted in the over-harvesting and complete devastation of the standing stock of indigenous hardwood species in Nigerian forests.

Timber is in high demand for different end-uses as in furniture making, veneer, plywood, sawn timber, particle board, pulp and paper, paper board, wood for energy (charcoal and fuelwood), among others. In Nigeria, the demand for wood products is increasing daily, while the supply of such products is decreasing. According to [22], demand for sawn wood alone based on current consumption is estimated at 1.2 million m^3 per year. This is expected to grow by 6-9% annually. [23] observed that losses of timber and fuelwood and other forest resources is about 700 million USD. The growing rate of depletion of forest resources through unsustainable productions of timber could lead to significant decrease of Nigerian trees.

3.2 Timber Production in Akwa Ibom State

Akwa Ibom State is made up of thirty-one local government areas. The State occupancies a total area of about 8,412 km^2 in the South-south geographical zone of Nigeria. It is between latitudes 4°3' and 5º30' N and longitude 7°27' and 8°27' E. The population is 3.9 million of people [24]. The favourable climatic condition of the state made it a rich zone in terms of flora and fauna. The state has easily discernable ecological zones: These are the mangrove swamp, the lowland rainforest and derived savanna. In forestry sub-sector of the state, the state land has been divided into forest reserves and protected forests. Timber and other forest resources are derived from both the forest reserves and the protected forests for use in the state. In Akwa Ibom State, timber products are important economics resources. These products include sawn wood, pulpwood and fuelwood. They are used in buildings as roofing, panel doors, and door frames, stair cases, making of canoes, tables, bed, wood carving and road construction.

It could be established from Table 1 that the total reserves have drastically reduced due to human activities such as illegal encroachment, illegal extraction of timber and conversion of the reserves to agricultural farmlands. Over the years, forest reserves have experienced a drastic reduction for other land-use practices. Most of

the reserves areas have been converted to other uses such as housing and oil company operational base.

The damage of the forests has led to the decline in timber products yield owning to population growth largely attributed to industrialization and urbanization. Sadly, the effective and focused forest plantation has been politicized for a very long time. [7] observed that forest plantation establishment trend was declining. He noted that in the last three years before 2001 (1998) virtually no forest plantation was established. In effect, there has been no forest plantation establishment from 2008 till now [25]. Plantation technology is dying, our timber resources have diminished rapidly as there is increasing demand for both building and for other purposes.

A report on forest resources in Akwa Ibom State sponsored by the African Development Bank for Forest Management Evaluation and Co-ordinating Unit (FORMECU) indicated that for any given year, the timber supply and demand balance for the state from 1999 to 2005 would be in deficit (Table 2). The study clearly shown that the deficit trend in timber production will keep on increasing, and the productive capacity of the timber from both natural and plantation forests will not meet the demand of increasing population in the State. These balances were arrived at by subtracting productive supply in any given year in both Natural and Forest Plantation in the State from the product demand for the State. The negative value occurred because wood supply in the State is less than the demand.

FORMECU [26] recorded the trend in the demand for wood for the period 1999-2010 (Table 3). It was observed that the demand for wood is increasing. It also showed an increasing exploitation of wood and the rate at which the forest is being exploited. According to [27] the study of wood demand and supply in Akwa Ibom State reveals a situation which is both pathetic and worrisome for a state whose cities and infrastructures are fast expanding with high demand for wood products. Based on available demand and supply figures, Akwa Ibom State has experienced wood deficit of about 2.51 million cubic meters which increased to 2.57 million cubic meters by 2010 [27].

Stakeholder in forestry is quite aware of the low record of forest natural regeneration process to fulfill the wood requirement of our rapidly increasing population. In order to improve on the situation of timber production in the state, there is need for renewability of forest products through different forestry practices.

4. DISCUSSION

Discussion on timber production in Akwa Ibom State will concentrate on two major areas. These include factors responsible for the decline of timber production and strategies for increasing the production of timber.

4.1 Factors Responsible for the Decline of Timber in Akwa Ibom State

Timber resources in Akwa Ibom State have diminished rapidly as there is increasing demand for both building and for other purposes. For any given year, the timber supply and demand balance for the state would be in the deficit. The deficit trend in timber production will keep on increasing and the productive capacity will not meet the demand of the increasing population. Akwa Ibom State has been and will continue to be in a deficit situation about timber production. Certain factors may likely make the deficit situation continue well into the future.

