

# Non-Timber Forest Products: An Evaluation of Stakeholders' Knowledge, Utilization and Prospects for Development in Dasse Chiefdom, Moyamba District, Sierra Leone

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**Abstract** A survey on available Non-Timber Forest Products (NTFPs) was conducted in community forests within Baoma, Pambela and Domboma communities in Dasse Chiefdom, Moyamba District, Sierra Leone. The aim was to evaluate community inhabitants' knowledge of the uses of these NTFPs. Plant and animal parts exploited by inhabitants were identified and a strength, weaknesses, opportunities and threats (SWOT) analysis of NTFPs potentials for development in the study areas was also conducted. Data were collected using structured questionnaires, interviews and ocular observations. Sixty-five questionnaires, representing 100% of adult population of the communities was administered. Data was analyzed using descriptive analysis. Thirty-two NTFPs of plant and animal origins was identified to be used by the people in the communities studied. All respondents claimed to know the uses of NTFPs identified in their respective communities; with most of them (Baoma - 84.00%, Pambela - 80.00% and Domboma - 89.29%) acquiring such knowledge from elders while growing up in their families. Respondents accounts revealed that, identified NTFPs were used for: medicines, food (e.g. plants, wild game and honey) and other uses such as fodder, winnower, fasteners, fuel-wood, game traps, local floor mat, home roofing, fishing nets and craft, e.g. (from rope, tree branches and rattan). Findings from the SWOT analysis revealed that the strict enforcement of subsisting bylaws in the 3 communities is a major source of strength to NTFP development in the communities; while lack of access to wider market is a weakness. However, prospect of employment to the people represents opportunities from NTFP development in Baoma and Pambela, while prospects of promoting poverty alleviation and local development signifies opportunities in Domboma. Farming activities in the community forests is seen as the major threat to NTFP development in the 3 communities.

**Keywords** Non-timber forest products (NTFPs), Boama, Pambela, Domboma, Community Forest, Sierra Leone

## 1. Introduction

Since the early 1990s, the role of non-timber forest products (NTFPs) for sustainable forest use and poverty alleviation has received increased attention (Cifor, 2003). The original idea on the potential of NTFP exploitation as a way to sustainable forest management was primarily based on the assumption that the commercial extraction of NTFPs from natural forests could simultaneously serve the goals of biodiversity conservation and poverty alleviation, (Anderson, 1990; De Beer and McDermott, 1989; Ahenkan and Boon, 2008; Panayotou and Ashton, 1992; Plotkin and Famolare, 1992; Ros-Tonen *et al.*, 1995; Ruíz Pérez, 1996).

According to Tinde, (2006), NTFPs form an integral part of the livelihood of the 500 million people who live in or near tropical forests. Even though this number may be deemed a low estimate, and does not reflect the large number of temperate and boreal forest users, it nevertheless provides us a good indication of and the important roles forest resources play in the lives of rural people.

Non- Timber Forest Products comprise medicinal plants, dyes, mushrooms, fruits, resins, tree bark, roots and tubers, leaves, flowers, seeds, honey and so on and are sources of food and livelihood security for communities living within forests and its fringes. NTFPs are also called “minor forest products” in national income accounting systems and also known as Non-wood, secondary, special or specialty forest products (Shackleton, *et.al.*, 2011).

Compared to timber, the harvesting of NTFPs seemed to be possible without major damage to the forest and its

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environmental services and biological diversity. In sum, NTFPs are expected to offer a model of forest use which could serve as an economically competitive and sustainable alternative to logging.

Hunting is one of the oldest and most basic relationships between humans and the natural world. However, contrary to popular perception, hunting continues to be widely pursued in rural areas across the globe, particularly within forested ecosystems that provide food, fibres and medicine for subsistence use and for trade. Nonetheless, the promotion of NTFPs commercialization as a pathway to forest conservation and rural development has proven to be contentious; nevertheless, researchers have queried the value of creating NTFP exploitation hubs (Sunderland, *et.al.*, 2004), the practicability of marketing rainforest products (Dove, 1993), and the sense in integrating NTFPs into rural development strategies (Emery, 1998). Homma, (1992) concluded that NTFPs form an unsteady economic base for rural people and hypothesized that NTFP collection pressures bring about one of two fates: overexploitation and plant population decline, or replacement by systems that offer cheaper economies of scale, principally domestication or synthetic substitution. Homma's hypothesis is invalid when applied to subsistence use of NTFPs, though it indicates some major challenges in NTFP commercialization and the integration of NTFPs into rural development schemes.

