COMMUNITY STRATEGIES FOR THE CONSERVATION AND PRESERVATION OF FOREST RESOURCES IN NSUKKA AGRICULTURAL ZONE OF NIGERIA

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ABSTRACT

The study identified the community strategies for conservation and preservation of forest resources in Nsukka agricultural zone of Nigeria. Nsukka agricultural zone is one of the three agricultural zones in Enugu state and is made up of six Local Government Areas (LGAs). A purposive sampling technique was used to select 48 respondents from two LGAs - Nsukka and Uzo-Uwani based on their involvement in community forestry management and the existence of abundant forest reserves and resources in the area. A semi structured questionnaire and focus group discussions were used to obtain information from the respondents. Descriptive statistics were employed in data analysis. Results showed that government forest reserves (52%) and communal forest reserves (41.1%) dominated the forest reserves in the area. The study also identified four major categories of forest resources available in the area. These included; timber products, non-timber products of plant origin, non-timber products of animal origin and recreation. The most effective community strategies adopted in the conservation and preservation of forest resources in the area were; restricting the harvest of forest resources by trespassers, prohibition of setting forests on fire, restricting farming in forest area and seizure of products from offenders. The study recommended adequate awareness campaigns by the state forestry commission in communities where forest resources exist in order to educate the people on innovative and sustainable forestry management measures.

Key words: Community, Strategies, Conservation, Preservation, Forest resources.

INTRODUCTION

A fundamental problem confronting mankind is how to meet its increasing demands without destroying its resource base (Agricultural and Rural Management Training Institute, ARMTI, 1997). Understanding how these resources are sustained is crucial for development. Forest resource represents a treasure in the open. This makes them vulnerable to various violations and disasters such as illegal cutting (poaching), fire, diseases, overgrazing, infrastructural development, etc. Forest – a community of trees, associated plants and animals (*Daramola et. al.*), is a form of economic capital passed on from generation to generation which is of immense value at local, national and international levels. It therefore becomes imperative for the management of this resource to be sustainable – satisfying the needs of the present without compromising the ability of future generations to meet their own needs from the forest.

With increases in the population of most developing societies like Nigeria, forest resources are continually subjected to enormous pressures bearing in mind that it plays significant roles in rural livelihood. The implication of this pressure and undue exploitation is that crucial plant and animal species in the forest face the danger of being extinct much faster than they would have been under natural conditions alone. At the global level, it is estimated that the speed of extinction is 2%-8% annually contrary to one specie per year obtainable before human life on earth (Zoest and Van, 1998). According to the International Union for the Conservation of Nature (IUCN) (1996), about 34% of fishes, 25% of mammals, 25% of amphibians, 20% of reptiles, and 11% of birds are under threat of extinction. The ratio of forest to people in the world showed that for every person in the world in 1996 there was 0.7ha of forest, however, projections for year 2025 show a decline to 0.46ha per person (Iremonger *et. al.* 1997). This represents a drop of 34%.

There is hardly any pocket of vegetation in Nigeria which has not been affected by man's activities through farming, logging, grazing, hunting, urbanization, road construction and other physical developments that lead to deforestation. It is saddening to note that apart from forest exploitations/ deforestations due to expanding and marginalized population in search of land and livelihood, some government policies sometimes encourage this menace. For example, the frequent and arbitrary increases in the prices of petroleum products have forced consumers to seek alternative sources of fuel (firewood) thereby destroying the forests. This single factor is common among the rural and semi-urban areas and contributes significantly to vegetation losses.

Also, forest destruction through overgrazing, over harvesting of timber and frequent bush burning hinder the system's ability to make use of solar energy leading to loss of production of plant biomass. Exploitation of forests has posed threats like acid rains and impure air. Introducing exotic forest species to replenish deforested ones not only distort the ecosystem but also may predispose the forest to dangers of pests and diseases. Even when reforestation programmes are embarked upon, the gap created by deforestation is never met. For instance, the early 80's were noted as having the highest rates of reforestation in Nigeria but evidence showed that only meager hectares of annual deforestation rate was reforested. Also, of the 50 African countries and territories included in a global forest conservation study, only 13 had more than 10% of their forests protected (Iremonger et. al. 1997).

