



The Contribution of Non-Wood Forest Products (NWFPs) to Livelihood Generation in Eriti Community Forest Wetlands, Ogun State, Nigeria.

¹ADEKUNLE, M.F, ²OLORUNTOBA, A., ^{1*}AJIBOLA, A.A and ¹AGBAJE, B.M.

¹Department of Forestry and Wildlife Management, University of Agriculture, Abeokuta, Nigeria.

²Department of Agricultural Extension and Rural Development, University of Agriculture, Abeokuta, Nigeria.

* Corresponding author: ajiforsure@yahoo.co.uk

Abstract

An ethnobotanical study of non-wood forest products (NWFPs) extraction in Eriti Community Forest Wetlands was carried out. This was with the aim of providing an additional baseline data for policy makers on the need for the conservation and proper management of forest wetlands areas. Respondents (400) drawn from 8 fringe villages of the Eriti Forest Wetlands provided the data for this study. The methods adopted were group discussions, participant observations and interpersonal interviews using pretested and structured questionnaire. The data analyses were mainly descriptive using percentages, mean, mode and frequency distribution tools. The results showed that the respondents were highly dependent on the extraction of NWFPs for livelihood generation especially at the subsistence level. The NWFPs include medicinal products, edible leaves and fruits, wrapping leaves, mushrooms, wild-animal products, snails, palm wine and chewing sticks. The extraction of these products were gender biased as majority of the respondents were males (75%) and married (97%) indicating that the extraction of these products can be integrated into the family lines. Negative impacts of NWFPs extraction on the wetland ecosystem was observed because of the destructive systems of harvesting. Suggestions were made for appropriate management policies to be put in place for the protection of the wetland ecosystems for environmental sustainability.

Key words: Non-wood forest products, Wetlands, Ecosystem, Conservation.

Introduction

Wetlands are considered to be the most biologically diverse of all ecosystems whose formation has been dominated by water, and whose processes and characteristics are largely controlled by water. More so, wetland is a place that has been wet enough for a long time to develop specially adapted vegetation and other organisms. Wetlands are amongst the earth's most productive ecosystems. They have been described both as "the kidneys of the landscape", because of the functions they perform in the hydrological and chemical cycles, and as "biological supermarkets" because of the extensive food webs and rich biodiversity they support (Barbier *et al*, 1997).

There are more than 50 definitions of wetland. The Ramsar's definition is the broadest and the most widely used. It is stated in the Ramsar Convention (Article 1.1), wetlands can be defined as:

"areas of marsh, fen, peat land or water, whether natural or artificial, permanent or temporary, with water that is static or flowing fresh, brackish or salt, including areas of marine water the depth of which at low tide does not exceed six meters" (Ramsar, 1997).

Simply put, a wetland is a land that is seasonally or permanently covered by shallow water, as well as land where the table water is close to or at the surface. These unique areas represent a combination of terrestrial and aquatic characteristics, and are further categorized by type as marsh, swamp, fen and bog. In wetlands areas, water is the primary factor controlling the environment and the associated plant and animal lives. They occur where the water table is at or near the surface of the land, or where the land is covered by shallow water. Delineation of water is mainly dependent on plants which are typically adapted to saturated soils (Dugan, 1992).

Nigeria, as per the above definition, is endowed with much great diversity of wetland ecosystems (lakes, swamps, flood plain, natural or artificial ponds, high mountain lakes and micro dams) as a result of formation of diverse landscape subjected to tectonic movements, a continuous process of erosion and human activities. During the Ramsar convention on wetlands, listed below are some of the recommended types or examples of wetlands. They are: Swamp, Freshwater swamp forest, Slough, Marsh, Flooded grass and savannas, Salt marsh, constructed wetland, Bog, riparian and Peat swamp forest. The

economic benefits of wetland have been cited in literatures. This could be as a result of its richness in biodiversity of plant and animals. In spite of these benefits associated with forest wetlands, especially Timber and Non-Wood Forest Products for livelihood, timber products are given more attention to the detriments of NWFPs. Hence, the relevance of this study.

