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Conservation Implications of Timber Supply Pattern in Ekiti State, Nigeria

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Abstract: The implications of timber supply pattern in Ekiti State of Nigeria, on the conservation of timber species was examined. A total of 53 timber species belonging to 20 different families were found to be supplied in the sampled area during the study. Thirty three of these species were found to be supplied regularly while 22 of them were found to be in high demand by respondents in the study area. Ninety five percent of these species were sourced from the free areas while those sourced from the reserves were mere 5%. Most of the timber species were indigenous species, only *Gmelina arborea* and *Tectonia grandis*, were exotics which were sourced from the reserves. 10 forest reserves abound in the state; most of them were highly exploited with a myriad of other problems that make them unproductive. Thus the study revealed that the demand for timber far exceeded the supply. Preference for timber species is now skewed towards species availability rather than choice as desired species and sizes could no longer be met. Most of the timber species are now endangered hence conservation strategies that could ensure their continuous supply was proposed.

Key words: Timber, supply pattern, conservation, Ekiti State, Nigeria

INTRODUCTION

Ekiti State (5°25'-8°20'N, 5°00'-6°00'E), located in the southwestern part of Nigeria (Kayode, 2002) has its vegetation consisting of the dry lowland rainforest and the derived savanna. 297.2 km² of the state's vegetation is under reservation as government forest reserves, unreserved forests known as free area measured 3,969.0 km² (Falaye *et al.*, 2006) while the total land area of the state is 7000 km² (Anonymus, 1997). The state that has a population of 1.6 million has a total of 100 sawmills, all of which depend on timber as their raw materials. Apart from their usefulness for building construction and furniture, they served as a major source of income to individuals as well as the government. Thus the importance of timber resources as major forest products in the State cannot be over-emphasized.

Recently, there has been a gross increase in the demand for timber and wood products in the state (Anonymous, 2006), yet the current rate of deforestation in the state is unprecedented, while afforestation and reforestation rates had been so low. The continued timber cutting without replacement had been observed to be one of the factors responsible for biodiversity loss. Consequent on the above a study of the timber supply pattern becomes imperative. This study therefore aimed at the examination of the timber supply pattern in the study area with a view to determine its implications on the conservation of the timber species.

MATERIALS AND METHODS

Combinations of social surveys and direct field observations (Kayode *et al.*, 1997) were used in this study. Thirty sawmills located at different parts of the state were randomly selected. Visits were made to the selected sawmills at 2 weeks interval for a period of 12 months. At each visit, the timber logs in each sawmill were counted, source(s) of exploitation determined, the individual timber species was identified and the volume determined. Timber species found to be supplied regularly in the study

area were later classified into three volume groups as A>1000 m³, B 100-1000 m³ and C<100 m³. The timber species with high demand based on their utility values were identified and their characteristics defined by the respondents.

Secondary information were obtained from plank sellers, carpenters, joiners and forestry officials within the immediate vicinity of each sawmill, as well as from records available at the Department of Forestry, Ministry of Environment in the state.

RESULTS

A total of 53 timber species belonging to 20 different families were sampled during the study (Table 1), 33 of these species were found to be supplied regularly to the sawmills while 22 of them were found to be in high demand by respondents in the study area. Most (95%) of these species were sourced from the free areas while those sourced from the reserves were mere 5%. Most of the timber species were indigenous species. Only 2, *Gmelina arborea* and *Tectonia grandis*, were exotics. These exotic species were mostly sourced from the reserves. Field observation revealed that exploitation in the reserves were limited to licensed saw millers and registered timber contractors only. There were a total of 10 forest reserves in the state. Most of these reserves were highly exploited with only two presently recouping (Ogbese and Egbe Forest Reserves, Table 2). The difficult terrain in Ogotun Forest Reserve makes exploitation difficult in the reserve while an on-going land dispute in Eporo Forest Reserve was responsible for the government decision to make the reserve a protected one hence exploitation from the reserve is highly prohibited. The Isan/Ayede Forest Reserve is a woodland savanna. All these factors were responsible for the low timber productivity in these reserves.