Preservation and conservation of forests therefore will involve a well planned and judicious exploitation of the resource in such a way that will guarantee the continuous availability of the resource in its original form for future use. Forest resources are managed to provide not only wood and timber but also wilderness, fish, wildlife, water catchments as well as recreational facilities. According to Mastrantonio and Francis (1997), forests can restore watersheds and wildlife habitat, improve scenic beauty and opportunities for outdoor recreation, and produce wood and other products for local use and export. Many forest products contribute to the sustenance and income of local people: wildlife and fish, firewood, rubber, fruits and nuts, rattan, medicinal herbs, floral greenery, and charcoal. This shift of emphasis from a single resource to consideration of other relative values of the resource, gives the impetus for its preservation and conservation. Conservation is the sustainable use and management of natural resources including wildlife, water, air, and earth deposits, while preservation attempts to maintain in their present condition areas of the earth that are so far untouched by humans (Encyclopaedia of the Atmospheric Environment, 2000). These may be achieved through planting of mixed forest trees or recycling the resource; pest and disease controls; enforcement of laws against bush burning, overgrazing, pollution etc; controlled forest exploitation and the use of synthetic form of drugs other than medicinal plants.

Prior to modernization, the traditional institutions have successfully managed their forest resources to avoid dangers of exploitation by adopting several religious, traditional, social and economic practices. These practices and strategies create ecological balance which ensures rational use of plants and animals for food and other purposes. What these strategies are formed the major focus of this study.

The overall objective of the study was to ascertain the community strategies for preservation and conservation of forest resources in Nsukka agricultural zone. Specifically, the study was designed to: identify the types of forest reserves and resources existing in the study area; and ascertain the community strategies employed in the conservation and preservation of forest resources in the area.

METHODOLOGY

Nsukka agricultural zone is one of the three agricultural zones in Enugu state. It is made up of six local government areas (LGAs) namely: Nsukka, Igbo-Eze North, Igbo-Eze South, Isi Uzo, Udenu and Uzo Uwani Local Government Areas. Two out of the six LGAs were purposively selected for the study based on the existence of abundant forest reserves and resources in the areas. They included Nsukka and Uzo-Uwani LGAs. Also, two communities were purposively selected from each of the two LGAs for the same reason. They included Nsukka and Eha-Alumona for Nsukka LGA; Nkpologu and Adani for Uzo-Uwani LGA. Furthermore, 12 household heads from each community were purposively selected for the study based on their involvements in community forest managements. This gave a total of 48 respondents. However, valid responses were obtained only from 40 respondents and were subsequently used for data analysis.

Primary data were collected using a semi-structured interview schedule that was validated by experts in agriculture and forestry officials. In order to identify the types of forest reserves and resources existing in the area, a list of common types of forest reserves and resources obtained from literature and from experts was presented to the respondents for selection. The respondents equally had the opportunity of making their own inputs. Similarly, some

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strategies for preserving and conserving the forests were presented to the respondents to accept or reject and also make inclusions. Any strategy that scored up to 50% and above in the multiple response lists was regarded as an effective community strategy in the conservation and preservation of forest resources, while any strategy that scored less than 50% was regarded as an ineffective strategy. Also, focus group discussions were conducted for participants in each of the selected communities in order to obtain in-depth information on the study objectives. Data generated were analyzed using descriptive statistics such as frequency and percentage scores.

RESULTS AND DISCUSSION
Types of forest reserve
Results in Table 1 show that government forest reserves mostly (52.0%) existed in the area, followed by communal forests (41.1%) and then, sacred forests (6.9%). Government forest reserves are owned and controlled by officials of the forestry commission/ department in the area. They are demarcated by the forestry department for the purpose of developing forestry resources in the area. The higher percentage of government forest reserves was attributed to the low population density of the area during the entry periods of forestry projects which sought large expanse of land to establish the resource. Access to this forest reserve is restricted and can be granted only after obtaining permission from the forestry commission. Unfortunately, with population explosion, migration and development projects of the contemporary societies, such forest reserves have been severely tampered with.

