

Threats and conservation status of woody plant species in different ecological zones of Taraba State, Nigeria

Abstract

Woody plant species are important resource to human livelihoods. However, these Species are declining steadily everywhere in the world and some have been threatened with extinction. Tropical forests are the richest biological communities on earth and these forests have been recognized to harbors significant proportion of global biodiversity. The highest rates of woody plant species loss are in the tropics. Following decades of rapid land cover Conversions the tropical forest vegetation is much fragmented with considerable loss of woody plant species cover.¹⁻⁴ Woody plant species cover in Nigeria gives an array of products and services that play important roles in the country's economy and general wellbeing. The major causes of woody plant species loss are linked to rapid human population growth Rates and poverty. Many Nigerians because of poverty and high level of illiteracy Have seen woody plant species vegetation as an infinite natural resource thus I have been misused and abused. These drivers force people to harvest woody plant species using poor methods and at unsustainably high intensities. High intensity of logging and illegal exploitation of woody plant species and other resources has continued to pose serious threat to the country's biodiversity.⁵⁻⁷ Taraba State is one of the few States in Nigeria that possess a unique characteristic of woody plant species vegetation. This vegetation has received Poor conservation attention; as a result woody plant species is being whittled away. Woody plant species play important role in the survival of manonearth there by providing array of wood and non-wood products which are significant in sustaining the overall socio-economic well being of human. The protection functions and Potential worth for these species have been overlooked and ignored; Today, these Species are going extinct an accelerated and dangerous rate because of non natural environmental changes caused by human and natural activities as well as Poor conservation status leading to habitat loss, degradation, spread of non-native Plant species, pollution and climate change.⁶⁻⁸ This calls for need to determine the Threats and conservation status of woody plant species

Volume 8 Issue 6 - 2018

Meer Bernard Bunde

Department of Forestry and Wildlife Management, Modibbo Adama University of Technology, Nigeria

Correspondence: Meer Bernard Bunde, Department of Forestry and Wildlife Management, Modibbo Adama University of Technology, Yola, Nigeria, Tel +2347039060249, Email meersbarnardo@gmail.com

Received: October 30, 2018 | **Published:** November 26, 2018

Materials and method

Study area

Taraba State lies between latitudes 6034'36"N and 9058'51"N and longitudes 90 52'28"E and 120 39'51"E. It occupies a total land mass of approximately 54,473km² (Figure 1). The State is bordered on the northwest by Gombe State, west by Plateau and Nassarawa

States and by Adamawa State in the northeast. It also Shares its southwest boundary with Benue State. An international boundary on the East separates Taraba State from the republic of Cameroon. The state is made up Of three major ecological zones which include Southern guinea savanna located In the south western part of the State, Northern guinea savanna in the northeast And Montane Forest in the south east.^{9,10}

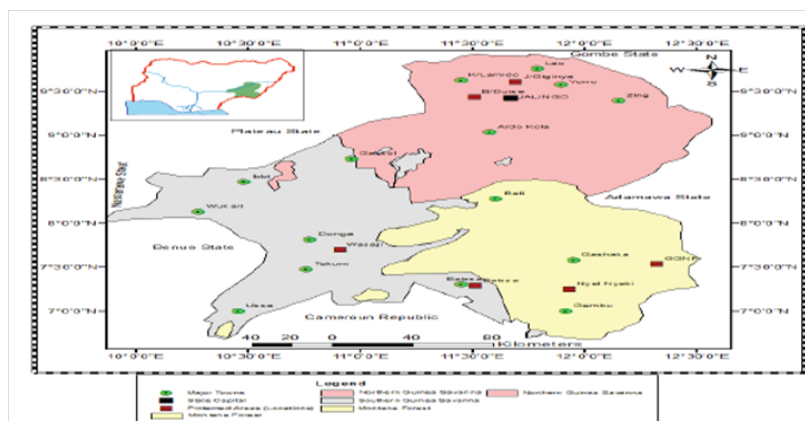


Figure 1 Map of Taraba state showing the major ecological Zones and the study area.

Source GIS Mautech Yola, 2017.

Data collection and analysis

The study site was stratified in to three ecological zones namely;

Northern Guinea Savanna (NGS), Southern Guinea Savanna (SGS) and Montane Forest(MF) A Simple random sampling method was used to select respondents from the study Population that live in and around

the protected areas of the study area, who also depend on woody plant species for their livelihoods 50 respondents were Randomly selected from each zone and a total of 150 respondents were thus Sampled but only 146 questionnaire were retrieved during the sampling. Data were Analyzed using statistical tools such as Tables, percentages and frequency.

