



Risks Assessment, Production and Trade of Processed Wooden Mortal from Hardy Plant Species in Nigeria's Vulnerable Semi-Arid Zone

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ABSTRACT

Most of the farming tools used by farmers in the semi-arid zones of Northern Nigeria including hoes, axes, and diggers with wooden handle are complimented by woods. The reliance on these basic tools by farmers has further accelerated the destruction of valuable tree species for the production of these tools/items. This study therefore, examined the production and trading of wooden mortal and pistil in a fragile ecological zone of Nigeria. Results indicated that the ravage production and trading of these tools is engaged exclusively by men aged 20 to 70, with most between 30 and 50, who have not attended formal school and have been in the business for over twenty years. The most preferred species used in the production were *Ficus platyphylla*, *Faidherbia albida*, *Vitellaria paradoxa*, *Prosopis africana*, *Balanites aegyptica*, *Lannea microcarpa*, *Daniellia oliveri*, *Vitex doniana*, *Diospyros mesfilipromis*, *Azalia Africana*, *Isobertina doka*, *Parkia biglobosa*, and *Ceiba pentandra*. It was found that from the highly matured tree, only 10 to 20 units are produced and each unit is traded at ₦5000 to ₦10000 Nigerian Naira at 10 to 30 units per month, with 30 to 50% of the plant biomass wasted and used as fuel wood

Keywords: Endangered plants; wooden items; vulnerability

INTRODUCTION

In most developing countries particularly in Africa, Latin America and part of Asia, population have continued to expand at a remarkable rate. Population growth is a major challenge to socio-economic and environmental sustainability in Nigeria as in many African countries. The environment of a place provides both material and basic conditions necessary for human and other species survival. Northern Nigeria has endowed the population with natural resources for Agriculture, trade and culture. A study on the threatened medicinal and economic plants of the Sudan Savannah in Katsina State North-western Nigeria has earlier revealed that loss of biodiversity in Nigeria is intense and distressingly more pronounced in some states like Kano, Jigawa, Katsina, Yobe states across north-western as well as north-eastern geopolitical regions of Nigeria (Abubakar *et al.*, 2014).

Plant diversity in dry and semi dry regions bordered with Niger Republic faced a lot of threat and persistent drought and desertification which will subsequently leads to soil erosion and distraction of the ecosystem entirely through loss of biodiversity (Abdullahi and Rusea, 2020). The antagonistic influence caused by the rampant cutting of trees includes loss of ground cover and incessant overgrazing by livestock has drastically reduced plant multiplicity in the fragile semi-arid zone of Nigeria. Notably, the plants destroyed were mostly threatened tree species *Neocarea macrophylla*, *Sclerocarya birrea*, *Detarium microcarpum*, *Prosopis Africana*, *Acacia africana*, *Acacia nilotica*, *Azadirachta indica*, *Khaya ivorensis*, *Parkia biglobosa* (Kwon-Ndung *et al.*, 2009; Gmaraldeen *et al.*, 2016; Chaikaew *et al.*, 2020; Zaku *et al.*, 2022).