Factors that caused deficit in timber production are summarized as follows:

4.1.1 Deforestation and de-reservation

Deforestation is the removal or destruction of forest vegetation cover for any purposes, without replacement or regeneration and de-reservation as the act of putting a forest reserve into use other than what it was gazetted for during its constitution into a forest reserve [7]. Despite the limited forest areas in the state, forests are being converted to other forms of land use such as agriculture, infrastructure and road construction. Deforestation contributes to the loss of important timber species and many timber products are now endangered and threatened with extinction while a good number of them are extinct. Available evidence confirms that the forest estate of Akwa Ibom State has suffered both deforestation and degradation over the years [28]. The state has accordingly lost parts of its rainforests like the Ogu Itu, which has been completely deforested and now is a wasteland. The Stubbs Creek Forest Reserve has seriously been degraded too, while sheet and gully erosion has devastated many parts of the state [27]. However, the rate at which forests in the state are being exploited has resulted in deficit of timber production.

Table 1. Forest reserves in Akwa Ibom State

S/N	Name of forest reserve	Area (km^2)	Location (LGA)	Remarks
1	Stubbs Creek Forest Reserve	310.80	Esit Eket, Mbo and Ibeno	Constituted in 1930
2	Ogu Itu Forest Reserve	5.18	Ini	Constituted in 1929
3	Obot Ndom Forest Reserve	2.59	Ini	Constituted in 1929

Total Area at Constitution 318.57 Km^2, Source: Forestry Directorate (2018)

Table 2. Timber supply and demand for Akwa Ibom State (M m^3/year)

Products	1999	2000	2001	2002	2003	2004	2005
Fuelwood	-1972045	-2003006	-2025708	-2052964	-2076664	-2099404	-2122341
Poles	-45757	-29236	-27672	-40508	-55214	-59261	-65738
Sawnwood	-20816	-70109	-67251	147550	156651	-60971	-25335
Veneer	7571	5665	6709	6278	5847	5416	4965
Total without fuelwood	-53002	-83627	-88214	113320	107264	-114815	-87068

Source: Forest Resources Study, Akwa Ibom State

Table 3. Timber demand for Akwa Ibom State (M m^3/yr)

Product	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Fuelwood	2,264,477	2,287,300	2,310,123	2,332,946	2,355,769	2,378,592	2,401,415	2,424,238	2,447,061	2,469,884	2,492,707	2,515,530
Poles	57,968	59,780	61,592	63,404	65,216	67,028	68,840	70,652	72,464	74,276	76,088	77,900
Swanwood	81,511	87,340	93,169	98,998	109,827	110,656	116,485	122,314	128,143	133,972	139,801	145,630
Veneer	5,509	5,940	6,371	6,802	7,233	7,664	8,095	8,526	8,857	9,388	9,819	10,250
Total without fuelwood	144,988	153,060	161,132	169,204	177,276	185,348	193,420	201,492	209,564	217,636	225,708	233,780
Total with fuelwood	2,409,465	2,440,360	2,471,255	2,502,150	2,563,045	2,563,940	2,599,835	2,625,730	2,656,625	2,687,520	2,718,415	2,749,310

Source: FORMECU, (1999) Forest Resources Study Nigeria

4.1.2 Overexploitation of forest resources

The need to meet the increasing population demand for wood products has resulted in overexploitation of forest resources. For example, parts of the Stubbs Creek forest reserve has been heavily logged and degraded through lease for temporary residency, farming and hunting. There is high impacts of logging for timber in the reserve by commercial loggers and poachers; these have led to overexploitation of the reserve. Presently, most of the forests in the state are characterized by logged over, naturally but poorly regenerating forests with scattered farmlands so that the potential of the forests to sustainably meet future demands for timber has been greatly impaired.

Overexploitation of forest resources due to high demand and population increase have resulted to extinction of some valuable species of timber. This loss of species implies loss of values in term of social, cultural and economic or scientific values. Our natural forests are seriously threatened and porous, such that some of the valuable timber species are not found in abundance. Accordingly, [27] reported that, because of increase in population and the growing demand for land by farmers, the three gazetted forest reserves in Akwa Ibom State with a land area of 318.57 km^2 have been degraded and as such do not show a true representation of a tropical rainforest. In terms of structure, physiognomy, composition and species abundance, the forest reserve has lost their value due to over-exploitation in the reserve. This is attributed to the massive deforestation and degradation of land resources experienced in the State [27].

4.1.3 Revenue targets given by government

Every year, the Akwa Ibom State government gives revenue targets to the forestry directorate. This annual revenue targets, together with illegal and indiscriminate exploitation of forest resources by members of the public has resulted in destruction and removal of forest resources from the forest. The interest of government on revenue from the forest resources has caused the forest officers to over-exploit the forest, which results to depletion and decimation of biodiversity in all forest ecosystems. Forest resources are exploited to earn revenue and it leads to total destruction of ecosystem. To further complicate the problem, revenue earned by the government are not invested in the forestry sector. This issue of revenue targets given to the forestry directorate by the state government has affected timber production by causing deficit of timber production.

