



**AN ASSESSMENT OF THE
DEMAND AND SUPPLY OF
Mansonia altissima IN
IBADAN, NIGERIA**

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Abstract

This study examines the demand and supply of *Mansonia altissima* sawn wood in Bodija Timber Market, Ibadan, to assess their implications for species conservation. *Mansonia altissima*, a valuable tropical hardwood, faces overexploitation due to rising demand and limited regeneration. Data were collected from 200 timber marketers using questionnaires and field surveys. Descriptive and inferential statistics, including Pearson correlation and paired sample t-tests, were used to analyze the relationship between supply and demand. Results showed a strong positive correlation ($r = 0.980$, $p < 0.01$), indicating that limited

supply directly affects sales. Major marketing challenges identified include lack of capital, limited stock availability, transportation difficulties, and weak institutional support.

Keywords: *Mansonia altissima*, demand and supply, timber trade, conservation, Bodija market, sustainable forest management.

Although market associations assist traders through price regulation, information sharing, and legal aid, problems like inadequate storage, competition, and regulatory pressure persist. The study concludes that unsustainable exploitation threatens *Mansonia altissima* populations. It recommends improved credit facilities, better market infrastructure, and strict enforcement of sustainable forest management policies to balance commercial needs with long-term species conservation.

Introduction

Tropical forests are globally recognized for their biodiversity, ecological importance, and contribution to human livelihoods. Among the most economically significant products of these forests is timber, which has remained a central resource in construction, furniture-making, and global trade. The Food and Agriculture Organization (FAO, 2010) notes that timber is the most commercially valuable forest product, with its extraction having profound impacts on forest structure and sustainability. In many developing countries, growing population pressure, increasing standards of living, and the rapid expansion of wood-based industries have led to an unsustainable surge in the demand for timber products. While developed countries have embraced afforestation and sustainable forest management practices to mitigate forest degradation, deforestation in many parts of sub-Saharan Africa continues to outpace reforestation efforts.

Nigeria, endowed with a rich diversity of indigenous hardwood species, is experiencing growing concern over the depletion of valuable timber species. Among these is *Mansonia altissima* (A. Chev.), commonly known as African black walnut or mansonia. This species is renowned for its high-quality wood, characterized by durability, fine texture, resistance to termite attacks, and low permeability traits that make it suitable for furniture, cabinet work, decorative veneer, and boatbuilding (PROTA, 2017). Historically, *Mansonia altissima* has been commercially exploited since the 1930s, with exports initially serving as substitutes for walnut wood in international markets. Its aesthetic appeal, utility in musical instruments and luxury furniture, and resistance to biological decay have maintained high demand both locally and abroad (Woodard & Milner, 2016; onlinelibrary.wiley.com).

Despite its economic and cultural importance, *Mansonia altissima* is increasingly under threat. The International Union for Conservation of Nature (IUCN) has listed the species as endangered due to over-exploitation and insufficient regeneration in its native habitats. The expansion of timber markets and the continuous preference for *Mansonia altissima* in places like Ibadan metropolis particularly in major wood markets such as Bodija have further heightened pressure on the species. Studies have shown that selective harvesting and the absence of replanting efforts are contributing to its population decline in the wild (Famuyide, 2012).

While research efforts have explored the germination ecology, genetic diversity, and pest resistance of *Mansonia altissima* (Akinagbe *et al.*, 2007; Maku *et al.*, 2014; Aina-Oduntan *et al.*, 2018), there remains a significant gap in understanding the dynamics of its demand and supply in domestic markets. Specifically, there is limited empirical information on how economic forces such as market demand, availability, pricing, and trade practices are

influencing its sustainability. According to Arowosoge *et al.* (2010), a persistent imbalance in timber supply and demand has been noted across Nigeria’s forest-based industries, largely due to the dwindling productivity of natural forests. This study, therefore, aims to investigate the demand and supply dynamics of *Mansonia altissima* in the Ibadan metropolis, with a focus on Bodija Sawnwood Market. The objectives are to estimate current demand levels, identify factors influencing demand and supply, assess the state of the species in timber trade, and evaluate the implications of these trends on species conservation. Understanding these market dynamics is essential for informing sustainable harvesting policies and for developing management strategies that can ensure the long-term availability of *Mansonia altissima*, while supporting livelihoods dependent on timber trade.