The menace of continuous cutting of threatened tree species has necessitated national and international summits. For example, in June 1992, the United Nations held the Earth Summit at Rio de Janeiro, Brazil and adopted several resolutions including the Convention on Biodiversity. The 2022 UN Convention on Biological Diversity (CBD) held in Montreal, Canada restates the UN commitment to cardinal principles of the convention and finally agreed to protect 30 % of land and ocean by 2030 and the adoption of the Kunming-Montreal Global Biodiversity Framework. In Nigeria, the Savannah ecosystem is the most impacted by destruction of natural resources and loss of endemic species. In the last 5 decades, the vegetation of North West and North East regions has been degraded considerably (Pennington *et al.*, 2006; Jamala *et al.*, 2012; Osborne *et al.*, 2018; Meer *et al.*, 2022). A number of studies have reported that some plants and animal species in the two regions are at disturbing levels of population based on International Union for Conservation of Nature (IUCN) criteria for conservation (Chapman and Chapman, 2001; Burgess *et al.*, 2005; Bello *et al.*, 2019; Imarhiagbe *et al.*, 2020; Bamigboye *et al.*, 2022). Domestic energy need, plant products, fodder materials for livestock, timber, and other sundry tools are the drivers of natural resource degradation. In spite of efforts by governments at different levels to control over exploitation and mismanagement of the nation's natural resources, very little has been achieved over the years. Nature reserves, national parks, special centres/sanctuaries, specific gardens, enabling legislation and activities of Non-governmental organisations have provided little respite to forest resource conservation in Nigeria. It is worrisome to note that the age-old traditional practice of producing various traditional mortar, pestle, hoes and axe handles in addition to fire wood and furniture has persisted in the communities of

the North East and North West. The cutting down of highly matured or climax threatened tree species to produce tools, implements, and items for various purposes has continued. Various domestic items such as wooden mortar and pestle, wooden stools, handles of various farming tools are complimented by woods (Blench, 2013; Owoyemi *et al.*, 2016; Oriabure *et al.*, 2017). The reliance on these basic tools by farmers has further accelerated the destruction of valuable tree species. The use of plant species such as *Anogeissus leiocarpus*, *Daniellia oliveri*, *Albizia chevalieri*, *Detarium microcarpum*, *Vitex doniana*, *Diospyros mesfilipromis*, *Ficus Thoningi*, *Gmelina arborea*, *Azela Africana*, *Isobertina doka*, *Parkia biglobosa*, *Ceiba pentandra* and *Combretum micranthum* for the production of these tools has decimated the population of these species. Therefore, the continued removal and destruction of these and other species of economic, social and ecological significance could further deplete plant biodiversity and promote extinction of endangered species. Deforestation is a recurrent ecological issue in the Savannah and semi-arid ecological zone of Nigeria. The situation has caused vast areas devoid of vegetation with attendant socio-economic effects on the communities. Attempt to address the problem started in the 80s with the establishment of Afforestation Programme Coordinating Unit (APCU) for 12 States of Northern Nigeria including Kano. With the programme ended in the 1990s with no visible impact. At present no reliable data on the loss of biodiversity in the areas. Biodiversity is a global heritage, and its loss is a global challenge. Although a variety of phytochemical compounds, exudates, molecular products and genes have been extracted and used in drug & food industries, many other important products from some of the endemic plant species in the zones are yet to be discovered.



The study aimed at assessing the number of mortal and pistil produced per single threatened plant species, cost and quality parameters in relation to alternative equivalents.

MATERIALS AND METHODS

Study Area

The study was conducted in three popular local markets in Kano State – Nigeria located between latitude $11^{\circ}58'50''$ and $11^{\circ}98'18''$, longitude $8^{\circ}28'46''E$ and $8^{\circ}48'01''$ and altitude 486.5m. The three markets selected are Badume, Kura and Dambatta each attracts no less than 50,000 visitors weekly (Idris, 2016). The study area falls within the Sudan Savannah agro-ecological zone, which is characterized by two seasons (dry and wet seasons). The dry season comprises the harmattan period (low temperature, dry, windy, and dusty and sometimes with low visibility) and is sunny and hot, usually between October and May while the wet season is usually warm and humid with a variable rainfall pattern.

Sampling

A random sampling method was adopted where practitioners (wooden curve producers and marketers) of the production and marketing of mortal and pistils, wooden handles, stools, utensils, boards, e.t.c. were randomly selected. A semi-structured questionnaire supplemented with focus discussions was administered to 30 respondents who produce and trade traditional mortal and pistil made from woody trees. The respondents were residents of the Hausa-Fulani ethnic group.