Forestry is a productive sector with significant effects on meeting national socio-economic and environmental functions as well as the improvement of rural livelihoods. The important roles played by Non-Wood Forest Products (NWFPs) in the livelihood of rural and urban households cannot be overemphasized as majority of rural households in developing countries, and a large proportion of urban households depend on these products to meet some part of their nutritional, health, house construction, or other needs. A large number of households also generate some of their income from trades in forest products e.g. sales of *Irvingia* seeds in Ibadan (Uke, 2010). Non-wood forest products (NWFPs) in particular have been widely advocated by conservation and development organizations as potential alternative livelihood strategies, particularly in the wetland area communities because of their multi-benefits.

The importance of NWFPs at the national level lies in the huge numbers of people involved in gathering, hunting, processing, trading and other aspects of their production and use. As noted earlier, most rural people use some forest products, and many obtain part of their income from forest-product activities. Inadequacy of information and data about the rural and urban peoples' dependent on NWFPs from wetlands is a bane to any meaningful development and management of these resources. This study therefore provides an additional baseline data on the significant supports provided by wetlands in adding values to the lives of the rural dwellers in the forest wetland areas through the exploitation of NWFPs. This information is necessary for policy makers on the need for the conservation and a proper management of wetlands in forest areas in line with "Ramser 1997 Convention on Wetland Conservation."

The Study Area

The Eriti forest wetlands is situated in Obafemi/ Owode Local Government Area of

Ogun State in the humid tropical rainforest zone between latitudes 6°50'N and 7°50'N and longitudes 3.18°E and 3.32°E. It is about 20 kilometers on the southern part of Abeokuta, Ogun State capital. It shares boundary with Ewekoro / Ifo Local Governments areas in the west and it covers an estimated area of 156 km².

The population of Eriti Forest Wetlands Community is over 6,000 people and the two major ecosystems are Eriti Forest and banks of Ogun River. The wetland possesses rich alluvial soil useful in farming as a result of seasonal inundation and overflow of the river during raining season. The fringe communities are well dispersed in settlements and villages. Eriti village appears to be the largest among the villages in the intervention area with a population of about 2,000 people and it is within a walking distance on foot paths to the forest. The least populated village (Saare) is about 100 people in population. The other fringe villages in and around the intervention area include: Isiba, Ogunpa, Ajegunle, Oluwo Oke, Itori and Arowa.

Being an agrarian community, the villagers have utilized these forest wetlands to their best advantage, over the years, particularly in farming and other livelihood activities such as fishing, fuel wood collection, grazing of animals, hunting, logging and soil excavation for building and other construction activities.

Method of Data Collection

Sampling Techniques and Sample Size

A multistage random sampling approach was adopted to select a total of 400 respondents from the 8 randomly selected fringe villages in Eriti community forest wetlands areas. Combination of random and purposive sampling methods were used to identify the respondents for data collection.

In each of the selected villages, 50 respondents were randomly selected for the purpose of uniformity. The snow ball non-probabilistic techniques' following Mcall and Simmons (1969) and Adekunle (2005) was adopted. The villages selected include; Eriti, Isiba, Ogunpa, Arowa, Ajegunle, Itori, Oluwo Oke, Saare.

Data Collection

The major instrument of data collection was a structured and pretested questionnaire. The questionnaire was 400 in number and were administered to the respondents interpersonally. The questionnaire

interviews were complimented with participant observations and group discussions.

The interview schedules were conducted in respondents' homes and sometimes in open places especially in the evening and on Sundays when the respondents would be at home and less busy.

Data Analysis

Data gathered from interviews were encoded in the Microsoft Excel Program and processed using statistical package for the social sciences (SPSS). The variables analyzed included age, gender, occupation, education and religion. The data on species prioritization were analyzed following Adeola (1995) and Frenzel (1996). Descriptive statistical tools such as percentages, and frequencies were used to summarize the variables of interest. The results of the analysis are presented in form of tables.

Results and Discussion

Socio-economic characteristics of the respondents

The age of the respondents ranged from 20 to 60 years and above. Those in the age group of 31 –40 years accounted for about 29%, followed by those in the age group of 31 – 50 representing about 27%. This finding showed that all together a large proportion (80%) of the respondents are in the active and productive age group (Table 1). A large proportion of active age group in the society may lead to over exploitation of natural resources like the forests. The absence of the youths under the age of 20 years could be because they are either in the cities attending schools or learning trades (Table 1).

