Causes of Hardwood Scarcity in Benue State, Nigeria: A Study of Forestry Management Practices for Improving its Production

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Paper Information	A B S T R A C T
	Hardwood scarcity has been a serious concern to woodworkers and wood merchants in Benue state, Nigeria despite the fact that the area is in the tropical region. Therefore, the study was conducted to identify forestry management practices that would improve hardwood production in Benue state, Nigeria. Four research questions and two hypotheses were formulated to guide the study. A survey research design was adopted for the study and systematic random sampling technique was used to select 13 Local government areas out of 23 for the study. The population for the study comprised of Forest field workers, Forest Heads of Departments at the state Ministry of Agriculture in each Local Government Area and Heads of Forestry Section in the Local Government Council i.e staff of Ministry for Local government and Chieftaincy Affairs. The total population for the study was one hundred and forty eight (148) and all the respondents were used since the population wasn't much. A structured questionnaire was used for data collection. The instrument was subjected to both content and face validation by three experts i.e one from Department of Forestry, University of Agriculture, Makurdi, Benue state, Nigeria while the other two from Wood Technology section , Federal University of Technology, Minna, Nigeria. Cronbach Apha Formula was used for checking the internal consistency of the instrument and the reliability coefficient of the instrument was found to be 0.89. Mean and standard deviation were used for the analysis of data while Z- test statistics was applied for testing hypotheses at 0.05 level of significance. The findings of the study revealed illegal felling of hardwood in the forest; there were many low grade species of wood in the forest and also there were many stunted growth of hardwood species due to lack of forest maintenance . It was recommended that more afforestation with particular reference to hardwood should be established by non governmental organizations, federal and state government, more forest staff should be employed for maintaining the forest in terms of forest protection against pests, removing stunted growth and controlling of weeds in the forest; low grade species of wood in the forest should be removed and replaced with hardwood species. Finally, illegal felling of forest trees should be controlled by using villagers living close to the forest to monitor illegal loggers and circuit television should be used where possible.

Key words: *Forest, Hardwood, Management, Practice, Production*

Introduction

Hardwoods are woods obtained from dicotyledon. Dicotyledon is a deciduous tree whose broad leaves shed annually and the seeds are usually enclosed in cases. Timbers from dicotyledon are called pored wood or hardwood. These hardwoods are Afara, Agbu, Iroko, Mahogamy, Mansonia, Opepe e.t.c (Biose, 2005). These hardwoods were available in large quantity in Benue state, Nigeria before but now scarce. No one knows whether its scarcity could be attributed to poor forestry management practice. Smallidge and Goff (1998) explained forestry management as the branch of forestry that is concerned with the over all administrative, economic, legal and social aspects especially in the area of silviculture, protection and forestry regulation. This includes management for aesthetics, fish, recreation, urban values, water, wilderness, wood products, forest genetic resources and other forest resources values. Forestry management practice is a set of preventive measures that help to

control soil erosion resulting from human distances (https://en.wikipedia.org/wiki/forest-management). Forestry management practice helps in maintaining trees in the forest by preserving the nutrient in the soil for productivity in relation to tree growth.

Causes of hardwood scarcity

These are so many factors that cause scarcity of hardwood. These include deforestation, high demand for firewood, road construction, high demand for paper and furniture industries, clearing land for commercial and industrial development (Ahmed, 2008). With continue illegal logging activities in the forests or forest reserves, forest management practice will continue to fail and this will effect the production of forest resources (Sackey, 2007). It was observed that lack of nutrients in the soil can cause hard wood scarcity by causing stunted growth. Munsell (2015) disclosed that soil is very important resources for living organisms. For instance, it is a vital part of forest ecosystem providing a base for trees by supplying nutrients and minerals necessary for them to grow and thrive. It was also observed that bad road condition linking forest to cities can cause hardwood scarcity in the markets.

Statement of the problem

Hardwood scarcity in Benue state has become a serious problem to furniture industries and other woodworkers in the state while the state is located in the north central zone of Nigeria situated in the tropical region. The state is expected to produce hardwood for its citizenry but reverse is the case. This has made hardwood to be very expensive and unaffordable to woodworkers. One wonders whether this hardwood scarcity could be attributed to poor forestry management practice in Benue state, Nigeria.