Methodology

Study Area

This study was conducted in the Bodija Sawnwood Market, located in Ibadan North Local Government Area, Oyo State, Nigeria. Bodija market is one of the largest and most active timber markets in the southwestern region of Nigeria and serves as a major distribution center for hardwoods, including *Mansonia altissima*.

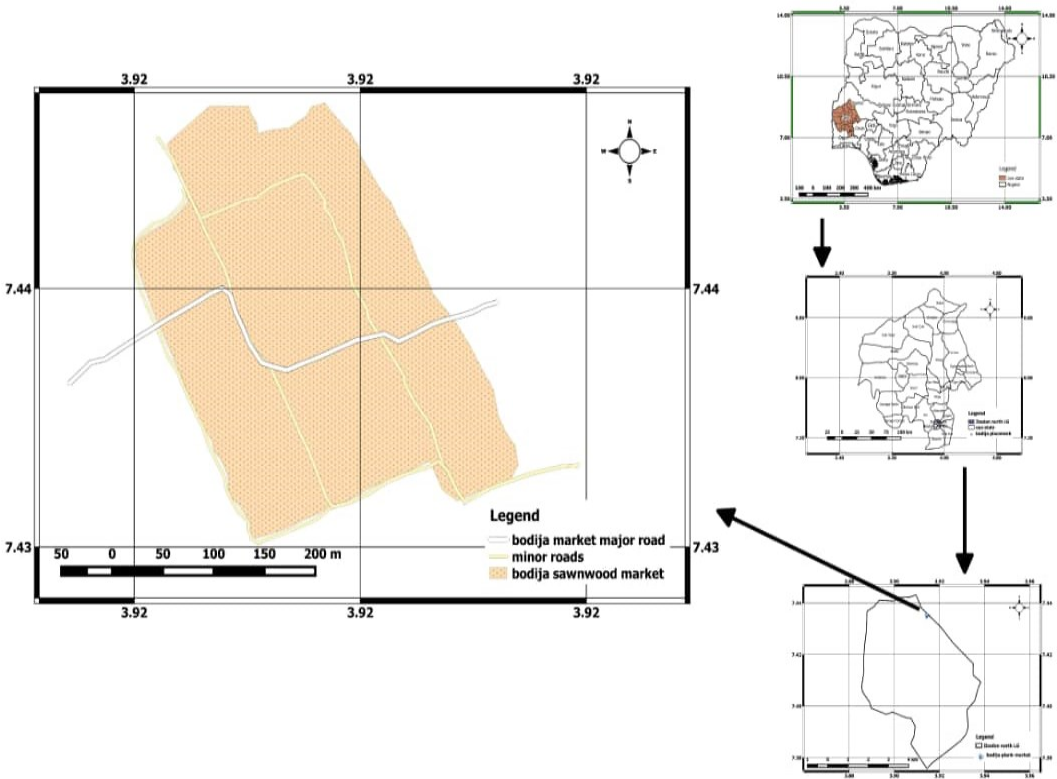


Figure 1: Map of the study area

Research Design

A descriptive survey research design was employed for this study. This design was chosen to collect both qualitative and quantitative data from sawmill operators, timber merchants, and market stakeholders involved in the *Mansonia altissima* trade.

Sampling Technique

A multistage sampling technique was used. First, the Bodija market was divided into five zones based on the concentration of timber dealers. From each zone, 40 respondents were randomly selected, comprising timber sellers, buyers, and processors, resulting in a total of 200 respondents.

Data Collection

Primary data were collected using well-structured questionnaires and key informant interviews. The questionnaire captured demographic information, volume of sawn wood supplied, sales trends, seasonal patterns, supply sources, challenges faced, and conservation awareness.

Data Analysis

Descriptive statistics such as frequencies, means, and percentages were used to analyze the demographic and trade characteristics. Inferential statistics including Pearson's correlation and t-tests were employed to determine the relationship between demand and supply variables and their implications for conservation. The analysis was carried out using SPSS (Statistical Package for the Social Sciences) version 23.