Table 1: Checklist of timber species supplied to sawmills in Ekiti State

Timber species	Local name	Family
<i>Acacia albida</i> Delile	Ege	Mimosaceae
<i>Azelia africana</i> Sin. Ex Pers.	Apa	Caesalpiniaceae
<i>Albizia ferruginea</i> (Guill and Perr.) Benth	Ayinre	Mimosaceae
<i>Astonia boonei</i> De Wild	Ahun	Apocynaceae
<i>Aniugeria altissima</i> (A.Chev.) Aubrev. and Pellegr	Etutupa	Sapotaceae
<i>Anogeisus leocarpus</i> (DC.) Guill and Perr	Ayin	Combretaceae
<i>Antiaris toxicaria</i> Lesch	Oriro	Moraceae
<i>Berlinia coriacea</i> Keay	Apado	Caesalpiniaceae
<i>Berlinia grandiflora</i> (Vahl) Hutch & Dalziel	Abaa	Caesalpiniaceae
<i>Bombax bnonopoense</i> P. Beauv	Ponpola	Bombacaceae
<i>Brachystegia nigerica</i> Hoyle and APD	Jones Eku	Caesalpiniaceae
<i>Canarium schweinfurtii</i> Engl.	Origbo	Bnrseraceae
<i>Ceiba pentandra</i> (L.) Gaertn	Egigun/Araba	Bombacaceae
<i>Celtis zenkeri</i> Engl.	Ita	Ulmaceae
<i>Chrysophyllum albidum</i> G. Don	Agbalumo	Sapotaceae
<i>Cordia platythyrsa</i> Barker	Omo	Boraginaceae
<i>Daniella ogea</i> (Harms) Rolfe ex Holland	Ashuwole	Caesalpiniaceae
<i>Diospyros crassiflora</i> Hiern	Igidudu	Ebenaceae
<i>Distemonanthus benthamianus</i> Baill	Ayan	Caesalpiniaceae
<i>Entandrophragma angolense</i> (Welw.) C. DC.	Ijebu/Igedu	Meliaceae
<i>Entandrophragma cylindricum</i> (Sprague)	Sprague Ijebu	Meliaceae
<i>Entandrophragma utile</i> (Dawe and Sprague)	Sprague Jebo	Meliaceae
<i>Erythrophleum ivorensis</i> A. Chev.	Erun	Caesalpiniaceae
<i>Erythrophleum suaveolens</i> (Guill and Perr.) Brenan	Olu-obo/Obo	Caesalpiniaceae
<i>Gmelina arborea</i> Roxb <i>Gossweilerodendron</i>	Melaina	Verbenaceae
<i>balsamiferum</i> (Vermeesen) Harms Loshi	Erin/Moboran	Caesalpiniaceae
<i>Guarea cedrata</i> (A. Chev.) Pellegr.	Olofun	Meliaceae
<i>Guarea thompsonii</i> Sprague and Hutch.	Ofe-Olofun	Meliaceae
<i>Holoptelea grandis</i> (Hutch.) Mildbr. <i>Irviugia</i>	Inajoko	Ulmaceae
<i>gaboneensis</i> (Anrbry. Lecomte ex O' Rorke)	Baiill Oro	Irvingiaceae
<i>Khaya grandifoliola</i> C.DC.	Oganwo	Meliaceae
<i>Khaya ivorensis</i> A. Chev.	Oganwo	Meliaceae
<i>Lophira alata</i> Banks ex P. Gaertn	Ekki	Ochnaceae
<i>Lovoa trichilioides</i> Harms	Akoko Igbo	Meliaceae

Table 1: Continued

Timber species	Local name	Family
<i>Mansonia altissima</i> (A.Chev.) A. Chev.	Ofun	Sterculiaceae
<i>Melicia excelsa</i> (Welw.) Benth.	Iroko	Moraceae
<i>Mitragyna ciliata</i> Aubrev. and Pellegr.	Abura	Rubiaceae
<i>Mitragyna stipulosa</i> (DC.) Kuntze	Ewe-Obi	Rubiaceae
<i>Nauclea diderrichii</i> (De Wild and T. Durand) Merr.	Opepe	Rubiaceae
<i>Nesogordonia papaverifera</i> (A. Chev.) Capuron	Otutu/Ole	Sterculiaceae
<i>Oxystigma oxyphyllum</i> (Harms) J. Leonard	Lolagbola	Caesalpiniaceae
<i>Piptadeniastrum africanum</i> (Hook.f) Brenan	Agboin	Mimosaceae
<i>Pterocarpus soyauxii</i> Taub.	Osun-pupa	Papilionaceae
<i>Pterocarpus osun</i> Craib	Osun	Papilionaceae
<i>Pterygota macrocarpa</i> K. Schum.	Oporoporo	Sterculiaceae
<i>Pycnanthus angolensis</i> (Welw.) Warb	Akomu	Myristicaceae
<i>Ricinodendron heudelotii</i> (Baill.) Pierre ex Heckel	Potopoto	Euphorbiaceae
<i>Steculia oblonga</i> Mast.	Orodo/Oroforofo	Sterculiaceae
<i>Steculia rhinopetala</i> K.Schum	Orodo	Sterculiaceae
<i>Tectonia grandis</i> L. f.	Tiiki	Verbenaceae
<i>Terminalia ivorensis</i> A. Chev.	Idigbo	Combretaceae
<i>Terminalia superba</i> Engl. and Diels	Afara	Combretaceae
<i>Triplochiton scleroxylon</i> K. Schum	Arere	Sterculiaceae