Table 1: Percentage distribution of respondents according to the existing forest reserves in the study area (n= 40).

Types of Forest	Percentage Score
Communal forest	41.1
Sacred forest	6.9
Government reserve	52.0
Total	**100**

Source: Field data 2006

In the same vein, communal forests are the ones owned and controlled by community/ village/ kinship or family groups. Access is restricted to the individual community, village, and kinship or family groups. However, exploitation of resources is not controlled and this normally leads to over-exploitation of the forest reserve. On the other hand, sacred forests are the ones consecrated to deities in the area.

The sacred forests occupied the least area in the study area because most often, such forests provided small area of land for traditional religious worships. Reports from the focus group discussions revealed that access to sacred forests is severely restricted only to the chief priests and other worshippers as the case may be. Failure to adhere to this restriction may lead to harassments and even summary death. However, with the penetration of Christianity in the study area, these forests are gradually phasing out.

Types of forest resources
Results in Table 2 show the distributions of four main categories of forest resources in the study area. They included timber products, non-timber products of plant origin, non-timber products of animal origin and recreation. In the first category (timber products), results show that majority (54.6%) of the forest resources comprised gmelina *(Gmelina arborea)*. Others included silk cotton *(Ceiba pentandra)* (32.7%), bush butter tree *(Dacryodes edulis)* (32.0%), African nut-wood-oil *(Ricinodendron heudetotii)* (30.9%), obeche *(Triplochiton scleroxylon)* (28.3%), iroko *(Chlorophora excelsa)* (22.6%), akwa-mmiri *(Pycanthus amgolensis)* (20.8%), teak *(Tectona grandis)*, (13.4%) and Bamboo *(Oxytenanthera abyssinica)* (11.5%).

On the other hand, results on the non-timber products of plant origin showed that oil palms *(Eleais guinensis)* and cashew *(Anacardium occidentale)* accounted for 64.8% and 58.0% respectively, in the study area. Further results show that oil bean *(Pentaclethra macrophylla)* constituted 32.6%, medicinal herbs (27.9%), oha *(Pterocarpus spp)* (25.6%), okazi *(Gnetum africanum)* (23.7%), utazi *(Gongronema latifolia* Benth) (21.4%), uziza *(Piper guineense)* (20.1%) and mushroom *(Pleurotus spp)* (17.5%).

Similar results on the non-timber products of animal origin show that majority (55.5%) of the resource available in the area was grass cutter. The table further shows that honey constituted 43.4%, rabbit (40.8%), guinea fowl (38.7%), hare (35.6%), snails (32.5%), antelope (15.8%), monkeys (7.9%), chimpanzees (1.6%), Lion/ Leopard (0.00%) and elephants (0.00%). Other animals like rats, squirrels and snakes, etc constituted 22.1% of the available forest resource in the study area.

Further results show that the percentage distribution of parks in the study area was only three. This provided the only recreation resource in the area.

Table 2: Major types of forest resource available in the area (n= 40).

Forest Resources	Percentage Scores*
Timber Products	
Iroko tree (*Chlorophora excelsa*)	22.6
Obeche[+] (*Triplochiton scleroxylon*)	28.3
Bush butter tree (*Dacryodes edulis*)	32.0
Gmelina (*Gmelina arborea*)	54.6
Silk cotton (*Ceiba pentandra*)	32.7
Akwa-Mmiri[+] (*Pycanthus amgolensis*)	20.8
African nut-wood-oil (*Ricinodendron heudetotii*)	30.9
Teak (*Tectona grandis*)	13.4
Bamboo (*Oxytenanthera abyssinica*)	11.5
Non-timber product of plant origin	
Uziza[+] (*Piper guineense*)	20.1
Utazi[+] (*Gongronema latifolia* Benth)	21.4
Okazi[+] (*Gnetum africanum*)	23.7
Oilpalms (*Eleais guinensis*)	64.8
Cashew (*Anacardium occidentale*)	58.0
Oha[+] (*Pterocarpus spp*)	25.6
Mushroom (*Pleurotus spp*)	17.5
Oil bean (*Pentaclethra macrophylla*)	32.6
Medicinal herbs	27.9
Non-timber products of animal origin	
Guinea fowl	38.7
Antelope	15.8
Grass cutter	55.5
Rabbit	40.8
Hare	35.6
Honey	43.4
Snails	32.5
Monkeys	9.9
Chimpanzees	1.6
Lion/ Leopard	0.0
Elephants	0.0
Others (e.g. Squirrels, Rats, Snakes, etc)	22.1
Recreation	
Parks	3.0