Results

Demographic characteristics of forest dependent communities the result of the demographic characteristics of respondents in Table 1 indicated that 63.70% of the respondents were male while 36.30% were female. Majority (53.42%) of the respondents were youths between the age group of 10-30 years. Followed by the age group of 31-50 years (27.40%). The educational level of the Respondents revealed that majority (46.58%) had secondary school education, 30.82% had primary school education, 5.48% had tertiary education while 17.12% had no formal education. Result of marital status showed that 67.12% of the People who lived in the study area were married while 32.88% of the people were single. This result further indicated that 56.85% of the respondents were farmers who identified themselves in the course of the interview as nomadic herders and crop cultivators, 3.43% were civil servants, 18.49 % and 21.23 % were artisans and herbalists respectively who depended solely on woody plant species extraction to earn their living.

Table 1 Demographic characteristics of forest dependent communities

Variable	Frequency	Percentage (%)
Gender		
Male	93	63.7
Female	53	36.3
Total	146	100
Age Group		
10-30 years	78	53.42
31-50 years	40	27.4
51 years and above	28	19.17
Total	146	100
Education		
Primary	45	30.82
Secondary	68	46.58
Tertiary	8	5.48
Non formal education	25	17.12
Total	146	100
Marital status		
Married	98	67.12
Single	48	32.88
Total	146	100
Occupation		
Farming	83	56.85
Civil servant	5	3.43
Artisan	27	18.49
Herbalist	31	21.23
Total	146	100

Conservation status of woody plant species

The conservation status of woody plant species (Table 2) in the study area as Revealed by respondents who live in and around the sampled protected areas Showed that 25.34% of them conserve woody plant species for food and protection, 6.85% agreed that they conserve woody plant species for medicinal values, other Respondents (3.43%) said they conserve these plants because of cultural and Religious values. Majority (64.38%) of the respondents revealed not to participate in any form of the conservations strategies. The study also revealed that 46.58% of the respondents admitted cutting down woody plant species to expand their Agricultural production. 23.97% and 8.90% of the respondents embarked on Deforestation practices for fuel wood collection and settlement respectively, wood Products also provide income for their livelihood. 20.55% of the respondents do not Supported forestation in the study area. It was however revealed that there was a Great decrease (20.55% very high, 60.27% high and 15.07% low) in the availability of woody plant species in the study area. This has given rise to a high level of deforestation that showed clear evidence of desertion coachmen (12.33%), weather/ rainfall changes (15.07%), soil erosion and degradation (15.07%), drought and many others (57.53%) such as global warming, flood, water scarcity, etc as observed by the respondents.

Table 2 Distribution of respondents based on the conservation status of woody Plants

Variable	Frequency	Percentage (%)
Reason(s) for Conservation		
Food/Protection	37	25.34
Medicinal values	10	6.85
Cultural/Religious values	5	3.43
None of the above	94	64.38
Total	146	100
Deforestation activities		
Farming	68	46.58
Fuel Wood/Sale	35	23.97
Building	13	8.9
None of the above	30	20.55
Total	146	100
Assessment of deforestation		
Very high	30	20.55
High	88	60.27
Low	22	15.07
None of the above	6	4.11
Total	146	100
Environmental changes observed in the area		
Desert encroachment	18	12.33
Weather/Rainfall patterns	22	15.07
Soil erosion/degradation	22	15.07
Drought and Others	84	57.53
Total	146	100

The current conservation status of woody plant species in the study area

Respondents were asked to list species they thought were declining in availability and those they thought were increasing. For some species, there were respondents who thought that the species was declining in number, while other respondents thought otherwise. For every species, the frequencies for increase in availability were compared with those for decrease in availability and the greater of the two frequencies taken as the status for the species. From this analysis (Table 3) nineteen (19) species are decreasing in availability while eight (8) are increasing in availability as listed by the respondents. The conservation status of the 27 species enlisted by the respondents was also checked and confirmed on the IUCN red list of threatened species Version 2016- 2.3. Out of the 27 species, two species (*Rauvolfia* and *Sterculia* species) were reported to be threatened with extinction, *Khaya senegalensis* was reported vulnerable while 5 species (*Acacia* species, *Albizia* species, *Allophylus africanus*, *Strychnos spinosa*, *Vetellaria paradoxa* and *Vitex donianna*) were in danger. Some species were reported least concern, while *Anogeissus leiocarpa*, *Strombosia postulate*, *Rytignia umbellatum*, *Uapacato goensis* and *Pterocarpus erinaceus* were not found on the IUCN catalogue. Threats and factors associated with woody plant species conservation Results of the threats on woody plant species conservation in the study area as Indicated in Table 4 showed that human activities (67.12%) was the major factor Affecting woody plant species diversity and structure in the study area, followed by Animal activities (13.01%), natural disasters (12.33%) and poor soil quality (7.53%). Furthermore, the species known to be increasing