Globally, Non-Governmental Organizations (NGOs) and donors are promoting green certification as a market-based tool to support environmental sensitivity in production practices in the forest industry. Consequently, hundreds of millions of hectares of forests have been certified worldwide for timber production, and various interest groups are also certifying NTFPs. Although this is not yet the situation in Sierra Leone, some effort are currently being made to conserve areas with high biodiversity under a 'Community Based Forest Management (CBFM)' project pioneered by the Food and Agricultural Organization of the United Nations – Sierra Leone (FAO -SL). The 3 year programme which started around 2015, secured and conserved about 50 hectares of biodiversity rich forests in 4 pilot communities (Baoma, Pambela, Domboma and Gbaima-songa) and identified NTFPs as a key component. Aside the fact that these communities had small human populations and were selected due to their respective richness in biodiversity, the project managers also found that traditional heads and inhabitants of these communities did not tolerate commercial exploitation of wood products from forests in their communities; especially for fire-wood and charcoal production.

This study therefore sought to investigate knowledge-base of residents in each of these 3 communities (Baoma, Pambela and Domboma, Mano-Dasse Chiefdom, Moyamba District) about the importance of NTFPs, how they impact social and economic lives of the people and prospects for the development of NTFPs in those communities.

## 2. Methodology

### 2.1. Description of Study Area

The three communities studied for this research are located in the Mano-Dasse Chiefdom, Moyamba District, Sierra Leone.

#### 2.1.1. Moyamba District

Moyamba district is in the Southern Province of Sierra Leone and borders the Atlantic Ocean in the west, Port Loko district and Tonkolili district to the north, Bo district to the east and Bonthe district to the south. It has a population of 346,771, (Statistics Sierra Leone, 2021) and lies on 8°00N 12°30W and its capital and largest city is Moyamba. Other major towns include Njala, Rotifunk and Shenge. The district is the largest in the Southern Province by geographical area with a land area of 6,902 km<sup>2</sup>, (Wikipedia.org, 2022) and comprises of fourteen chiefdoms namely; Lower Banta, Upper Banta, Timdale, Bagruwa, Kagboro, Dasse, Kowa, Kaiyamba, Kongbora, Kori, Kamajei, Fakunya, Ribbi and Bumpe. The ethnicity of the district is largely homogeneous with the Mende forming 60% of the population; the other ethnic groups comprise Sherbro, Temne and Loko.

#### 2.1.2. Mano-Dasse Chiefdom

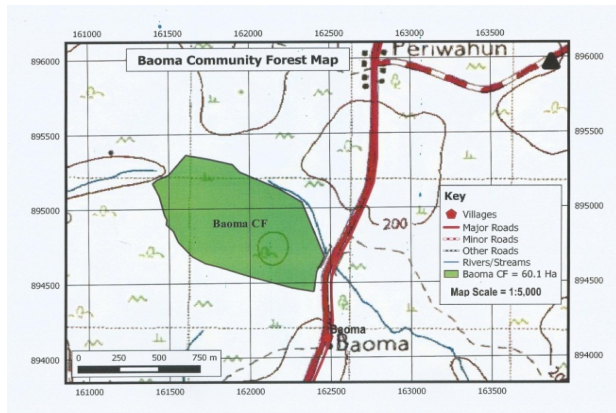
Mano-Dasse is a Chiefdom in Moyamba district, located along the old highway from Freetown to Bo and accommodates the 3 communities (Boama, Domboma and Pambela) hosting the 3 community forests studied for this research. It has a population of 13,265, (Statistics Sierra Leone, 2021).