Table 2: Forest reserves located in Ekiti State, Nigeria

Forest reserve	Location (Local Government Area)	Size (km ²)	Condition of the reserve
Ogbese	Ado-Ekiti	72.52	Highly exploited and now recouping
Egbe	Gboryin	10.22	Highly exploited and now recouping
Eda 1 and 2	Ekiti East	9.06	Forest research plot presently prevented from exploitation
Ogotun	Ekiti South West	15.69	Less exploited but have difficult terrain thus hamper proper utilization
Aramoko	Ekiti West	19.66	Highly exploited
Ikere	Ikere	14.19	Highly exploited
Ise	Ise-Orun	56.77	Highly exploited
Little Ose	Emure	26.62	Highly exploited
Eporo	Emure	46.62	Presently protected from exploitation
Isan/Ayede	Oye	28.85	Woodland savanna

Table 3: Volume classification of frequently supplied Timber Species in Ekiti State, Nigeria

A (>1000)	B (100-1000)	C (<100)
<i>Albizia ferruginea</i>	<i>Azelia africana</i>	<i>Anogeisus leocarpus</i>
<i>Antiaris africana</i>	<i>Alstonia boonei</i>	<i>Diospyros crassiflora</i>
<i>Brachystigia nigerica</i>	<i>Canarium schweinfurtii</i>	<i>Lovoa trichilioides</i>
<i>Ceiba pentandra</i>	<i>Chrysophyllum albidum</i>	<i>Nauclea diderrichii</i>
<i>Celtis zenkeri</i>	<i>Cordia platythyrsa</i>	
<i>Entandrophragma ntile</i>	<i>Daniella ogea</i>	
<i>Khaya grandifolia</i>	<i>Erythrophloeum ivorensis</i>	
<i>Mansonia altissima</i>	<i>Gmelina arborea</i>	
<i>Melicia excelsa</i>	<i>Holoptelea grandis</i>	
<i>Pterygota macrocarpa</i>	<i>Mitragyna stipulosa</i>	
<i>Steculia rhinopetala</i>	<i>Nesogordonia papaverifera</i>	
<i>Terminalia superba</i>	<i>Piptadeniastrum africanum</i>	
<i>Triplochiton scleroxylon</i>	<i>Pterocarpus osun</i>	
	<i>Pycnanthus angolensis</i>	
	<i>Ricinodendron heudelotii</i>	
	<i>Terminalia ivorensis</i>	

Table 3 shows the volume classification of the 33 regularly supplied timber species in the study area. 13, 16 and 4 timber species, representing % of the species were in Groups A, B and C volume categories respectively. A number of factors were found to be responsible for the demand of the timber species by the relevant stakeholders. These factors included durability, hardness, permeability to nails and screws, sawing and gluing. Table 4 shows the various characteristics defined for 22 timber species that were highly demanded by the relevant stakeholders in the study area. These species were pure indigenous.

Table 4: Species characteristics defined for highly demanded timber species by stakeholders in Ekiti State, Nigeria