Multiple responses [+] Local names
Source: Field data 2006

From Table 2, it could be observed that timber products had been extensively exploited in the area which made their availability to be meager. This is contrary to what was obtainable in the past years when forest exploitations were not severe. This situation could be attributed to various infrastructural developments taking place in the area. Such developments could be seen in the area of road construction, housing projects, industrial layouts, market developments, domestic fuel supply and logging for exports. According to Daramola *et. al.* (2002), human activities such as uncontrolled tree felling, oil exploration, exploration for fuelwood, housing and industrial pollution (e.g. acid rain) contribute significantly to the destruction of forests. Even where some of these resources – plant and animal existed, it was found that they were at immature states meaning that they were not allowed to fully mature before they were harvested.

High population density might have also indirectly contributed to this decrease in timber products. The implication of continued exploitation of the resource is that they might eventually lead to the erosion of the genetic resource or summary extinction. This therefore calls for governments and communities to expedite action and arrest the ugly situation by reversing the trend through a forestation, preservation and conservation programmes. Same goes to the non-timber products of plant and animal origins.

It was not surprising to find out that big animals like lions/ tigers, elephants and chimpanzees were already out of existence in the area. Such animals must have been killed by hunters or chased away into the far away bushes as a result of deforestation. Mastrantonio and Francis (1997) observed that the worldwide loss of tropical forests has led to thousands of species of birds and animals being threatened with extinction, a list which includes many unique and fascinating animals.

The use of forests for the provision of outdoor recreations could be seen in some communities, states or national parks as one dominant role that forests play. The value of these parks is prominent in communities during festivals, meetings and other ceremonies which attract many people (indigenes and strangers) to the communities. Most often, the parks provided by forests serve as avenues for ecotourists who pay to experience nature at work. A typical example is the famous 14,500 km^2 Serengeti National park in Tanzania that has long been protected and managed for wildlife and other natural resources (Mastrantonio and Francis, 1997). This way, a community or government can earn foreign exchange or increase their economic base.

Community strategies for conservation and preservation of forest resources.

Results in Table 3 show that out of the 11 strategies investigated, six were effective in the conservation and preservation of forest resources, while five were ineffective. The most effective (80%) community strategy identified by the respondents was restricting the harvest of forest resources by trespassers. Other community strategies identified by the respondents as being effective in the conservation and preservation of forest resources included; prohibition of setting of fire in forests (78%), restricted farming in forest areas (75%), seizure of products from

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offenders (60%), the practice of shifting cultivation technique (56%) and punishments to forest offenders through payment of fines (52%).

On the other hand, the most ineffective (5%) community strategy identified by respondents was the ostracizing of forest offenders by the community. Other ineffective community strategies include; replanting of forest trees (6%), fencing of the forest areas (8%), traditional appeasement of gods of sacred forests by offenders (15%) and the use of law enforcement agents against forest offenders (40%).

Table 3 Community strategies for conservation and preservation of forest resources.