Data Collection

Data were obtained using a series of semi-structured, open-ended questionnaires as well as focus discussion with the respondents. A local language (Hausa), the most widely spoken was used to construct

and administer the questionnaires and to collect the data from the respondents. Data on plant species used in the production, the most selected and appropriate, processing activities from start to finish products, marketing and subsequent uses of the processing waste, awareness on related modern tools, the future of the wooden tools production and marketing, awareness of existing prohibitions, protection and regulations on the use indigenous plant species, knowledge on degradation of ecosystem, and climate change.

RESULTS AND DISCUSSION

Results on demographic information obtained from the study was presented in Table 1 and indicated that the ravaged production and trading of Mortal and Pistil made from threatened plant species is engaged exclusively by males aged between 20 to 70 years with most of them between 30 to 50 years. In terms of educational qualification, majority of the respondents have not attended formal education and have been in the business for over twenty years moving from one market to another to trade the tools.

The most preferred species often used in the production of wooden mortal and pistil (Table 2) in the study are *Ficus platyphylla*, *Faidherbia albida*, *Vitellaria paradoxa*, *Prosopis Africana*, *Balanites aegyptica*, *Lannea microcarpa*, *Daniellia oliveri*, *Vitex doniana*, *Diospyros mesfilipromis*, *Azelia Africana*, *Isobertina doka*, *Parkia biglobosa* and *Ceiba pentandra*. These plant species used for the production were either matured or highly matured and typical hard wood tree plant species usually 40 – 60 years old. Furthermore, according to the respondents, trees are usually acquired for the production mortal and pistil through community lands and illegal encroachment into the protected ecological reserves.



Table 1: Demographic information of the respondents (Processors and marketers)

Respondent n = 30 Attribute	Preference	Frequency (F)
Sex	Male	30
	Female	00
Age Group (Year)	12 - 20	01
	20 - 30	03
	31 - 40	07
	41 - 50	09
	51 - 60	05
	61 - above	05
Level of education attained	Basic/Primary	10
	Secondary	06
	Diploma/NCE	02
	Informal Education	12
Respondent's Experience in the activity	1- 10 years	03
	11- 20 Years	05
	21 - 30 years	12
	31 - 40 years	06
	> 40 Years	04
Nature of respondent's business	Hawking	28
	Stationary	02

Source: Field Survey, 2022.

Table 2: Woody plant species used for processing of wooden mortar and pestle

Respondents n = 30 Attribute	Plant species	Local Name (Hausa)	Frequency (F)
	<i>Cassia sieberiana</i>	Marga	17
	<i>Ficus platyphylla</i>	Gamji	29
	<i>Faidherbia albida</i>	Gawo	20
	<i>Albizia lebbek</i>	Albiziya	05
	<i>Pterocarpus</i>	Madobiya	25
	<i>erinaceus Vitellaria</i>	Kadanya	23
	<i>paradoxa Syzygium</i>	Malmo	12
	<i>guineense</i>	Kiryu	30
	<i>Prosopis africana</i>	Aduwa	30
	<i>Balanites aegyptica</i>	Faru	25
	<i>Lannea microcarpa</i>	Madaci	15
	<i>Khaya senegalensis</i>	Marke	16
	<i>Anogeissus</i>	Maje/kadaura	28
	<i>leiocarpus</i>	Katsari	08
	<i>Daniellia oliveri</i>	Taura	04
	<i>Albizia chevalieri</i>	Dinya	30
	<i>Detarium</i>	Kanya	30
	<i>microcarpum</i>	Baure	19
	<i>Vitex doniana</i>	Danya	15
	<i>Diospyros</i>	Kawo	30
	<i>mesfilipromis</i>	Doka	29

	<i>Ficus sycomorus</i>	Dorawa	30
	<i>Sclerocarya birrea</i>	Rimi	30
	<i>Afzelia africana</i>		
	<i>Isoberlina doka</i>		
	<i>Parkia biglobosa</i>		
	<i>Ceiba pentandra</i>		
Usual growth stage of plant used	Young		00
	Matured		11
	Highly matured		19
How tress are acquired for the production	Trespass into forest reserves		11
	Buying from individuals or private (tree lot or wood lots)		05
			12
			02
	Community protected areas		
	Cultivated (planted)		

Source: Field Survey, 2022.