The chiefdom is populated with both nationals and foreigners who migrated for business propose due to the existence of a train station at Dasse in the 90s; and some of these people stayed in the community after the closing of the railway station. However, the Mende tribe remains the most populated in the chiefdom, making the Mende language the dominant language spoken in the chiefdom.

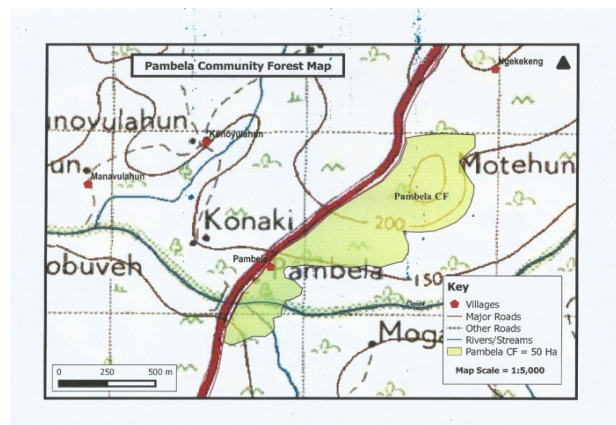
However, as krio is the most commonly spoken language in the country, many of the people in the chiefdom speak both krio and mende. The chiefdom is geographically divided into 14 administrative sections, they are: Domboma, Semabu, Foyia-Teawa, Mano Town, Jayiahum, Kenema, Neaty-Kiorie, Tanenihum-Konmor, Bongoyia, Taninihum-Kapuma, Youngifun, Babonbu Tommy, Temedi and Foyia-Gutpa. This study was carried out in the Domboma section which has eleven (11) villages (Mosheale, Kpaguma, Makambo, Moghah, Boama, Konovruhum, Batiama, Pambela, Domboma, Shahum and Dayma).

As earlier stated, the 3 communities selected for this study were Boama, Domboma and Pambela. They are small contiguous communities with low human populations and majority of the people in each of the 3 communities were farmers; but the communities are rich in biodiversity and the

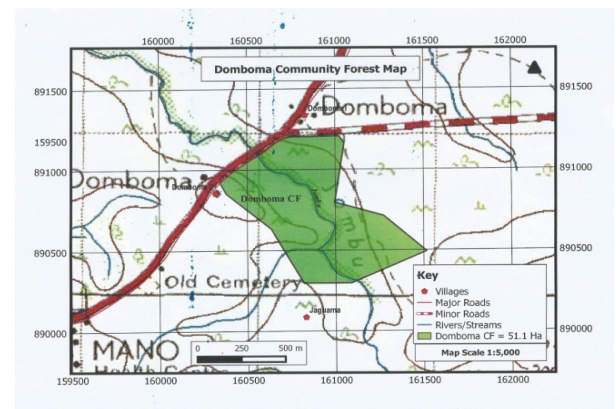
traditional heads disallow commercial exploitation of forest products from their forests. According to sources at the Food and Agricultural Organization of the United Nations-Sierra Leone (FAO-SL), these were some key factors for selecting them for the “Pilot Phase” of the FAO-SL Community-Based Forestry Management Project (CBFM). FAO-SL sources also confirmed that land areas reserved for CBFM in the each of the 3 communities are as follows; Baoma: 60.1 hectares (Figure 1), Pambela: 50 hectares (Figure 2) and Domboma: 51.1 hectares (Figure 3).



**Figure 1.** Baoma Community Forest Map (Source: FAO – SL)



**Figure 2.** Pambela Community Forest Map (Source FAO – SL)



**Figure 3.** Domboma Community Forest Map (Source FAO – SL)

## 2.2. Sample Population

According to the 2021 Sierra Leone Mid-term census, the

population of Moyamba district was 346,771 - (167,836 male and 178,935 female). Dasse chiefdom had a population of 13451 (6700 male and 6751 female) and it is the 10<sup>th</sup> largest populated Chiefdom in Moyamba District. The Mid-term census data however did not include population figures at community levels, therefore prior to data collection for this study, a reconnaissance survey was conducted to collect preliminary information and to carry out a door-to-door household census of inhabitants of each of the 3 communities sampled. A total of 239 people, (adult males and females, youths, children and infants) believed to live in the 3 communities were counted. However, key respondent groups sampled for this study was categorized as adult male, adult female and youth (Male and Female). To further synthesize categorization of the stakeholder groups, this study adopted the United Nation definition of Youth, (UN.org, 1981), which defines ‘youth’, as those persons between the ages of 15 and 24 years; was adopted for this study. Consequently, respondents from age 25 years and above were considered as adults.