The male respondents were in the majority representing about 75% of the total sample while the female respondents were 25%. Majority of the respondents (97%) were married while the remaining are single (3%) (Table 1). Those classified as single include the divorcees, widows and widowers. Monogamy was prominent among the dwellers with an average of six people in each household. As majority of the dwellers are married, there is the likelihood of the integration of economic activities especially forest resources exploitation into the family line. This findings has some conservation implications because a large percentage of males who are married with a large family to cater for might lead a

constant and unsustainable exploitation of the wetland resources survival.

Farming is the major occupation and subsequently the major land use type with 99% of the respondents involved. Vegetable farming especially *Cochorus olitorus* (Ewedu) cultivation was the most prominent and observed as the major cash earning enterprise. The farmlands sizes ranged from 0.04ha to 1.0ha. Other arable farm crops cultivated include cassava, rice, maize, yams and garden eggs, most of which are for domestic consumption. These arable crops are usually planted as inter crops. The major perennial cash crops include cocoa, kolanut and oil palm trees. Contract labour and seasonal fishing enterprises were also other sources of generating income. In larger settlements such as Eriti there were non-farming occupations such as petty trading in homesteads selling wares like cigarettes, toiletries, bread, biscuits, alcohols and mineral water.

Hunting is mainly done on part time bases by most hunters at least twice in a week. The strategy employed is usually an individual approach. Most of the respondents have specific areas for hunting while others search for animals all around especially those hunting for snails. The strategies and technologies adopted include setting of wire and gin traps especially where the animals are crop pests and the use of Dane guns.

About 54% of the respondents had formal education ranging from primary to tertiary levels while 46% of the respondents had no formal education but are socially enlightened. However, primary school leavers were in the majority among those with formal education.

Religious activities were common, especially the Christian and Muslim religions. About 66% were Christians and the Muslims were 34% of the total. This trend could be because Christianity and Islam are the two prominent religions in Ogun State. More so, Abeokuta happens to be the cradle of Christianity in Nigeria, hence the predominance of Christians (Table 1).

Land Use Practices

The major type of land use is farming involving arable crops like leaf vegetables, pepper, garden egg and tomato. Other arable crops include maize, cassava and rice. Fishing and hunting were also practiced to generate

off season incomes. Nomadic cattle rearing were also observed because of the presence of grasslands in the intervention area.

Dependence of Forest for Livelihood

The rural economy is highly dependent on forest resources to generate income and to provide food and medicines. This assertion is reflected in this study among the dwellers. Table 2 below shows some of the forest products and the levels of dependency on them.

It can be observed from the table that the respondents depended highly on items such as medicinal products, stones and gravel, edible leaves, wrapping leaves and aquatic animals especially fish. The high dependence on stones and gravels, edible leaves, wrapping leaves and fishes could be attributed to their being major sources of income for the rural

dwellers in the community forest wetlands. The proximity of the area to Lagos and Abeokuta provides an easy market for these products. The high level of dependency on traditional systems of medicine using forest plants could be due to the poor access to orthodox systems of medicine and inadequate medical personnel as previously reported in Adekunle, (2005).

The extraction of all these products had some negative effects on the forest wetland ecosystem. For instance removal of sand, and gravels, from the wetlands and the systems of harvesting of medicinal products, edible and wrapping leaves always predispose the forest wetlands to various levels of threat. In most cases the system of harvesting is destructive and unsustainable.

Table 1. Socio-economic characteristics of the respondents

	Frequency	Percentage (%)	Mode
Age Class			
20 – 30	92	23	
31 – 40	114	28.5	31-40
41 –50	106	27.5	
51 – 60	50	12.5	
61 ⁺	48	12	
Total	400	100	
Gender			
Male	298	75	Male
Female	102	25	
Total	400	100	
Marital Status			
Married	386	97	Married
Single	14	3	
Total	400	100	
Occupation			
Farming	392	98	Farming
Hunting	5	1.25	
Civil service	-	-	
Trading	2	0.5	
Artisan	-	-	
others (Food Vendor)	1	0.25	
Total	400	100	
Educational status			
Primary School	164	41	
Secondary school	44	11	
Tertiary school	8	2	
No Formal Education	184	46	No formal Education
Total	400	100	
Religion			
Christianity	262	65.5	Christianity
Islam	132	33	
Traditional	6	1.5	
Total	400	100	

Table 2: Non-wood Forest Products, Dependency and Impacts.