Conservation and preservation strategies	%	Comment
Prohibition of Setting of fire in forests	78*	Effective strategy
Restricted harvesting of forest resources	80	Effective strategy
Restricted farming in forest areas	75	Effective strategy
Punishments to forest offenders through payment of fines	52	Effective strategy
Seizure of products from offenders	60	Effective strategy
Shifting cultivation technique	56	Effective strategy
Use of law enforcement agents against forest offenders	40	Ineffective strategy
Traditional appeasement of gods of sacred forests by offenders	15	Ineffective strategy
Fencing of the forest areas	8	Ineffective strategy
Replanting of forest trees	6	Ineffective strategy
Ostracizing forest offenders	5	Ineffective strategy

Multiple responses
Source: Field data, 2006

Restricting the harvesting of forest resources was found to be the most effective community strategy for conservation and preservation because the practice retains the natural value of the forests and keeps its fauna and flora intact. However, some respondents noted that they usually do selective harvesting in the forests on special periods or occasions under strict obedience to the community laws and guidelines. This method has been found useful because it not only satisfies the needs of the citizens by providing the necessary resources but also preserves the forests and prevents certain species from being extinct due to over-exploitation. On the other hand, where anybody harvests the resources from forests illegally, such items are bound to be seized albeit other punishments that will follow subsequently.

Also, many communities have preserved and conserved their forest resources by proscribing the setting of fire in their forests. Culprits were usually fined heavily or made to face other severe punishments in the community. As a result, community members take special precaution not to set fire in the forests thereby preserving its resources.

Again, one of the greatest threats to forests is man's activities in terms of agricultural activities. According to Mastrantonio and Francis (1997), conversion from shifting cultivation to sedentary agriculture is an even greater threat to tropical forests. This is sequel to the geometric increases in human populations which has shortened the fallow period between cycles of farming. Vast areas that once supported tropical forests are now permanently occupied by subsistence farmers and ranchers and by commercial farmers who produce crops, animals, fisheries, pastures, etc. In order to reap bountiful harvests, man has always preferred to farm in virgin lands because of the presence of abundant dead organic matter/ manure. This has continuously led to the clearing of virgin forests thereby devastating the resources. In the study area, it was discovered that communities restrict farming activities to some areas but prevent farm work in some other areas so as to help preserve what nature has provided in those areas. This has undoubtedly helped in the preservation and conservation of forest resources in these areas.

Another effective strategy used by the communities in the preservation and conservation of their forest resources was the practice of shifting cultivation. Respondents noted that some communities once in a while maps out a particular location to be allowed to regenerate and grow into a forest mostly on communal lands. This happens when man's activities in the areas are about to lead to natural disasters like gully erosions or threat of desertification. During the said periods, no one is allowed to farm or cut down any tree in such areas and through this, the land is allowed to regenerate.

It is interesting to note that this study revealed that people hardly replanted any forest unless strictly for economic reasons. Even where an area is mapped out for regeneration, respondents noted that they do not usually go to plant the trees that will emerge therein, rather, the area is allowed to naturally regenerate itself.

CONCLUSION AND RECOMMENDATIONS

The study identified community strategies for conservation and preservation of forest resources in Nsukka agricultural zone of Nigeria. It showed that both government forest reserves and communal forest reserves mostly existed in the study area. The four main categories of forest resources available in the area included timber products, non-timber products of plant origin, non-timber products of animal origin and recreation. It was discovered that timber products and non-timber products of animal origin were the most devastated resources in the study area. This was attributed to the economic gains attached to the resources. Respondents noted that the effective strategies for conservation and preservation of forest resources in their area were by restricting the harvest of forest resources by trespassers, prohibition of setting forests on fire, restricted farming in forest areas and seizure of products from offenders. Others were the practice of shifting cultivation technique and punishments to forest offenders through payment of fines. On the other hand, respondents considered ineffective ostracizing forest offenders, replanting of forest trees, fencing of the forest areas, traditional appeasement of gods of sacred forests by offenders and use of law enforcement agents against forest offenders as strategies for conservation and preservation of forest resources in the area.

The study recommends that adequate awareness campaigns should be organized by the state forestry commission in communities where forest resources exist to educate the people on innovative and sustainable forestry management measures. Similarly, people should be encouraged to plant trees even when it does not have any immediate economic benefits and should be made to understand the ecological importance of such a practice. Also, stricter penalties should be meted out to any forest offender who poaches or farms indiscriminately on any forest reserve Such penalty also should go to any person who sets the resources on fire. Finally, every timber company must be officially registered and licensed before operation. Their activities must also be closely monitored by the respective forestry commission in the states to ensure sustained and regulated exploitation.

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