DISAPPEARING SACRED GROVES: CAUSES AND IMPLICATIONS FOR BIODIVERSITY CONSERVATION IN TWO LOCAL GOVERNMENT AREAS OF ABIA STATE OF NIGERIA

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ABSTRACT

Sacred groves which were commonly seen in rural landscapes of the Ngwa people in Abia State, Nigeria are disappearing at an alarming rate, yet no studies have been carried out to uncover the reason(s). The study was conducted to ascertain the causes and reasons for the demolition of sacred groves in this area, the implications for biodiversity conservation, and to explore possible ways of re-introducing trees. About 97% of the grove sites covered in the study have been demolished. The demolished grove sites are now bearing arable farm (65.51%), fallow land covered with *Bambusa vulgaris* (17.24 %), fallow land with mixed plant species (13.39%), while 3.45% is now part of a local access road. The demolition of the groves started since 1989 with the highest percentage (48.28%) occurring in 2006. Factors responsible for the demolition of the groves include social reform (48.28%), Christian reform (37.93%), family decision (10.34%) and village decision (3.45%). These reforms and decisions were borne out of the belief that the groves harbor demonic spirits capable of causing diverse misfortunes or being used to impede people's progress. A total of 92.86% of the respondents were against the reconstitution of the sacred groves as a means of reintroducing trees in the area while 86.43% expressed willingness to integrate and manage fruit trees on their farms if provided with seedlings. Agroforestry is suggested as alternative means of reintroducing trees in the area.

KEY WORDS: Ngwa land, Sacred Groves, Causes of demolition, Biodiversity Conservation

INTRODUCTION

Sacred groves are patches of natural vegetation dedicated to local deities and protected by religious tenets and cultural traditions; they may also be anthropogenic tree stands raised in honour of heroes and warriors and maintained by the local community with religious favour (Ramanujam and Cyril, 2003). Sacred groves are multifaceted social institutions and symbolize the dynamic social forces linked with access and control over resources. They possess a great heritage of diverse gene pool of many forest species having socio-religious attachment and possessing medicinal values. Sacred groves are ecologically and genetically very important. They are the abodes of rare, endemic and endangered species of flora and fauna (Anthwal *et al*, 2006).

Due to the belief that trees are abode of gods, many communities set aside areas of forest, and establish rules and customs to ensure their protection. These rules vary from locality to locality, as well as, from grove to grove. Such rules ensure the protection of trees, herbs, shrubs, and animals. Punishment for individuals for violating the rules could be very strict. Shonil and Claudia (2006) have shown that communities around the world traditionally protect natural sites that are dedicated to ancestral spirits and deities. Thus, sacred groves harbour great genetic diversity. In modern times, they have become biodiversity hotspots, as various species seek refuge in them due to progressive habitat destruction, and hunting. In most cases, sacred groves often contain plant and animal species that have become extinct in neighbouring areas. These groves are important in conservation of genetic resources existing in the locality where they are found. In fact, traditional conservation practices are best reflected in natural forest pockets, the sacred groves. Such groves indicate the value of traditional ecological knowledge.

Sacred groves which were commonly seen in rural landscapes of Isiala Ngwa North and South Local Government Areas of Abia State, Nigeria, acted as refugia for displaced wildlife due anthropogenic activities like shifting agriculture and various land use practices. Indeed, groves in these areas were sacrosanct. However, casual observations now show that these groves which once served as biodiversity hotspots are fast disappearing; yet no study has been carried out to ascertain the causes, and suggest how plant and animal species which are equally disappearing with them can be re-introduced and managed in these rural landscapes. The study was a step in that direction.

MATERIALS AND METHODS
Description of the Study Area

The study was conducted in Isiala Ngwa North and Isiala Ngwa South Local Government Areas of Abia State, Nigeria. Abia State is one of the five States in the Southeast geopolitical zone of Nigeria. It lies between latitudes $04^o 45^1$ and $06^o 07^1$ north and longitudes $07^o 00^1$ and $08^o 10^1$ east. The state shares common boundaries to the north with Ebonyi and Enugu States; to the south and southwest with Rivers State; and to the east and southeast with Cross River and Akwa Ibom States respectively. To the west is Imo State and to the northwest is Anambara State. It covers a land mass of about 5, 833.77sq. km.

Abia State is located within the rainforest belt of Nigeria with a temperature range of between 20°C to 36°C. The total annual rainfall decreases from 2200mm in the south to 1900mm in the north. The relative humidity is usually high throughout the year, reaching a maximum during the rainy season when values above 90% are recorded.