Table 3 presents results obtained about the responses of the majority of individuals on the production and trading of moderate sized (100 kg) Mortal and pistil unit. The results have indicated that from the highly matured tree, only 10 to 20 units are produced and each unit is traded at ₦5000 to ₦10000 Nigerian Naira. In the course of the production, it was observed that 30 to 50% of the plant biomass is wasted and the fate of the wastes is only to be used as fuel wood. The results further revealed that a respondent trades 10 to 30 units every month. Panayotou and Ashton (1992) revealed that the minimum individual conservation area for each habitat should be at least 5,000 and based on the assessment of ravage production and trading of mortal and pistil made from threatened plant species in the study area, the results demonstrate that plant production and trading in this region is significantly endangered due to a variety of environmental factors (Juniper, 2004). Without sufficient support and assistance from local authorities, these threats will continue to put the sustainability of the plant species at risk (Myers *et al.*, 2000; Juniper, 2004). The results of this assessment point to

the need for urgent attention and action to reduce ravage production and trading from these threatened plant species. In order to combat this risk, local authorities and the government must provide the necessary resources to support the local communities. This could include strengthening the enforcement of existing regulations, initiating campaigns to reduce social pressure on different species, or providing resources to combat environmental threats. Furthermore, greater collaboration between local producers and traders to ensure sustainability may help mitigate the effects of the ravage production and trading. It is clear that ravage production and trading of threatened plant species in the semi-arid region of Nigeria is a serious problem (Eze and Nwaiwu, 2012; Osawaru *et al.*, 2013). This assessment has highlighted the need for innovative solutions to safeguard these species from further destruction. With the right support and attention from local authorities and international partners, these threats can be addressed.



Table 3: Production and trading of average sized wooden mortal and pistil

Respondents n = 30 Attribute	Preference	Frequency (F)
Average production rate per plant	10 – 20	14
	21 – 30	09
	31 – 40	05
	41 – 50	01
	>50	01
Value (Nigerian Naira) per unit item	1000 - 5000	06
	5100 – 10,000	20
	>10,000	04
Number of unit sale per month	1 to 10	04
	11 to 20	10
	21 to 30	10
	> 30	06
Percentage waste during wood processing	1 - 10%	00
	11 - 30%	00
	31 - 50%	23
	51 - 70%	07
Uses of the waste materials by people	Disposed	05
	Used as energy	23
	Animals feed	01
	Others (specify)	01

Source: Field Survey, 2022.

CONCLUSION

In conclusion, this study has highlighted the production and trading of Mortal and Pistil made from threatened plant species in Nigeria. It has revealed that the production and trading of these tools is mainly done by men between the ages of 30 and 50 years old. The most preferred species used in the production of wooden mortal and pistil are *Ficus platyphylla*, *Faidherbia albida*, *Vitellaria paradoxa*, *Prosopis Africana*, *Balanites aegyptica*, *Lannea microcarpa*, *Daniellia oliveri*, *Vitex doniana*, *Diospyros mesfilipromis*, *Afzelia Africana*, *Isobertina*

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doka, *Parkia biglobosa* and *Ceiba pentandra*. The results also showed that the highly matured tree make 10 to 20 units with market value at ₦5000 to ₦10000 Nigerian Naira. Additionally, it was observed that 30 to 50 % of the plant biomass is wasted and the fate of the wastes is only to be used as fuel wood. Failure to protect and conserve these plant resources for our present and future's need negates the global consensus and agreements adopted under the United Nation Conference on Biodiversity Conservation.

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