Results and Disussion

This study investigated the demand and supply dynamics of *Mansonia altissima* sawnwood in the Bodija market, Ibadan, based on responses from 200 sawnwood sellers. The findings revealed critical insights into demographic characteristics, market operations, challenges, and the role of market associations in shaping the timber trade.

Demographics and Workforce Composition

In Table 3.1 the sawnwood trade in Bodija is overwhelmingly male-dominated (93%), aligning with Sekumade and Oluwatayo (2011), who observed that capital-intensive and labor-demanding trades in Nigeria are often male-driven. The dominance of middle-aged individuals (77% aged 41–50 years) reflects the experience and stamina required for this work. Most respondents (72%) had secondary education, indicating a trend where formal

education is not a key determinant for entry into the trade (Ogunleye et al., 2015). Ethnically, the market reflects regional demographics, with 89.5% Yoruba traders.

Table 1: Demographic Characteristics of Respondents

Variable	Category	Frequency	Percentage (%)
Gender	Male	186	93.0
Female	14	7.0	
Age Group	21–30	24	12.0
31–40	44	22.0	
41–50	77	38.5	
51 and above	55	27.5	
Education	No Formal Education	15	7.5
Primary	39	19.5	
Secondary	89	44.5	
Tertiary	57	28.5	

Field survey, 2022

Market Dynamics and Timber Preference

Mansonia altissima is the most marketed species due to its superior qualities such as strength, durability, and suitability for furniture production (Ojo et al., 2019). In table 3.2, over 86% of respondents cited high demand as their main reason for trading in it. The timber is primarily sourced from government plantations in Ondo and Ogun States, highlighting regional supply concentration due to deforestation in other areas (Oladele, 2014). However, only 24.8% of traders are licensed, suggesting a prevalent informal trade sector, echoing regulatory challenges noted by Nwachukwu (2016). Additionally, the majority (84%) of traders receive *Mansonia altissima* in sawnwood form on a weekly or monthly basis, supporting earlier insights into the market's adaptive sourcing (Ogunleye et al., 2015).

Table 2: Frequencies distribution on why is *Mansonia altissima* a major species respondents’ trade in?

QUESTION	Label	Freq. (f)	Percent (%)
The reason for selling <i>Mansonia</i>	Easily available	16	8.0
	It is in high demand	172	86.0
	Others	12	6.0
TOTAL		200	100

Source: Field survey 2022

Role of Market Associations

Results in Table 3.3 shows that the association has affected the business of the respondents through support they received, price leverage, information dissemination, disputing settling, financial support, legal support and construction assistance. Market associations provide vital support functions, with nearly 49% of traders benefiting from general support, and others receiving information dissemination, financial aid, and legal support. These roles are essential in maintaining market stability and resilience, as highlighted by Arowosoge *et al.* (2010) and Famuyide (2012). Associations thus function as collective bargaining platforms and sources of informal regulation and capacity-building (Akinagbe *et al.*, 2019).

Table 3: Frequencies distribution on how the association affects the respondents' Business

Ways	Frequency	Percentage (%)
Construction And Assistance	2	1.0
Dispute Settling	2	1.0
Financial Support	26	12.9
Information Dissemination	42	20.0
Legal Support	8	4.0
Misunderstanding Settlement	5	2.5
Price Leverage	7	3.5
Support	99	49.0
Source: Field Survey (2022)		

Relationship between Quantity Supplied and Quantity Demand of *Mansonia altissima*

Results in table 3.4 shows that the mean quantity of wood supplied to sawnwood marketers is 3934.8684 and standard deviation of 5568.91980 and the mean quantity sold (demand) is 4488.2105 and standard deviation of 5548.83443. The samples T test shows a mean difference of -553.34211. The correlation table shows a Pearson value (r) of 0.980 and a significant level (p- value) of 0.000. Since $p < 0.01$, we say there is a significant relationship between the monthly quantity supplied and sold (demand). It also revealed that there is a strong positive relationship between monthly quantity supplied and demanded. This means the higher the supplied, the higher the demand and the lower the supplied, the lower the demand and vice-versa. The sawnwood sellers can only sell the quantity they have been supplied despite the increasing demand for sawnwood. The supply gap confirms earlier studies that observed increasing pressure on timber species due to overharvesting and demand surges (Woodard & Milner, 2016). Factors