4.1.4 Increase in population and infrastructural expansion

The population of the state has been growing more rapidly than what it was before population growth and high human densities exact a heavy toll on small forest products base. Akwa Ibom State population increase of 2.409 million in 1991, 3.902 million in 2006, 4.785 million in 2012, 5.482 million in 2016 and 5.671 million in 2017 at a growth rate of 3.46% per year [24]. Population increase, in combination with factors like pollution a consequence of improper waste disposal system, urbanization and mining oil exploration, have resulted in decimation of forest resources. With current infrastructural expansion and urbanization, there is an increasing trend in the demand of wood for building, construction, charcoal and fuel wood production. This has led to an increasing exploitation of wood and the rate at which the forest is being-exploited. According to [27], wood demand and supply in the Akwa Ibom State reveals a both pathetic and worrisome situation for a state whose cities and infrastructures are fast expanding with high demand for wood products. Akwa Ibom State has experienced wood deficit of about 2.5 million cubic meters, which increased to 2.7 million cubic meters by 2010 [27].

4.1.5 Non-participation of the private sector in forest development and management

In Akwa Ibom State, forestry development and management are primarily in the hands of government. People believed that it is a service of government to its citizenry. The private sector and the general public have not been engaged in forest resources regeneration and management. The population is only involved in the harvesting, processing and marketing of forest produce and the products, leaving regeneration and management in the hands of government. According to [7], private forestry is virtually non-existence in the state except in the processing of forest produce as the state government through its forestry service manages the forest resources in the state in trust for the people using a public forestry workforce.

4.2 Strategies for Increasing Timber Production in Akwa Ibom State

The present deficit situation of timber production in the state will continue if nothing will be done about it. To improve the situation, there should be sustained and committed efforts of both the government and the private sector. Such efforts should be geared toward the following areas:

4.2.1 Conservation and preservation of natural forests

Conservation of natural forests is the wise use and exploitation of the products from the forests without causing harm to the resource base or impairing the renewability of the forests. The remaining areas of the natural forests should be managed in a sustainable manner particularly the forest reserves in the state in order to enjoy their benefits in perpetuity. The tropical rainforest is the most biologically diverse ecosystem on the earth and ecological robust in providing forests resources. Conservation of the remaining forests in the state is an important strategy in dealing with deficit of timber production.

Conservation is concerned with the protection, preservation and wise use of resources. It means the management of a particular resource for maximum continuing product consistent with the maintenance of a constantly renewable stock [29]. To improve timber production in the state, forest must be conserved by promoting their protection from loss, waste and damage through sustained yield management and care [30].

4.2.2 Reforestation and afforestation programmes

Afforestation is the establishment of a forest or stand of trees in an area where there are no forest. Afforestation is a positive effort in curbing the over-use and destruction of natural forests. If done with proper planning and at appropriate sites, it can become a commercially viable solution for many human needs without harming the balance of nature. The regeneration of forests by artificial planting of fast-growing tree species, on the degraded and destroyed forestlands is necessary in a fast-growing economy like Akwa Ibom in order to ameliorate the effect on timber deficit in the state. The vast areas of land that have been deforested should be afforested by planting fast-growing species. The objective of intensive reforestation and afforestation activities should be geared toward timber and wood production. Both government and private sector should be involved in intensive afforestation of the state to improve timber production in the state. Forest estates, reserves, and other forest areas should be given out to most of the private foresters to establish forest plantations, while government provides attractive and encouraging incentives and subsidies.

4.2.3 Private sector participation in forest regeneration

Private forestry can be defined as the establishment or development of forest plantations by individuals, companies, families, communities, schools and other organizational agencies. Government agencies should partner with private sector by providing them incentive packages such as soft loans, seedlings and technical advice to ensure the success of such ventures. In addition, problems of gestation period of forestry investments and land tenure system, which makes it difficult for private sector to invest in forestry development, should be attractively resolved in favour of the participants. This will go a long way in encouraging private individuals to venture into establishment and development of forest plantations.

4.2.4 Adoption and promotion of agroforestry systems

Agroforestry system is a sustainable land management practices that can provide multiple benefits. It is a system where trees and crops and/or animals are integrated on the same land at the same time. It is the cultivation of forest crop, arable crop and/or production of livestock on the same piece of land simultaneously on sustainable basis. Farmers allow some forest tree and shrub species, which produce products of economic and social values to remain on their farms. In addition to the economic and social values, the standing trees on the farms provide fuel wood, poles and timber. Agroforestry practices such as home garden, taugya system, woodlots, shelterbelts, farm boundaries and live fences apart from providing food, medicinal plants, fruits, nuts and other products, can also provide timber which can be processed into wood for building, for construction and for electrical poles.