in abundance are successful Because of the support from Government and Non-Governmental Organizations (17.12%). Similarly, the increase is also associated with natural regeneration (47.95%), human inducement (25.34%) and law enforcement (9.59%) among other Factors (Table 4). The results from Table 4 also revealed that majority (76.71%) of The respondents were not given any grant or support to conserve forest resources Including woody plant species. Only 10.27% of the respondents received grants and supports from federal government. However, 13.01% of them were supported by different Non-Governmental Organizations. Results on the perception of woody plant species conservation indicated that 19.86%, 13.70% and 17.12% of the respondents considered woody plant species Conservation as very important, important and fairly important respectively while 49.32% said woody plant species conservation is not important. Result of the Willingness of the respondents to participate in woody plant species conservation Showed that 17.12% and 10.96% of the respondents did not support woody plant Species conservation while 28.77% and 43.15% of the respondents did support Woody plant species conservation (Table 4). On the effects of woody plant species conservation, 62.33% of the respondents opined that woody plant species conservation affected their activities such farming, grazing, and settlement as well as non-timber forest products harvested very high rate. 17.12% indicated high rate where as 12.22% indicated low rate while 8.22% of the respondents said woody plant species conservation affected their Activities very low. The general acceptability of wood protection revealed that 28.08% and 54.80 % of the respondents welcome the idea of woody plant species Protection, while 10.27 % and 6.85% of the respondents did not like the idea.

Table 3 Important woody plant species and their conservation status

Species	Frequencies		Species status
	Decreasing in availability	Increasing in availability	
<i>Acaciasp</i>	77	58	Decreasing
<i>Azelia africana</i>	108	4	Decreasing
<i>Albizia gummifera</i>	105	21	Decreasing
<i>Allophylus africana</i>	54	7	Decreasing
<i>Anogeissus leiocarpa</i>	12	93	Increasing
<i>Bambax cos veolens</i>	79	1	Decreasing
<i>Borassus aethiapum</i>	88	17	Decreasing
<i>Deinbolia pinnata</i>	22	69	Increasing
<i>Garcinia smithmanii</i>	0	59	Increasing
<i>Hymeno cardiaacida</i>	5	116	Increasing
<i>Khaya senegalensis</i>	59	34	Decreasing
<i>Pleiocarpa pycnantha</i>	2	77	Increasing
<i>Prosopis africana</i>	11	122	Decreasing
<i>Psychotria sp</i>	19	1	Decreasing
<i>Pterocarpus erinaceus</i>	80	0	Decreasing
<i>Rauvolfia vomiteria</i>	57	0	Decreasing
<i>Rytignia umbellatum</i>	15	78	Decreasing
<i>Schefflera abyssinica</i>	36	3	Increasing
<i>Sterculia setijera</i>	91	27	Decreasing
<i>Strombosia postulate</i>	0	72	Decreasing
<i>Strychnos spinosa</i>	56	3	Increasing
<i>Terminalia species</i>	73	67	Decreasing
<i>Uapacato goensis</i>	0	131	Increasing
<i>Vetellaria paradoxa</i>	86	42	Decreasing
<i>Vitex donianna</i>	65	29	Decreasing
<i>Ziziphus sp</i>	104	0	Decreasing

Table 4 Threats and factors affecting woody plant species conservation in the Study area

Variable	Frequency	Percentage (%)
Factors affecting growth and distribution of trees		
Human activities	98	67.12
Wildlife/Domestic Animals	19	13.01
Natural disasters	18	12.33
Poor soil quality	11	7.53
Total	146	100
Factors promoting growth and distribution of trees		
Promotion by Govt/NGOs	25	17.12
Natural factors	79	47.95
Human inducement	37	25.34
Law enforcement	14	9.59
Total	146	100
Conservation grant/support		
Federal Government	15	10.27
State/Local Government	0	0
Non-Governmental Organizations	19	13.01
None of the above	112	76.71
Total	146	100
Perception of forest conservation		
Very Important	29	19.86
Important	20	13.7
Fairly Important	25	17.12
Not Important	72	49.32
Total	146	100
Forest conservation participation		
Very High	42	28.77
High	63	43.15
Low	25	17.12
Very Low	16	10.96
Total	146	100
Effects of woody plant species conservation		
Very High	91	62.33
High	25	17.12
Low	18	12.22
Very Low	12	8.22
Total	146	100
Conservation acceptability		
Very High	41	28.08
High	80	54.8
Low	15	10.27
Very Low	10	6.85
Total	146	100