Objectives of the study

The objectives of the study are to identify forestry management practices that will improve hardwood production in Benue state, Nigeria. Specifically, the study sought to:
Identify the causes of hardwood scarcity in Benue state, Nigeria.
Determine forestry management practices that will improve hardwood production in Benue state, Nigeria.

Research question

The following research questions guide the study.
What are the causes of hardwood scarcity in Benue state, Nigeria?
What kind of forestry management practice will aid in improving hardwood production in Benue state, Nigeria?

Hypothesis

The hypothesis was formulated and tested at 0.05 level of significance.
HO_1: There is no significant difference in the mean responses of forestry leads of department sections and forest field workers on forestry management practices for improving timber production in Benue state.

Methodology

Survey research design was adopted for the study. The study was carried out in Benue state, Nigeria the population for the study was drawn from the Heads of department (forestry) Ministry of Agriculture, Heads of Forestry section in the local government council and forest field workers. The total population for the study was one hundred and forty eight (148) and all the respondents were used i.e Heads of Department (forestry) 13, Heads of Forestry section (Local Government Council) 13, forestry field workers such as Forest Officers 13, Forest Superintendent15, Forest Technologist 10, forest guards 28, Forest Rangers 18, Forest Over Seers 6, Forest Assistants 10, Forest Attendants 12. All the population was used for the study. Systematic random sampling technique was applied in selecting 13 out of 23 local government areas. A structured questionnaire was used for data collection. The instrument was subjected to face and content valid action by three experts. Two experts from Wood Technology Section of Federal University of Technology, Minna, Nigeria and one expert from Forestry department, University of Agriculture, Makurdi, Nigeria. Cronbach alpha formula was used to determine the reliability coefficient of the instrument and it was found to be 0.89. The instruments were administrated to the respondents using three research assistants. out of 148 questionnaire given to respondents, 144 were returned i.e 97.30% return rate. The data were analyzed using mean, standard deviation and Z- test statistical tool. Z- test statistics was used to test hypothesis at 0.05 level of significance based on the four point rating scale of Strongly Agree (SA) 4 Points, Agree (A)3, Disagree (SD) 2 points , strongly Disagree (SD) 1 point. Any item have mean score of 2.50 and above was regarded as agreed while those have mean score below 2.50 were regarded as disagreed. The null hypothesis was rejected when the Z- calculated was more than1.98 while items were accepted when the Z- calculated was below 1.98.

Results

Research question 1: What are the causes of hardwood scarcity in Benue state, Nigeria? Data answering this question is presented in table 1.

Table 1. Mean responses of respondents on the causes of hardwood scarcity in Benue state, Nigeria. $N_1 = 26$, $N_2 = 122$

S/N	CAUSES	$\overline{X}_1$	SD_1	$\overline{X}_2$	SD_2	REMARK
1.	High demand for firewood	3.98	0.13	4.00	0.00	Agreed
2.	Clearing land for residential buildings	1.55	0.97	3.03	0.21	Disagreed
3.	Illegal logging	3.84	0.37	3.76	0.46	Agreed
4.	Failure in complying with forestry rules and regulation	3.52	0.34	3.55	0.92	Agreed
5.	Lack of silvicultural practice	3.12	1.09	2.98	1.14	Agreed
6.	Few timber plantation in the area	3.90	0.31	3.88	0.33	Agreed

Key

$\overline{X}_1 =$ Mean of forest field workers

$\overline{X}_2 =$ Mean of Heads of Forestry Departments and Heads of Forestry Sections

$N_1 =$ Number of forest field workers

$N_2 =$ Number of Heads of Forestry Departments and Heads of Forestry Sections

The analysis in table 1 reveals that respondents agreed with item 1,2,3,4,6 and disagreed with items 2. This means scarcity of hardwood in Benue state, Nigeria is not as a result of clearing land for residential buildings.

Table 2: What kind of forestry management practice will aid in improving hardwood production in Benue state? The data answering this question is presented in table 2.