4.2.5 Sustainable management of natural resources

Natural resource users believed that these resources would continue to be no matter the

volume or amount remove. Based on this ideology, natural resources have been overexploited. The inability of these resources to recover from overexploitation has resulted in scarcity of many resources. More so, there has been no spelt out management pattern for sustainability of forest products.

Sustainable management involves devising methods and techniques of harvesting and exploiting of renewable resources to ensure their availability for perpetuity. [31] defined sustainable resource management as all the strategies and methods that are employed to ensure that the removal of a particular resource for today's use does not affect its availability for the people of tomorrow.

5. CONCLUSION

Importance of forest to humankind cannot be over-emphasized. It provides tangible and intangible benefits to man. The state of forest in the study area reveals that it has been disturbed and degraded by human activities. Furthermore, Akwa Ibom State has forest ecosystems that have the capacity of providing forest resources base from which timber products could be derived to meet the high demand of the increasing population. But certain factors such as deforestation, overexploitation of forest resources, non-participation of the private sector in forest development, inadequate funding of forestry production, as proffered in the practical strategies recommended above, could be improved through reforestation and afforestation programmes, conservation of natural forests, education and awareness, private sector participation in forestry regeneration and adoption of agroforestry systems.

ACKNOWLEDGEMENTS

The authors appreciate the God almighty for his guidance and inspiration through the process of this manuscript. The effort of the Head of Department Forestry and Wildlife, Nnamdi Azikiwe University Awka to provide funds and ensure the manuscript for this paper was prepared and accepted is highly appreciated.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Ogar DA. Fundamentals of forestry and wildlife management in Nigeria. Unical Printing Press University of Calabar. 2010;122.
2. Society of American Foresters. The Dictionary of Forestry. Society of American Foresters; 2008.
   Available at dictionary safnet.org
   (Accessed September 15, 2013)
3. Maazou S. Forests: Conserving the green gold. Spare No. 2011;153:13-17.
4. Turner IM. The ecology of trees in tropical rainforest. Cambridge University Press, Cambride. 2001;298.
5. Gillespier TW, Brock J, Wright CW. Prospects of quanitfying structure, foristic composition and species richness of tropical forests. International Journal of Remote Sensing. 2004;25(14):70-77.
6. Eniang EA, Udo ES. The challenge of horticulture and forestry practice in Nigeria: An underdeveloped renewable resource base of a growing nation. In: Okon, E., Brown, D. and Isichei, A. (Eds) Nigerian Forests: Protection and Sustainable Development. Proceedings of JABU Environment Symposium held on 2 June 2011 at Joseph Ayo babalola University (JABU). Ikeji-Arakeji, Osun State, Nigeria. 2013;280-295.
7. Udo ES. The position of forestry in Akwa Ibom State. In: Udo, E. S. (Ed.) Forestry and Sustainable Environment 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 Area, 10th – 11th April. 2001;31-43.
8. Chao S. Forest people: Numbers across the world. Forest peoples programme, United Kingdom. Eniang, E. A. and Udo, E.S. The challenge of horticulture and forestry practice in Nigeria: An Underdeveloped Renewable Resource Base of a Growing Nation. In: Okon, E., Brown, D. and Isichei, A. (Eds) Nigerian Forests: Protection and Sustainable Development. Proceedings of JABU Environment Symposium held on 2 June 2011 at Joseph Ayo Babalola University (JABU). Ikeji-Arakeji, Osun State, Nigeria. 2012;280-295.