contributing to the rising demand for timber products include rapid population growth, expansion in the construction sector, and increasing household income levels. Recent studies have shown that Nigeria’s growing population and urbanization have significantly driven up the need for housing, furniture, and infrastructure, leading to higher timber consumption (Ajao, 2024; ITTO, 2025; Owoeye *et al.*, 2025). Meanwhile, financial hardship and seasonal constraints were the main reasons cited by the 19% who noted no increase in demand (Adeniran & Akinbode, 2020).

Table 4: Independent Sample Test and Correlation analysis between Quantities Supplied and Quantities Demanded

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Total Supply	3934.8684	114	5568.91980	521.57713
	Total Demand	4488.2105	114	5548.83443	519.69596

Field survey, 2022

Correlation between Demand and Supply

Pearson’s correlation analysis revealed a strong positive correlation ($r = 0.980$, $p < 0.01$) between the demand and supply of *Mansonia altissima*, indicating that supply generally rises in response to increased demand.

Table 5: Correlation between Demand and supply

		Total Supply	Total Demand
Total Supply	Pearson Correlation	1	.980**
	Sig. (2-tailed)		.000
	N	125	114
Total Demand	Pearson Correlation	.980**	1
	Sig. (2-tailed)	.000	
	N	114	167

**. Correlation is significant at the 0.01 level (2-tailed).

Source: Field Survey (2020)

Factors responsible for the increase in the demand

Results in Table 3.5 shows that the factors responsible for increase in demand for the past two years are season, increase in construction of buildings, increase in population, the usage of the plank, improved standard of living and income growth. A range of factors affect the demand for wood and wood products, including the price of the products themselves; the price of substitute products; population and income levels; and trends in

consumer preferences (Food and Agriculture Organization [FAO], 1999; Adedire *et al.*, 2023; Ogunwusi *et al.*, 2025). There is a statistically significant shortfall in supply relative to demand, with an average monthly supply of 3,934.87 units compared to a demand of 4,488.21 units ($r = 0.980$, $p < 0.01$). The supply gap confirms earlier studies that observed increasing pressure on timber species due to overharvesting and demand surges (Woodard & Milner, 2016). Factors contributing to rising demand include population growth, construction booms, and rising income levels, consistent with Adedire *et al.* (2023). Meanwhile, financial hardship and seasonal constraints were the main reasons cited by the 19% who noted no increase in demand (Adeniran & Akinbode, 2020).

Table 6: Frequency distribution on factors responsible for increase in demand by the Respondents.

Reasons for increase demand	Frequency	Percentage (%)
NO increase	38	19.1
Construction of Buildings	14	7.0
Improved Standard of Living	3	1.5
Increasing Population	13	6.4
Its Utilization	26	13.0
Political And Economic Stability	2	1.0
Season	104	52.0
TOTAL	200	100

Source: Field Survey (2020)

Operational Challenges

Results in Table Table 3.6 shows that 17.3% of the respondents' said the major challenges they face is lack of capital, 17.8% said unavailability of stock, 32.5% said level of demand, 14.7% said lack of Transportation, 7.1% said Storage, 2.5% said Competition, 3.6% is Market Association's requirement, 4.6% said Government charges and regulations and 17.3% are faced with other challenges. These results show that the sawnwood sellers do not have enough capital to invest in sawnwood marketing. This invariably leads them to borrowing loans and the high interest paid on loans pose a risk to profiteering in the business. In addition, some of the sawnwood sellers who are able to invest into the business are faced with unavailability of stock. These findings support Aina-Oduntan *et al.* (2018) and Akinagbe *et al.* (2019), who emphasized financial and logistical constraints in the timber sector. Inadequate capital and poor infrastructure limit the capacity to meet demand or scale operations.