Materials used for the Study

The materials used for the study include a Motorcycle, measuring tape, Geographical Positioning System (GPS) Receiver, and a field note.

Selection of Villages for the Study

Twenty villages were purposively chosen for the study. This followed a recommendation by 5 elderly persons interviewed in Umuojima-Efere Village – one of the villages within the study area, on where to find the groves, during a reconnaissance survey.

Method of Data Collection

With the recommendation of the Village Head, one male and one female within each of the following age classes: 20 – 40, 41 – 60 and 61 – 80, were selected for interview in each village. This gave rise to a total of 7 persons (the Village Head inclusive) interviewed in each village, and 140 persons in the 20 villages. Information sought bothered on : (1) the number of grove sites (whether demolished or not demolished) present in each village and their locations; (2) Reason(s) for setting up the grove; (3) plant species previously present in the demolished grove sites; (4) date of demolition for the demolished grove sites; (5) Reason(s)/cause(s) of demolition; (6) perceived impact(s) of demolition (positive/negative); and (7) people's views with respect to the reconstitution of the groves and the reasons for such views.

Plant species identification (100%) was done for the only grove that has not been demolished. This was done with the aid of keys provided by Keay (1989). Plant species (arable crops and others) now present in the demolished grove sites were also identified.

In each of the grove sites visited, the geographical coordinates were recorded using Geographical Positioning System (GPS) receiver and the area covered or previously covered by the grove measured. The boundaries of the demolished groves were identified by the Village Heads and the elders interviewed in various villages.

Method of Data Analysis

Data collected from the study were analysed using descriptive statistics and presented in tables and charts. Sorensen's similarity index (Pelou, 1969) was also used to ascertain the similarity or otherwise dissimilarity in plant species found and/or previously found in the groves and those of the land use/land cover types introduced after the demolition of the groves.

Sorensen's index is expressed as:

$$RI = 100 * a / a + b + c$$

Where:

a = number of species present in both sites under consideration

b = number of species present in Site 1 but absent in Site 2

c = number of species present in Site 2 but absent in Site 1

RESULTS

Locations and Status of the visited Groves

Table 1 shows the locations and status of the visited Grove sites while Figure 1 shows the percentage allocation of the demolished Grove sites to other land uses. The elevation of the sites ranges from 87 – 116 metres above sea level. About 97% of the sites have been demolished. The demolished grove sites are now bearing arable farm (65.51%), fallow land covered with *Bambusa vulgaris* (17.24 %), Fallow land with mixed plant species (13.39%), with 3.45% now part of a local access road. *Bambusa vulgaris* covers about 56% of the demolished grove sites lying fallow.

TABLE 1. Locations and status of the visited Grove Sites

S/N	Village	Geographical Coordinates	Elevation (m)	Status	Present Land Use
1.	Umuojima-Efere	05°18' 43''N 007°19'17''E	100	Demolished	Arable farm
2.	Umuojima-Efere	05°18'39''N 007°19'13''E	104	Demolished	Arable farm
3.	Umuojima-Efere	05°18'32''N 007°19'07''E	96	Not demolished	-
4.	Umuojima-Efere	05°18'32''N 007°18'53''E	87	Demolished	Arable farm
5.	Umuojima-Efere	05°18'40''N 007°19'31''E	98	Demolished	Arable farm
6.	Umuojima-Ukwu	05°18'26''N 007°19'06''E	89	Demolished	Arable farm
7.	Umuojima-Ukwu	05°18'27''N 007°19'01''E	95	Demolished	Arable farm
8.	Umuojima-Ukwu	05°18'23''N 007°18'49''E	88	Demolished	Arable farm
9.	Umuojima-Ukwu	05°18'12''N 007°19'30''E	89	Demolished	Arable farm
10.	Umuogwo	05°18'00''N 007°19'52''E	102	Demolished	Arable farm
11.	Umuogwo	05°18'00''N	102	Demolished	Fallow land with