Discussion

Youths are the productive segment of the population, their dominance implies that they will be highly involved in conservation if biodiversity conservation strategies are introduced and they will be active, hale and hearty in conserving the biodiversity in the area. The majority of the people in the study area were literate; they can read and understand any new development in environmental conservation practices to be able to convince others on the importance of woody plant species Protection. The marriage status of the respondents is an indicative of a possible fast population growth which therefore means more pressure on woody plant species. This observation agrees with the authors below that rapid human population growth rate is the major cause of woody plant species loss. These population growth pose a serious challenge on woody plant species due to indiscriminate exploitation by artisans and herbalists coupled with the high rate of Agricultural activities simply that soiled gradation in the area is inevitable. Human activities are the major causes of soil degradation which in turn reduce the population of woody plant species.¹¹⁻¹³

Few respondents in the study area conserve woody plant species for various reasons. This is due to the fact that woody plant species provide economic services (e.g. food, medicines, shelter, fodder, non-wood forest products, wild life tourism and products of cultural and religious importance) and ecological services (e.g. erosion protection, micro climate same location, organism habitat, carbon sequestration, etc.) that sustain local livelihoods. This confirmed that woody plant species are considered essential to economic development and the maintenance of all forms of life. The conservation of woody plant species has become a huge Challenge in our time in the background of farming, fuel wood extraction, building and industrial activities due to increasing human population with high deforestation rates. The intensive logging practice has seriously damaged the composition and structure of woody plant species of the study area there by increasing the economic, social and environmental problems such as desert encroachment, soil erosion, flood, drought, poverty, poor soil quality, and health challenges. This means that the decline in tree cover affect aspects of daily life of the people.¹⁴⁻¹⁷ Some of the priority species (including *Rauvolfia vomitoria* and *Sterculia setigera*) are known to be disappearing and the rate of regeneration is significantly lower than the rate of extinction. Human activities such as those in the past and those in recent years are known by respondents to cause decline in species availability and significant in stability in the ecosystems of the study area. This confirms with a 10 Report that the loss of woody plant species diversity results from many direct causes, some of which are natural but aggravated by anthropogenic factors. It also Agreed with other reports that the degradation of forests and habitat loss due to anthropogenic activities are among the major causes of decline in biodiversity. Human induced disturbances determine the vegetation structure and composition of forests by their influences on their generation success of woody plant species. Excessive anthropogenic disturbances, such as logging or cutting trees, usually result in an immediate decline in species diversity.¹⁸⁻²⁰ On the other hand, species known to be increasing in abundance are successful because they are planted and most of them are drought resistant. The success is also recorded as a result of natural regeneration, easy management, and laws that restrict exploitation. Factors responsible for the success of woody plant species in an area include conducive environment for seed germination and seedling development within the accompanying organic manure from the litter that fall off from woody plant species which may be connected to the differences in the moisture availability enhanced by woody plants.²¹⁻²⁴ More efforts were needed to encourage

the forest dependent communities through the provision of grants, basic amenities and alternative sources of income in the study area because some of their respondents considered woody plant species as a threat to their existence since it aimed at minimizing the exploitation of forest resources which is their basic source of livelihood. It was found in the course of the interview that majority of the respondents are ready to embrace woody plant species conservation strategies despite its challenges. This calls for the development of sustainable management systems which guarantee the long term use of woody plant species resources.

Conclusion

The declining woody plant species due to poor conservation and high demand of woody plant species resources in the face of increasing changes in the biophysical environment have reduce the population of woody plant species to a none sustainable level in Taraba State. The knowledge of woody plant species Conservation is highly necessary to the understanding of woody plant species and other resources relationship for effective conservation. These have led to calls for urgent conservation attention as most of the species in the study area were found to be under pressure.

Acknowledgments

None.

Conflicts of interest

Author declares that there is no conflicts of interest.