Table 2. Mean responses of respondents on the kind of forestry management practice that will aid in improving hardwood production in Benue state. $N_1 = 26$, $N_2 = 12$

S/N FORESTRY MANAGEMENT PRACTICE	$\overline{X}_1$	SD_1	$\overline{X}_2$	SD_2	REMARK
Control the growth and health of hardwood trees in the forest.	3.91	0.28	3.95	0.22	Agreed
Monitor illegal loggers using villagers and circuit television.	3.50	0.96	3.31	1.07	Agreed
Increase timber plantation in the area	3.72	0.70	3.21	1.05	Agreed
Adopting single tree selection method of harvesting	3.97	0.18	3.95	0.22	Agreed
Adopt group selection method of harvesting	2.16	0.95	1.83	0.99	Disagreed
Remove low grade species and replace with hardwood species in the forest.	3.90	0.31	3.90	0.23	Agreed
Embrace taungya system of forestry Management	1.95	1.16	1.81	0.99	Disagreed

Key

$\overline{X}_1 =$ Mean of forest field workers

$\overline{X}_2 =$ Mean of Heads of Forestry Departments and Heads of Forestry Sections

$N_1 =$ Mean of forest field workers

$N_2 =$ Number of Heads of Forestry Departments and Heads of Forestry Sections

SD= Standard deviation

Table 2 disclosed that respondents agreed with items 1,2,3,4,6 and disagreed with items 5 and 7. This shows adopting group selection methods of harvesting and Tuangya system of forestry management can not improve hardwood production in Benue state, Nigeria.

Hypothesis testing

HO_1: There is no significance difference in the means responses of forestry heads of department section and forestry field workers on forestry management practice for improving hardwood production in Benue state. The data answering this question is present in table 3

Table 3. Z- test analysis of forestry management practices in for improving hardwood production in Benue state, Nigeria.

GROUP	N	$\overline{X}$	SD	df	Z_{cal}	Z_{cri}	DECISION
Forestry field workers	122	3.00	0.80	142	0.73	1.98	Accepted
Forestry Heads of Departments / Forestry Heads of Section	26	3.11	0.78				

Data contained in table 3 reveals that the Z calculated of 0.73 is less than the Z critical of 1.98. This implies that the null hypothesis was accepted. Therefore, there is no significant difference in the mean responses of Forestry Heads of Department / Heads of Forestry sections and forestry field workers on forestry management practices for improving hardwood production in Benue state.

Discussion

In table 1, it was revealed that high demand for firewood, illegal logging and lack of silvilcultural practice contributed to hardwood scarcity in Benue state, Nigeria. Smallidge and Goff (1998) disclosed that best forest management practices should be adopted to achieve goals related to silviculture. It was disclosed in table 2 that control the growth and health of hardwood trees in the forest, can increase timber plantation thereby improving hardwood production in Benue state, Nigeria. It is important to make sure there are adequate nutrients in the soil, trim branches of trees and apply chemicals when needed to destroy pest and insects attacking trees toward healthy growth. Munsell (2015) also observed that soil is part of ecosystem, therefore, it should maintained to supply nutrients to trees in the forest.

Summary

From the research conducted, it is a fact that there is scarcity of hardwood in Benue State, Nigeria due to high demand for firewood, few timber plantations and lack of silvicultural practices also contribute to hardwood scarcity in the state. The rural dwellers and illegal logger should be enlightened about the relevance of hardwood to the society especially to furniture, paper and construction industries. If this scarcity of hardwood continues, it will cause a lot of havoc to furniture, construction industries and other users of hardwood. It is recommended that more timber plantation should be established by non governmental organization, federal and state government in Benue state, Nigeria. Villagers living closed to the forest should be involved by federal and state government to monitor illegal loggers to check their activities. Circuit television can also be used were possible to monitor illegal loggers. Stunted growth of low grade species in the forest should be removed and replace with hardwood species to increase the number of hardwood in the area. Federal and state government should encourage foresters to practice silviculture in order to control pest and remove debris in the forest. This can be done by providing adequate funds to the agency.

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