Forest Products	Levels of dependency	Impact on the forest
Medicinal products	High	Negative
Geological materials, stones, gravels	High	Negative
Edible leaves (cultivated and wild)	High	Negative
Wild animals products	Low	Negative
Edible fruits (wild and cultivated)	Low	Negative
Wrapping leaves	High	Negative
Mushrooms	Low	Negative
Snail	Low	Negative
Aquatic fish	High	Negative
Religious activities	Low	Negative

Prioritization of the Non Timber Forest Products (NWFPs) by the communities

Based on the responses of the recorded, the different NWFPs exploited in the area were listed for prioritization. The basis for selecting the NWFPs for prioritization was the frequency of mention. Percent mention has been described as the strongest criteria for selection and ranking of multipurpose species. Adeola (1995) asserted that percent mention gives an insight into the acceptability of multipurpose species from which NWFPs are sourced by farmers. In order to meet an objective basis for ranking, the NWFPs were subjected to systematized criteria rating test based on some criteria. They include species availability, ease of processing, growth characteristics, harvesting and market potentials. Arising from these, a summary of the NWFPs exploited in the study area in order of priority are shown in Table 3 while plant species from which the NWFPs are extracted are also shown in Table 4. In Table 3, edible and wrapping leaves as well as edible fruits had the first and equal priority ratings followed by

medicinal herbal products. The implication is that these items could become extinct due to over exploitation especially where the respondents depended more on the wild sources. The medicinal herbal products were next in order of priority. This trend also has some conservation implications on the wild plant resources of the wetlands as the use of plants for traditional healthcare is age long and predates the modern systems of medicare (Adekunle,2005).

Table 3: List of NWFPs exploited by the respondents in order of priority

Items	Frequency of Mention	Ranks
Edible leaves	400	1
Wrapping leaves	400	1
Edible fruits	400	1
Medicinal products	398	4
Geological materials	300	5
Palm wine	240	6
Mushroom	200	7
Honey	140	8

Table 4: List of NWFPs and the plants from which they are extracted.

Local Names	Scientific Names	Status of Domestication	Level of Dependency
<u>Edible leaves</u>			
Ebolo	<i>Chrysocephun reubens</i>	Wild	Low
Eforoko	<i>Telfararia accidentale</i>	Domesticated	Low
Ewuro	<i>Vernonia amygdalina</i>	Wild and domesticated	High
Gbure	<i>Talinum triangulae</i>	Wild	High
Ewedu	<i>Cochorus olitorus</i>	Domesticated	High
Tete	<i>Amaranthus spp</i>	Domesticated	High
Soko	<i>Celosia argentine</i>	Domesticated	High
<u>Wrapping leaves</u>			
Eweran	<i>Thanmatococus Danielle</i>	Wild	High
Teak	<i>Tectona grandis</i>	Domessticated	High
<u>Edible fruits</u>			
Agbalumo	<i>Chrysophyllum albidum</i>	Wild	Low
Iyeye	<i>Spondias mombin</i>	Wild	Low
Oro/Apon	<i>Anitiaris toxicaria</i>	Wild	Low

Mango	<i>Mangifera indica</i>	Domesticated	Low
Guava	<i>Psidium guajava</i>	Domesticated	Low

Attitudes of the respondents towards participating in forest wetland management

The attitudes and dispositions of the respondents towards the suggested mode of managing forest wetlands for sustainable use are summarized in Table 5. It could be observed from the table that all respondents showed interest in more than one mode of participation in wetland management. A high level of willingness to participate in management of the forest wetlands is an indication that the forest wetlands were highly valued for its direct and indirect uses, and hence they are interested in its continued existence. It could also be because most of these products are becoming scarce as they may need to travel long distances in the wild to fetch them. Even some were ready to take part and be involved in all the suggested options of participation. These observations should be harnessed for the sustainable management of the forest wetlands.