		007°19'52''E			mixed plant species
12.	Amaogwugwu, Uratta	05°21'00''N 007°20'39''E	102	Demolished	Fallow land covered with *Bambusa vulgaris*
13.	Umuoleke, Uratta	05°20'53''N 007°21'19''E	-	Demolished	Fallow land covered with *Bambusa vulgaris*
14.	Umuoleke, Uratta	05°20'53''N 007°21'20''E	116	Demolished	Fallow land with mixed plant species
15.	Okpuala, Uratta	05°20'12''N 007°21'29''E	107	Demolished	Arable farm
16.	Uratta	05°20'12''N 007°20'58''E	104	Demolished	Arable farm
17.	Umuokpa, Uratta	05°19'52''N 007°20'58''E	104	Demolished	Fallow land covered with *Bambusa vulgaris*
18.	Amaekpu Isiahia	05°20'02''N 007°20'07''E	104	Demolished	Arable farm
19.	Amaekpu Isiahia	05°20'09''N 007°19'59''E	99	Demolished	Road
20.	Okpuala Amapu	05°19'53''N 007°19'48''E	101	Demolished	Arable farm
21.	Umuovo Amapu	05°19'48''N 007°19'41''E	101	Demolished	Fallow land covered with *Bambusa vulgaris*
22.	Okeala Amapu	05°19'35''N 007°19'40''E	108	Demolished	Fallow land covered with *Bambusa vulgaris*
23.	Umuorisa Amapu	05°19'33''N 007°20'06''E	105	Demolished	Arable farm
24.	Oba-Ekwesu	05°18'54''N 007°21'03''E	107	Demolished	Arable farm
25.	Oba-Ekwesu	05°18'57'N 007°20'13''E	109	Demolished	Arable farm
26.	Umuosala-Umuokwo	05°18'40''N 007°21'05''E	107	Demolished	Arable farm
27.	Umuosala	05°18'35''N 007°21'03''E	104	Demolished	Arable farm
28.	Umuezeoche	05°18'41''N 007°20'40''E	105	Demolished	Arable farm
29.	Umuacha	05°17'36''N 007°20'24''E	106	Demolished	Fallow land with mixed plant species
30.	Mgbedeala	05°17'36''N 007°20'50''E	100	Demolished	Fallow land with mixed plant species
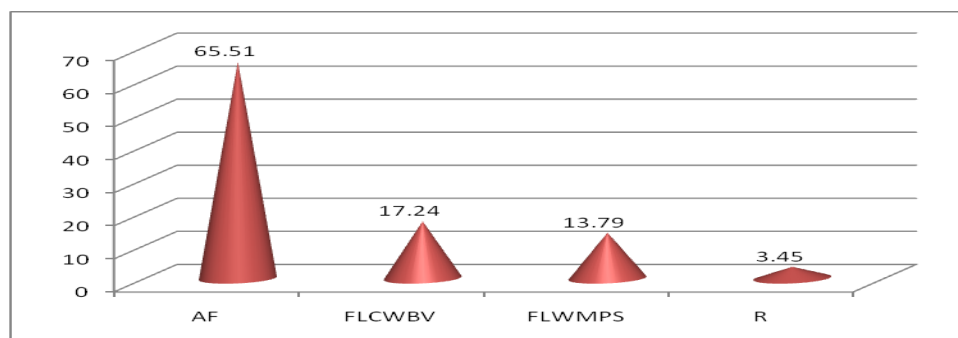
FIGURE 1: Percentage allocation of demolished Grove Sites to different land use types
AF = Arable farm; FLCWBV = Fallow land covered with *Bambusa vulgaris;*
FLCWMPS = Fallow land covered with mixed plant species; R = Road

Reasons for constituting the Groves and their sizes

The reasons for constituting the various groves and their sizes are presented in Table 2. The sizes of the groves range from 0.2 – 1.5 hectares. The groves served different purposes like traditional worship grounds, burial grounds, traditional court of arbitration, initiation ground for native doctors, ground for depositing excavated heads of dead witches and wizards, places of abode and converging ground for deities.