9. Udo ES. Our forests: Uses, management and abuses. The 51st Inaugural Lecture Delivered in the University of Uyo. Thursday, November 24, 2016. Dorand Publishers. 2016;95.
10. Food and Agriculture Organization (FAO). State of the World's Forest. 2005;153.
11. Ogunwusi AA. Challenge of industrial production and processing of rattans in Nigeria. JORINS. 2012;10(2):50-59.
12. Asinwa IO, Adio A, Williams OA, Okesiji IT, Ezekiel JM. Forestry development as agent of food security and wealth creation. In: Popoola, L., Ogunsanwo, K. and Idumah, F. (Eds) Forestry in the Context of the Millennium Development Goals. Proceedings of the 34th Annual Conference of the Forestry Association of Nigeria held in Osogbo, Osun State, 05-10 December 2011. Forestry Association of Nigeria. 2011;1:43-56.
13. UNEP. Forests in a green economy: A synthesis. United Nations Environmental Programme (UNEP); 2011.
Available:www.unep.org
(Accessed August 8, 2013)
14. FAO. State of the World Forest 2009, Food and Agriculture Organization of the United Nations, Rome, Italy. 2009;75.
15. Oluwabenga OI, Orimoogunje JA. Fuel wood consumption and species degradation in South-Western Nigeria: The ecological relevance. Journal of Landscape Ecology. 2015;8(1):56-68.
DOI: 10.15/5/jicl-2015-0004
(Accessed May 9, 2018)
16. Ikurekong EE, Esin JO, Mba AC. Rural fuelwood exploitation in Mbo Local Government Area – A Nigeria coastal settlement; 2009.
Available:https://www.reseachgate.net>3
(Accessed May 7, 2018)
17. Ali-Amin M. Domestic energy crisis and deforestation challenges in Nigeria. Journal of Environment and Earth Science. 2014;4(2):94-100. ISSN 2224-3216 (paper) ISSN 2225-0948.
Available:www-ii-ste.org>JEES>article>download
(Accessed May 7, 2018)
18. Adeyemi AI, Jegede G. Effects of anthropogenic actives on Nigerian environment. In: Abu, J.E., Oni, P.L. and Popoola, L. (Eds.). Proceedings of FAN held in Akure, Ondo State, Nigeria between 4th and 8th of November. 2002;89-93.
19. Adebisi LA, Abu JE, Adedodun MO. A review of traditional forest uses. In: Popoola, (Eds). 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;42-50.
20. Okonkwo MC, Umar G, Nwafor OE. Forest resources depletion and the national economy. In: Abu, J.E., Oni, P.L. and Popoola, L. (Eds.). Proceedings of FAN held in Akure, Ondo State, Nigeria between 4th and 8th of November. 2002;94-100.
21. Oluyege AO. Wood, a versatile material for national development. The 45th Inaugural Lecture Series Delivered at the Federal University of Technology Akure, Ondo State. Nigeria. 2007;61.
22. Nwokeabia OD. Demand and supply of forest products in Nigeria. Paper Presented at a Seminar on Forest Industries Data Collection Techniques, 13th-19th May, 1983 held in Benin City, Edo State. 1983;10.
23. Adegbulugbe AO. Energy demand and CO_2 emissions reduction options in Nigeria. Journal of Science and Energy Policy. 1991;19(10):940-945.
Available:https://doi.org/10.1016/0301-4215 (9)90113-3
24. NPC. National Population Census Result: Legal notice on the detail of breakdown of the National and State Provisional Totals. National Population Commission. Printed and Published by the Federal Government Printer, Lagos. Nigeria. FGP71/52007/2500 (OL24); 2007.
25. Forestry Directorate. 1st Quarter Report. Directorate of Forestry and Environmental Conservation, Ministry of Environment and Mineral Resources, Forestry Headquarters, Uyo; 2018.
26. FORMECU. Forest Resources Study Nigeria, Akwa Ibom State. Revised Management Plan, Prepared for FORMECU, Federal Department of Forestry Nigeria by Beak, Geometics International and Geomatics Nigeria. 1999;116.
27. Akpan-Ebe IN. Reforesting the depleted forest estates of Akwa Ibom State, Nigeria. Nigerian Journal of Agriculture, Food and Environment. 2015;2(1):165-172.
28. Akpan-Ebe IN, Amankop KS. The dearth of timber and non-timber forest products in Akwa Ibom State, In: Udo, E. S. (Editor).

Forestry and Sustainable Environment. Proceedings of the 1st Workshop of the Forestry Association of Nigeria, Akwa Ibom State Branch. 2001;44-55.

29. Okebukola, Akpan B. Strategies for environmental education: Focus on desertification and biodiversity conservation. Science Teachers Association, Nigeria Environmental Education. 1999;3:36-111.
30. Magome H. Biodervisity conservation development and local people: Politics puzzles and potential. Keynote Address at Conference towards Best Practice: Communities and Conservation, 15th – 16th May. Bery and Dal, Kruger, National Park, South Africa. 2000;14-18.
31. Unanaonwi OE. Sustainable utilization of forest resources: A step to sustainable agriculture (Neils, J.S., Khobe, D., Ja'afar-furo, M.R., Futuless, K.N.- Eds). Proceedings of the 24th National Conference of Farm Management Association of Nigeria, Held at Adamawa State University Mubi, Nigeria. 11th – 14th October. 2010;264-266.

Peer-review history:
The peer review history for this paper can be accessed here:
http://www.sdiarticle4.com/review-history/58263