Table 5: Distribution of respondents' dispositions in the management of the wetlands

Mode of participation	Freq.	%
Forest management communities	364	20
Community Development Association	384	21
Monetary contributions	378	20
Planting of trees	382	21
Protection activities	344	18
Total	1862	100

Conclusion

The findings in this study indicated that beyond timber, Eriti forest wetlands offer other products which are of economic benefits. Hence, wetlands can no longer be referred to as wastelands but viable resources in their own rights. The contribution of NWFPs extraction in Eriti forest wetlands to the respondents' wellbeing has also been recognized. However, as the respondent depended highly on the wild for the NWFPs, the negative impacts of the community on the ecosystem and the integrity of the forest wetlands cannot be over overlooked and have some implications on the wetlands ecosystems. For instance as farming is the predominant occupation, a large portion of lands will have to be cleared for

cultivation every year. A large farming population could mean a high level of forest resources degradation as similarly observed in Adekunle (1998). Osemeobo (1988) described small holder farmers as shifting cultivators and hunters. Shifting cultivation without adequate years of fallow could result in the loss of forest biodiversity. In the same vein the collection and harvesting of NWFPs products are not sustainable and always result in waste as more than needed are always collected with the erroneous believe that nature would replenish itself. As observed in this study, water pollution constitutes a menace to the integrity of the wetlands to support fish. The use of fire for hunting was common especially during the dry season and this may further aid biodiversity erosion in the forest wetlands. Conclusively therefore, if the forest wetlands are to continue to perform their roles in contributing to the wellbeing of the community, adequate policies should be put in place for their sustainable management. In this wise participatory forest management involving the rural dwellers is highly advocated. Enrichment plantings with desirable forest plant species should be stepped up in the area, Ogun state and by implication Nigeria should be a party to the Ramsar Convention on Wetlands conservation and management.

References

- Adekunle, M. F. (1998). Survey of Non-Timber Forest Products (NTFPs) and their uses in Ogun State: Nigeria a case study of Omo forest reserve. MF thesis, Dept of forestry and Wildlife Management, University of Agriculture, Abeokuta, Nigeria (Unpublished) 198p.
- Adekunle, M. F. (2005). Economics valuation of forest plant used in traditional treatment of guinea worm in Ogun State, Nigeria. Ph.D thesis, Dept of Forestry and Wildlife Management., University of Agriculture, Abeokuta, Nigeria. (Unpublished) 198p.
- Adeola, A. O. (1995). The process of Multi-purpose tree prioritization for agroforestry research. In: Oduwaiye, E. A. (ed) Proceedings of Forestry Association of Nigeria (FAN) Conference.; Nov. 1995. 235 – 246.
- Barbier, B., Acreman, M and Knowler ,D (1997) Economic valuation of wetlands: A guide or policy makers and planners. Ramsar Convention Bureau ,Gland,Switzerland 138p

- Dugan, P. J., (1992). Wetlands management: A critical issue for conservation in Africa. In: T. Matiza and H. N.Chabwela (eds). Wetlands conservation conference for Southern Africa. Proceedings of the Southern African Development Co-ordination conference held in Gaborone, Botswana, 3-5 June 1991. IUCN, Gland, Switzerland, p 1-8.
- FAO (1996). Non.wood News 3 1996. An information bulletin on NWFPs FAO, Rome 1996 PP, 2.
- Frenzel (1996). Choosing the right tress: Setting priorities for multipurpose tree improvement. ISNAR Research Report NO-8. The Hague International Service for National Agricultural Research.
- Osemeobo, G.J. (1988). Impact and performance evaluation of smallholder participation in tree planting, Nigeria. Agricultural Systems. Elsevier Science publishers Ltd, England 29 (1989) 117-135.
- Mccall, G.J. and Simmons, J. (1969). Issues in participant observations: In; Barbier, E. (ed). Practice of Social Research. Wadsworth Publishing Co, Bedmont California.
- Ramsar. (1997).Strategic plan 1997-2002.Convention on Wetlands. Convention Bureau Gland, Switzerland. Convention on Wetlands, 15 p
- Uke, C.M. (2010). Marketing of *Irvingia gabonensis* in Ibadan Metropolis, Oyo State, Nigeria. B. For. Thesis Dept. of Forestry and Wildlife Management, Federal University of Agriculture, Abeokuta. Nigeria . 60p