Species	Defined characteristics	End use
<i>Azelia africana</i>	Hard, resistant to fungi and insect, Keep nails and screws very well.	Used for furniture, interior and exterior joinery, heavy carpentry and veneers.
<i>Albizia feruginea</i>	Hard, resistant to fungi and insect, Take nails and screws without splitting.	Used for furniture, interior and exterior joinery, heavy carpentry and veneers.
<i>Alstonia boonei</i>	Soft, liable to insect attack and fungi, Sawing easily.	Used for light furniture, light carpentry and plywood cores.
<i>Antiaris africana</i>	Soft, perishable, Easy to work with using various tools, Nails and screws satisfactorily.	Used for interior joinery, plywood, plywood cores and veneers.
<i>Canarium schweinfurthii</i>	Soft, susceptible to fungi and termites, but resistant to insect when dried.No difficulty with nails and screws.	Used for furniture, interior joinery, interior structures and veneers.
<i>Cordia platythyrsa</i>	Soft, seasoning rapidly and well, Resistant to fungi and insects, Sawing easily and well hold nails and screws satisfactory.	Used for furniture, interior joinery and light carpentry.
<i>Daniella ogea</i>	Seasons well and rapidly, soft-medium hard, Not resistant to fungi and insects, Hold nails and screws very well.	Used for cheap furniture, light carpentry, plywood and veneers.
<i>Entandrophragma cylindricum</i>	Seasoning dries slowly, Medium hard, Medium resistant to fungi and insects, Nails and screws work easily.	Used for furniture, exterior and interior joinery and veneers.
<i>Gossweilerodendron balsamiferum</i>	Timber seasons fairly rapidly, Medium hard, Heartwood resistant to fungi and insects, Sawing often required oiling, Takes nails and screws very well.	Used for interior joinery, floors, carpentry, plywood and veneers.
<i>Khaya ivorensis</i>	Seasons easily but dries rather slowly, Soft, moderately resistant to fungi and insects attacks, Nails and screws penetrates easily and keep well.	Used for furniture, interior and exterior joinery and veneers.
<i>Mansonia altissima</i>	Seasons well, sawing easily, Medium hard, Resistance to fungi and insect attack.	Used for furniture, interior and exterior joinery, Carpentry, plywood and veneers.
<i>Melicia excelsa</i>	Hard, seasoned well without splits and deformations, Moderately durable to fungi and insect attacks, Sawing very well, Nails and screws penetrate well, carpentry and laminated.	Used for floors, interior and exterior joinery, wood.
<i>Nanlea diderrichii</i>	Seasoned well and dried quickly, Medium hard. Resistance to insects and fungi, Nails and screws penetrate easily and keep well.	Used for floors, interior and exterior joinery, carpentry and veneers.
<i>Nesogordonia papaverifera</i>	Medium hard, Resistance to fungi, Moderately resistance to insects, Nails and screws penetrate easily and keep well.	Used for floors, interior joinery, carpentry and veneers.
<i>Piptadeniastrum africanum</i>	Seasoned well but dried slowly, Medium hard, Resistance to fungi and insect attacks, Sawing is not easy, Nails and screws penetrate easily and keep well.	Used for floors, interior joinery, carpentry and plywood.
<i>Pterygota macrocarpa</i>	Medium hard, Not resistance to fungi and insect attacks, Sawing easily without difficulties, Nails and screws penetrate easily and keep well.	Used for joinery, light carpentry, sliced and peeled veneers and plywood.
<i>Pterocarpus osun</i>	Medium hard, Resistance to insects and fungi, Sawing easily, Work well with all tools.	Used for furniture, floors, exterior and interior joinery and sliced veneers.

Table 4: Continued

Species	Defined characteristics	End use
<i>Pycnanthus angolensis</i>	Very soft, Susceptible to fungi and insects attacks, Nails and screws penetrate easily and keep well.	Used for interior joinery, blind wood, veneers and plywood.
<i>Steculia rhynopetala</i>	Hard, not very durable, Nails and screw does not penetrate well.	Used for furniture, floors, interior and exterior joinery, carpentry and plywood.
<i>Terminalia ivorensis</i>	Seasons very well, Soft-medium hard, Resistance to fungi and insects, Nails and screws penetrate easily and keep well.	Used for furniture, interior joinery, carpentry, veneers and plywood.
<i>Terminalia superba</i>	Season easily and fast, Soft-medium hard, Not resistance to insects and fungi, Nails and screws penetrate easily and keep very well.	Used for furniture, interior joinery, lamellate wood, plywood and sliced veneers.
<i>Triplochiton scleroxylon</i>	Seasons easily, Very soft, Susceptible to fungi and insect, Nails and screw penetrate very easily and keep well.	Used for furniture, interior joinery, plywood and veneers.

DISCUSSION

Thus the study revealed that the demand for timber far exceeded the supply. This has resulted to indiscriminate logging of the forest especially in the free area that constituted the major source of supply in the study area. Preference for timber species is now skewed towards species availability rather than choice as desired species and sizes could no longer be met. Species presently being supplied are of diminished quality and quantity. Most of them are now endangered hence they need to be sustainably utilized so that they could meet the needs of the present and future generations. Conservation strategies that would enhance the attainment of this objective need to be formulated. These might include the need, for urgent and intensive research activities into the silviculture of the indigenous timber species, aggressive reforestation excise especially in the reserves, establishment of more forest reserves, massive afforestation program in the study area, review of existing forest laws and regulations with particular emphasis on the sanitization of logging and sawmill operations, public enlightenment campaign with emphasis laid on the review of the existing conservative attitude that discriminate against the use of exotic timber species. At present, the uses as well as preference are skewed towards the indigenous timber species.

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