## 2.3. Sample Size

Results of the reconnaissance survey revealed that the cumulative population of both adults and youths in the 3 communities totaled 121 people. Therefore, due to the small human population size of the selected communities, 100% sampling intensity was targeted. However during data collection, only a total of 65 respondents were available for sampling; representing 54.16% of the target population. These comprised of 25 respondents in Baoma, 12 in Pambela and 28 in Domboma.

## 2.4. Data Collection

Data for this research were obtained from both primary and secondary sources. Primary data were obtained using open and closed ended structured questionnaires to collect data from respondents. These contained uniform sets of questions to which respondents were subjected, therefore making their views to be analysed at the same level. Secondary data were sourced through desk study.

## 2.5. Data Analysis

Data collected was analysed using descriptive analysis. Analysed data are presented here in, percentages, tables and graphs.

# 3. Results and Discussion

## 3.1. Results

### 3.1.1. Non-Timber Forest Products (NTFPs) Identified in the Three Communities Sampled

Thirty two (32) NTFPs currently being used by respondents were identified, out of which about 84.40% and 15.60% were plant and animal-based respectively. The most represented families were Fabaceae (12.50%), followed by

Arecaceae (9.37%) and lastly, both Anacardiaceae and Dioscoreaceae (6.25%). The NTFPs were identified by respondents using their respective local names (in Mende and/ Krio) and samples and pictures taken for subsequent scientific identification and clasification at the Njala university herbarium. A list of the identified NTFPs identified were clasified into their respective local, scientific and family names as seen in Table 2 below.

**Table 1.** The Demographic Characteristics of the Respondents

Respondents		Baoma	Pambela	Domboma	Total
Gender	Male	11	8	15	34
	Female	14	4	13	31
	<b>Total</b>	<b>26</b>	<b>12</b>	<b>28</b>	<b>65</b>
Age	15-24	9	1	7	16
	25-39	5	6	18	29
	40-55	11	4	2	17
	>55	1	1	1	3
	<b>Total</b>	<b>26</b>	<b>12</b>	<b>28</b>	<b>65</b>
Education	None Formal	18	6	13	36
	Primary	1	3	6	10
	Secondary	7	3	9	19
	Tertiary	0	0	0	0
	<b>Total</b>	<b>26</b>	<b>12</b>	<b>28</b>	<b>65</b>
Marital status	Married	19	10	20	48
	Single	6	2	8	16
	Widow/Widower	1	0	0	1
	<b>Total</b>	<b>26</b>	<b>12</b>	<b>28</b>	<b>65</b>