TABLE 2. Sizes and reasons for constituting the Groves

S/N*	Reason(s)	Size (Hectare)
1.	A place of abode for the village deity and a meeting place for spiritual activities	0.5
2.	A place for making sacrifices to appease the gods on behalf of dead witches and wizards, and for keeping the excavated heads of buried witches and wizards	0.2
3.	Traditional court of arbitration	0.2
4.	Initiation ground for native doctors and traditional worshippers	0.2
5.	Family traditional worship ground	0.5
6.	Traditional Court for Mbutu Amairinisii Community, and a meeting ground for traditional priests	1.0
7.	Burial ground for dead kids	1.5
8.	Burial ground for dead kids	1.5
9.	Traditional worship ground	0.5
10.	Traditional worship ground	0.5
11.	Traditional worship ground and burial ground for dead kids	1.0
12.	Traditional worship ground and burial ground for dead kids	1.0
13.	Traditional worship ground and burial ground for dead kids	1.0
14.	Family traditional worship ground	0.5
15.	Traditional worship ground, meeting ground for ancestral spirits and burial ground for dead kids	1.0
16.	Traditional worship ground	0.6
17.	Traditional worship ground and burial ground for dead kids	1.2
18.	A place for making sacrifices to appease the gods on behalf of dead witches and wizards, and for keeping the excavated heads of buried witches and wizards	0.6
19.	Traditional worship ground	0.3
20.	Burial ground for dead kids and a place for keeping excavated heads of dead witches and wizards	1.0
21.	Site for making sacrifices to the gods	0.5
22.	Traditional worship ground and meeting place for traditional priests	0.5
23.	A place for making sacrifices to appease the gods on behalf of dead witches and wizards, and for keeping the excavated heads of buried witches and wizards; meeting ground for traditional priests; and burial ground for dead priests	1.5
24.	Converging ground for the deities of the whole Mbutu Amairinisii Community	1.0
25.	Site for making sacrifices, and for depositing excavated heads of individuals dedicated to local gods at birth/witches and wizards	0.5
26.	Burial ground for dead kids, site for dumping twins in the olden days and for keeping excavated heads of dead witches and wizards	1.0
27.	Family traditional worship ground	0.4
28.	Family traditional worship ground	0.5
29.	Village traditional worship ground	0.5
30.	An abode for ancestral spirits	0.2

*Serial numbers follow the same order as in Table 1

Periods for the Demolition of the Groves

The years the groves were demolished are shown in Table 3. The years 1989, 1998, 1999 and 2005 had the least percentage demolition (3.45% each); followed by 2003 (6.90%); 2000, 2002 and 2004 (10.34% each); and 2006 (48.28%)

Factors responsible for the Demolition of the Groves

Factors responsible for the demolition of the groves are presented in Table 4. Social reform (48.28%) was the highest among the factors, followed by Christian reform (37.93%), family decision (10.34%) and village decision (3.45%).

Previous and present flora of the Grove Sites

Table 5 presents a checklist of plant species found and/or previously found in the groves and those found in the demolished grove sites, and their habits. Sorensen's Index (9.36%) shows a high level of dissimilarity in the previous and present flora of the grove sites.

TABLE 3. Number of demolitions for different years

Year	No.	%
1989	1	3.45
1998	1	3.45
1999	1	3.45
2000	3	10.34
2002	3	10.34
2003	2	6.90
2004	3	10.34
2005	1	3.45
2006	14	48.28
Total	29	100

TABLE 4. Number of demolitions for different causes/factors

Cause	No.	%
Christian Religious Reform	11	37.93
Social Reform	14	48.28
Family Decision	3	10.34
Village Decision	1	3.45
Total	29	100

TABLE 5. Previous and present plant species of the Grove Sites

Previous			Present		
Scientific name	Common name	Habit	Scientific name	Common name	Habit
Ceiba pentandra	Kapok tree	Tree	*Bambusa vulgaris*	Bamboo	Woody grass
Melicia excelsa	Iroko	Tree	*Carica papaya*	Pawpaw	
Entandrophragma cylindricum	Mahogany	Tree	*Zea mays*	Maize of Corn	Annual herb (grass)
Hevea brasiliensis	Hevea rubber	Tree	*Manihot esculenta*	Cassava	Shrub
Gnetum africanum	African salad	Climber	*Panicum maximum*	Guinea grass	Grass
Pentachlethra macrophylla	Oil bean tree	Tree	*Costus afer*	Bush cane	Herb
Newbouldia laevis	Boundary tree	Shrub/Tree	*Chromonaela odorata*	Siam weed	Annual weed
Bambusa vulgaris	Mamboo	Woody grass	*Elaeis guineensis*	Oil plam	Tree
Costus afer	Bush cane	Herb	*Musa paradisiaca*	Plantain	Perennial herb
Treculia africana	Bread fruit	Tree	*Ipomoea involucrata*	Morning glory weed	Climber
Dacroydes edulis	Pear	Tree	*Abelmoschus esculentus*	Okra	Herb
Elaeis guineensis	Oil palm	Tree	*Telfairia occidentalis*	Fluted Pumpkin	Climber
Pterocarpus osun	Camwood	Tree	*Discorea rotundata*	Yam	Climber
Gongronema latifolium	-------------	Woody climber	*Colocasia esculenta*	Cocoyam	Herb
Acanthus montanus	False thistle or Leopard's tongue	Decumbent herb	*Tridax procubens*	Coat buttons	Straggling annual herb
Crescenta cujete	Calabash tree	Tree	*Solanum sp.*	Garden egg	Annual herb
			Aspilia africana	Wild marigold	Herb
			Ficus exasparata	Sand paper tree	Shrub/tree
			Mimosa pudica	Sensitive plant or shame plant	Scrambling herb