Table 7: Frequencies distribution on challenges faced as a Sawn Wood Marketer

Label	Freq. (f)	Percent (%)
Lack of capital	34	17
Unavailability of stock	35	17.5
Level of Demand	64	32
Transportation	29	14.5
Storage	14	7.
Competition	5	2.5
Market Association’s Requirements	7	3.5
Government Charges and Regulations	9	4.5
Others	3	1.5
Total	200	100

Source: Field Survey (2020)

Discussion

The findings from this study indicate a growing demand for *Mansonia altissima* in the Bodija Sawnwood Market, largely driven by its desirable properties such as durability and resistance to pests. This aligns with previous research by Kareem et al. (2018) and PROTA (2017), which highlighted the species' value in high-end construction and furniture making. However, the high demand is not matched with a stable and sustainable supply, as the resource is subject to seasonal availability and logistical challenges. The strong positive correlation observed between demand and supply suggests that traders increase sourcing efforts in response to market demand. Nonetheless, limitations such as poor road access during the rainy season, regulatory constraints, and lack of incentives from the government restrict continuous supply. These issues echo the challenges identified by Akinagbe et al. (2019), who emphasized infrastructural deficiencies and weak policy enforcement as key barriers to sustainable forestry practices in Nigeria.

A significant concern highlighted by this study is the low level of conservation awareness among timber merchants. With only 32% of respondents aware of the endangered status of *Mansonia altissima*, it is evident that conservation messages are not reaching key stakeholders. This lack of awareness is critical, as it hampers the implementation of sustainable harvesting practices. As noted by Arifalo (2024), awareness and education are vital in engaging local actors in forest conservation efforts.

Moreover, the seasonal dynamics in both supply and sales reflect the vulnerability of the *Mansonia altissima* trade to climatic and infrastructural factors. While supply peaks in the dry season due to better forest access, sales are higher during the rainy season when construction activities increase. This mismatch can lead to fluctuations in market prices

and potential overharvesting during peak supply periods to compensate for expected sales surges. Similar market-driven pressures have been reported by FAO (2010) in studies of hardwood species trade across West Africa.

The lack of government support, particularly in the form of incentives for sustainable harvesting and investments in rural road infrastructure, further exacerbates the issue. As highlighted by Agbeja and Opii (2005), policy support and infrastructure development are essential for aligning forest-based trade with conservation goals.

Overall, the results of this study demonstrate that while *Mansonia altissima* remains commercially valuable, its continued exploitation without sustainable practices poses a serious threat to its conservation. Strategic interventions are needed to ensure that trade in this species supports both economic livelihoods and ecological integrity.

Conclusion

This study has highlighted critical dynamics in the demand and supply of *Mansonia altissima* sawnwood in the Bodija timber market, Ibadan. The findings show that while market associations provide important support—ranging from financial aid to information sharing and dispute resolution—major challenges such as capital shortages, stock unavailability, and logistical constraints continue to hinder efficient timber marketing. A strong positive correlation between quantities supplied and demanded reveals that supply limits sales volume despite rising demand, indicating that insufficient supply contributes significantly to market shortages. Furthermore, demographic factors including sex, age, and location influence the supply-demand gap, suggesting that social and economic characteristics of marketers affect their ability to meet market needs. The results underscore the urgent need for integrated interventions to enhance sustainable supply chains, including improved access to finance, strengthened market associations, and better transportation and storage infrastructure. Sustainable management of *Mansonia altissima* requires coordinated efforts among forest managers, policymakers, and timber marketers to regulate harvesting, encourage reforestation, and monitor trade to prevent over-exploitation. By addressing these challenges, it is possible to balance the commercial utilization of *Mansonia altissima* with conservation imperatives, ensuring its long-term availability and supporting the livelihoods dependent on this valuable hardwood species.

Recommendations

The study suggests several recommendations to improve the sustainable management and marketing of *Mansonia altissima* in the Bodija timber market and other parts of Nigeria. These include:

- ◆ Enforcement of Forestry Laws and Regulations and adoption of sustainable harvesting practices
- ◆ Improving access to capital
 - i. Encouragement of Afforestation and Reforestation Programs
- ◆ Provision of Basic Infrastructure and Access Facilities especially good transportation system to provide easy access to forest resources at any time.
 - i. Strengthening market associations that will subsequently lead to an increase in market information dissemination, and further research should be conducted in sawn wood markets.

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