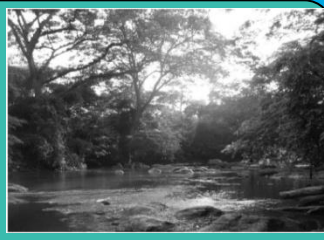# Role of traditional conservation method in *in-situ* biodiversity conservation in rainforest zone of south-western Nigeria

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Introduction

- ► Most forest conservation methods do not integrate the knowledge of local communities that have interacted with the forest ecosystem for centuries.
- ► Among the various forms of community participation in biodiversity conservation, sacred groves are the most popular and wide spread.
- ► Sacred groves occur in various forms such as: old forest remnants, sites for religious and cultural festivals, etc.
- ► Sacred groves are found in Africa, Asia, Europe, Australia and America but their methods of conservation vary based on their nature, distribution and local beliefs
- ► Though originally established for religious and cultural purposes, sacred groves have contributed greatly to *in-situ* biodiversity conservation such that today, they represent biodiversity hotspots
- ► Sacred groves present a higher concentration of floral diversity than managed forest ecosystems and are refuges for endangered species.
- ► Their importance as tools for biodiversity conservation is hinged on their distribution and roles as reservoirs of local biodiversity of threatened species.

Objective

Investigate the role of sacred grove in in-situ biodiversity conservation in rainforest zone of Nigeria. To accomplish this, biodiversity of sacred groves were compared with those of primary and degraded forest ecosystems.

## Methodology

The study sites

Two sacred groves, two primary and two degraded natural forest ecosystems were selected from the rainforest zone of south-western Nigeria.

Sacred grove	Primary forest	Degraded forest
Osun-Osogbo (75 ha)	Queen's forest (600 ha)	Akure/Ofosu (6,993 ha)
Igbo-Olodumare (7 ha)	Oluwa (primary part) (11,000 ha)	Oluwa (degraded part) (27,000 ha)

The following biodiversity indices were computed for each study ecosystem

Shannon–Wiener diversity index	Relative Diversity	Relative Dominance
Shannon's equitability index	maximum diversity index	

Selection of sample plots for data collection
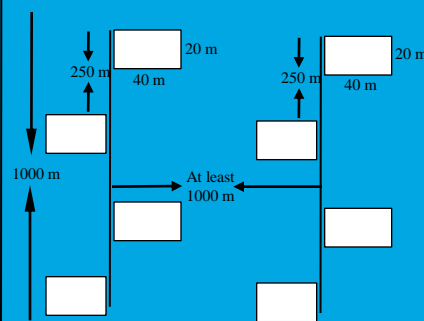
- All trees with dbh ≥ 10 cm were identified
- The dbh of all identified trees were measured
- A 5 m x 10 m quadrant was used for regeneration assessment
- All seedlings with dbh ≤ 10 cm were identified and their frequency recorded.

Results

Tree species with high relative dominance (RD) in descending order are:

S. G	Osun	*Holarrhena floribunda , Cola millenii ,& Celtis zenkeri*
	Igbo Olodumare	*Hildegardia barteri , Ricinodendron heudolotii & Bridelia micrantha*
D. F	Akure/Ofosu	*Cola gigantea, Cordia millenii & Ricinodendron heudolotii*
	Oluwa	*Ricinodendron heudelotii , Celtis zenkeri & Pterygota macrocarpa*
P. F	Queen's forest	*Mansonia altissima Celtis zenkeri & Triplochiton scleroxylon*
	Oluwa	*Diospyros spp, Strombosia pustulata & Celtis zenkeri*

Tree species that were dominant in most sites are:

- ► *Ricinodendron heudelotii,*
- ► *Celtis zenkeri,* and
- ► *Cola spp.*

Table 1: Summary of ANOVA results for tree parameters and biodiversity indices of the study sites

Biodiversity indices/ tree characteristics	Sacred Groves		Degraded forest		Primary forest	
	Osun-Osogbo	Igbo Olodumare	Akure/ Ofosu	Oluwa forest	Queen's forest	Oluwa forest
No. of Families	18[ab]	16[b]	21[ab]	18[ab]	23[a]	20[a]
No. of tree spp. (richness)	61[a]	29[c]	45[b]	31[c]	51[ab]	37[bc]
No. of seedling spp.	66	28	36	31	49	29
No. of endangered Spp[*]	20 (32.8)	8 (32.0)	13 (28.9)	9 (29.0)	17 (33.3)	8 (21.6)
Diversity index (H')	3.54[a]	2.35[b]	3.41[a]	3.10[a]	3.30[a]	3.16[a]
Species evenness (E_H)	0.66[a]	0.44[a]	0.65[a]	0.67[a]	0.59[a]	0.62[a]
Max. Diversity (H_{max})	5.40[a]	5.40[a]	5.23[ab]	4.62[c]	5.64[a]	5.09[bc]
Mean Dbh (cm)	31.2[ab]	26.2[ab]	29.5[ab]	21.7[b]	33.3[a]	25.2[ab]
Max. Dbh (cm)	154.4	105.0	130.4	90.4	140.0	110.2

Table 2: Reasons and belief systems that contributed to sacred groves preservation

Reasons	Osun-Osogbo %	Igbo Olodumare %
Tourism	10	10
Home of Deity/place of worship	5	45
Historical/Cultural importance	50	25
Nature Preservation	5	5
Education and Research	25	15
Total	*100*	*100*

Belief systems		
Place of important community festivals	5	15
Fear of Deity	50	10
Place of worship and healing	25	75
No idea	20	-
Total	*100*	*100*

Conclusion

Though sacred groves were established for spiritual purposes, they are playing important roles in in-situ biodiversity conservation. However, the traditional institutions that promoted biodiversity conservation in groves are crumbling. Given the changing culture, these belief systems may not be sustained. This must be addressed if groves are to continue playing important roles in conserving biodiversity. Future management of groves must remain in the hands of indigenous people. Tourism, revenue and employment will play important role in future preservation of groves and their biodiversity conservation potentials