- Sorensen's Similarity Index = 9.36%

Respondents' perceived Impacts of Demolition of Groves and preferred Ways of re-introducing Trees in the Study Area

Table 6 presents the respondents' perceived impacts of the demolition of the groves. The respondents prefer the integration of fruit trees in their farms to reconstituting the groves (Table 7).

TABLE 6. Perceived Impacts of Demolition of the Groves

Positive	Negative
Destruction of meeting grounds for witches and wizards	loss of flora
Liberation from the influence of evil spirits that inhabit the groves	loss of fauna
Removal of fear associated with the presence of the groves	Loss of burial grounds for dead kids
Availability of land for other uses especially farming	
Destruction of places of abode for demons	

TABLE 7. Respondents' preferred means of re-introducing trees

	Yes	%	No	%
Reconstitution of the groves	10	7.14	130	92.86
Willingness to integrate and manage fruit trees on farms if provided with seedlings	121	86.43	19	13.57

DISCUSSION

The primary motive behind the constitution of sacred groves in Ngwa land, like in most other parts of the world, is basically spiritual. However, these groves which doubled as biodiversity conservation areas have almost disappeared. Although the demolition of the groves started over 20 years ago, our results reveal that a greater percentage of them were demolished within the last decade. This was orchestrated by a social reform and a Christian reform pioneered by the youths and pastors in the area respectively, to get rid of 'demonic' spirits inhabiting the groves and which are believed to be responsible for their misfortunes.

About 66% of the demolished groves have been replaced by arable farms. This partly accounts for the high level of dissimilarity in plant species composition between the plant species currently inhabiting the demolished grove sites, and the ones previously found in them/those found in the only grove that is still intact. In addition, the demolition of the groves has triggered off the colonization of the sites by pioneer weed species. Although, plant diversity was not assessed in this study, sacred groves have been known to be rich in biodiversity. Ramanujam and Cyril (2003), recorded a total of 111 species, belonging to 103 genera in 53 families, from four sacred grove-sites, which together measure 15.6 ha. In a study conducted in the sacred grove of Lumbini to elucidate its potential role in biodiversity conservation in Nepal, Bhattarai and Baral (2008), recorded a total of 65 tree species with 39 of them being indigenous to Nepal. The authors equally observed that majority of the trees found in the grove were produced by plantation, noting that it has contributed to *ex-situ* conservation of trees. In a separate study in Tanzania, Mgumia and Oba (2003) observed that sacred groves had greater woody species richness and taxonomic diversity than the state managed Forest Reserve despite the fact that they occupied a relatively small area. Hence, the demolition of the groves has grave implications for biodiversity conservation. Habitat loss has been recognized as one of the factors driving loss of biological diversity and species extinction (IUCN, 2002).

Despite the fact that loss of biodiversity was identified by respondents as one of the negative impacts of the demolitions, one amazing thing is that the majority of the rural dwellers do not see the demolition of the groves especially the elimination of the trees as something to worry about. This is due to the belief that such trees and the groves harbor demonic and evil spirits which witch-hunt people and are capable of causing diverse misfortunes such as accidents, untimely death, obstruction and/or retardation of progress, failure in business, disunity, to mention but a few. They further argued that trees are not meant to be worshipped, and showed higher preference for planting new trees around their homes and farms than retaining the 'demonic' trees and groves. Their present stand could have been influenced by the Christian religious teachings as the demolitions occurred as a result of Christian reforms and social reforms/decisions that were not unconnected with doing away with little/inferior gods, which are perceived to be used in perpetrating evil. Since the retention of groves is linked or associated with the traditional religion which has been overwhelmed by Christianity, any attempts to reconstitute groves in the study area are likely going to be futile.

CONCLUSION

Groves which once served as biodiversity hotspots in the study area have almost disappeared. Christian reforms, social reforms and family/village decisions, arising from the belief that the groves harbor demonic spirits capable of causing or being used to cause various misfortunes, are chiefly responsible for the demolitions. Since the respondents expressed willingness to integrate and manage trees on their farms if encouraged, the introduction of agroforestry practice will be a viable means of reintroducing trees in the study area.

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