References

1. Naidu MT, Kumar OA. Tree diversity, stand structure, and community composition of tropical forests in Eastern Ghats of Andhra Pradesh, India. *Journal of Asia-Pacific Biodiversity*. 2016;9(3):328–334.
2. State of the World Forests. Rome: Food and Agriculture Organization of the United Nations; 2018.
3. Pabi O, Attua EM. Spatio-temporal differentiation of land-use/cover changes and natural resources management. *Bulletin of the Ghana Geographical Association*. 2005;24:90–102.
4. Amanor KS, Pabi O. Space, Time, Rhetoric and Agricultural Change in the Transition Zone of Ghana. *Human Ecology*. 2007;35:51–67.
5. Aboye MAN. Environmental Management and Education. Lagos, Golden pen. Books. 2001;45-71.
6. Tabuti JRS. Important Woody Plant Species, their Management and Conservation Status in Balawoli Sub-county, Uganda. *Journal of Plants, People and Applied Research*. 2012;10:269–286.
7. Okafor E, Chinenye L, Ibeawuchi II, et al. Biodiversity Conservation for Sustainable Agriculture in Tropical Rain forest of Nigeria. *Newyork Science Journal*. 2010;3(1):81–88.
8. Stain BA, Lynn S, Jonathan SA. The status of biodiversity in the United States. Oxford University Press; 2000. p. 3–9.
9. GIS Laboratory Geography Department MAUTECH. Yola; 2017.
10. Jalingo: Taraba State Investment and Property Limited; 2016. p. 7–15.
11. McCarty JP. Ecological consequences of recent climate change. *Conservation biology*. 2001;15(2):320–331.
12. Al-Amin AM. Place biodiversity in ecosystems efficiency in Nigeria. *British Journal of Earth Sciences Research*. 2013;1(1):10–17.
13. Akinyemi OD, Idumah FO, Alabi OY, et al. Climate change and Bio diversity in Nigeria. In: Popoola I, editor. Climate Change and Sustainable Renewable Natural Resources management proceedings of the 32nd Annual conference held in Umuahia, Abiastate, Nigeria. 2008. p. 243–254.
14. National Environment Management Authority (NEMA). State of Environment Report For Uganda 2010. In: Obiri JF, editor. Invasive plant species and their disaster effects in dry tropical forests and range lands of Kenya and Tanzania. *JAMBA: Journal of Disaster Risk Studies*. 2011;3(2).
15. VallenjoVR, Valdecentos A, Mayor AG, et al. Over grazing in cyprus: Adaptations and degradation process European commission FP7 Program. 2011.
16. United States Agency for International Development (USAID). Uganda Biodiversity and tropical forest assessment report. International Resources Group 1211 Connecticut Avenue, NW, Suite700 Washington, DC20036. 2006.
17. Porter M. The value of woody plants. Agricultural information research and faculty outreach and education philanthropy news and media employment. 2007. p. 37–61.
18. International Union for Conservation of Nature (IUCN). Red List of Threatened species. Version 2016-2.3 (www.iucnredlist.org).
19. Secretariat of the Convention on Biological Diversity (SCBD). Global Biodiversity Outlook Montreal. SCBD United Nations Environmental Programmes (UNEP). 2001. 282 p.
20. Neelo J, Teketay D, Kashe K, et al. Stand Structure, Diversity and Regeneration Status of Woody plant species in Open and Exclosed Dry Wood land Sites around Molapo Farming Areas of the Okavango Delta, Northeastern Botswana. *Open Journal of Forestry*. 2015;5(4):313–328.
21. Cotler Hand Ortega-Larrocea MP. Effects of Land Use on Soil Erosion in a Tropical Dry Forest Ecosystem. Chamela Watershed, Mexico. *Catena*. 2006;65(2):107–117.
22. Mekonen T, Ayele B, AshagrieY. Woody plant species Diversity, Structure and Regeneration Status of Woynwuha Natural Forest, North West Ethiopia. *Asian Journal of Ethnopharmacology and Medicinal Foods*. 2015;1(2):3–15.
23. Kalema VN. Diversity, use and resilience of woody plants in a multiple land-us. Equatorial African Savanna, Uganda. Johannesburg, South Africa: PhD. Thesis, University of the Witwatersrand; 2010. p. 5–15.
24. Neelo J, Teketay D, Masamba W, et al. Diversity, Population Structure and Regeneration Status of Woody plant species in Dry Wood lands Adjacent to Molapo Farms in Northern Botswana. *Open Journal of Forestry*. 2013;3(4):138–151.