**Table 2.** List of Non-Timber Forest Products Familiar to the Respondent in the Three Communities

S/N	Local Name	Source		Scientific Name	Family Name
		Plant	Animal		
1	Boboi	√	-	<i>Funtunia africana</i>	Apocynaceae
2	Popondaa	√	-	<i>Piper umbellatum</i>	Piperaceae
3	Fawei (seed)	√	-	<i>Pentaclethra macrophylla</i>	Fabaceae
4	Black Tumbla	√	-	<i>Dialium guineense</i>	Fabaceae
5	Malombo	√	-	<i>Salacia senegalensis</i>	Celastraceae
6	Gboogy	√	-	<i>Spondias mombin</i>	Anacardiaceae
7	Gawui (bush yam)	√	-	<i>Dioscorea multiflora</i>	Dioscoreaceae
8	Gbunien	√	-	<i>Pteridium aquilinum</i>	Dennstaedtiaceae
9	Wild Coco	√	-	<i>Discorea sp</i>	Dioscoreaceae
10	Kafi	√	-	<i>Sorindeia grandifolia</i>	Anacardiaceae
11	nDawa	√	-	<i>Parinari excelsa</i>	Chrysobalanaceae
12	Ngogbo-jele-gbo	√	-	<i>Uvaria chamae</i>	Annonaceae
13	Wild palm fruit	√	-	<i>Elaeis guineensis</i>	Arecaceae
14	Palm wine	√	-	<i>Elaeis guineensis</i>	Arecaceae
15	Mushroom	√	-	<i>Agaricus bisporus</i>	Agaricaceae
16	Bush Pineapple	√	-	<i>Ananas comosus</i>	Bromeliaceae
17	Giant Snail	-	√	<i>Achatina achatina</i>	Achatinidae
18	Monkey	-	√	<i>Chlorocebus tantalus</i>	Cercopithecidae
19	Free tambo	√	-	<i>Cephalophus maxwelli</i>	Bovidae
20	Fish	-	√	<i>Siluriformes</i>	Ariidae
21	Termite	-	√	<i>Isoptera</i>	Rhinotermitidae
22	Bee	-	√	<i>Anthophila</i>	Apidae

S/N	Local Name	Source		Scientific Name	Family Name
		Plant	Animal		
23	Gbangba	√	-	<i>Cassia sieberiana</i>	Fabaceae
24	Yumbu yambay	√	-	<i>Nauclea latifolia</i>	Rubiaceae
25	Zanglawu)	√	-	<i>Chromolaena odorata</i>	Asteraceae
26	Gba-gbema	√	-	<i>Mimosa pudica</i>	Fabaceae
27	Mbalui	√	-	<i>Eremospatha macrocarpa</i>	Palmae
28	Yemani	√	-	<i>Gmelina arborea</i>	Verbanaceae/ Lamiaceae
29	Ndadai	√	-	<i>Thaumatococcus daniellii</i>	Marantaceae
30	Kowo	√	-	<i>Hibiscus sterculiifolius</i>	Malvaceae
31	Bamboo	√	-	<i>Bambusoideae disambiguation</i>	Poaceae
32	Palm Frond	√	-	<i>Elaeis guineensis</i>	Arecaceae

Source: Field study

### Respondents Knowledge of the Uses of NTFPs Identified in the Study Area

All of the respondents (100%) sampled in the three villages claimed to be knowledgeable of the uses of NTFPs identified (Table 3). Dwellers of these three forest fringe communities are almost completely dependent on forest resources for their domestic and livelihood needs, therefore, knowledge of the uses of available NTFPs is imperative; as NTFPs are vital for subsistence and meeting the sources of daily nutrition (Vedeld *et al.*, 2007).

Knowledge of NTFP use is crucial to these people to enable them understand which forest products may be used for specific purposes; for example, such knowledge is required to distinguish edible from poisonous plants, useful, useless or potentially dangerous medicinal plants, parts, quality or doses, as well as those used for crafts and other uses.

**Table 3.** Respondents Knowledge of the Uses of NTFPs Identified in the Study Area

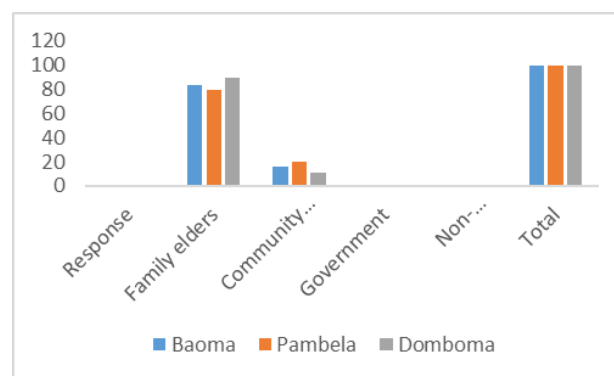
	Baoma	Pambela	Domboma
Response	%	%	%
A	100	100	100
B	0	0	0
Total	100	100	100

KEY RESPONSE: (a). Yes (b). No

### Sources of Respondents' Knowledge of the Use of NTFPs

Amongst the 65 respondents sampled in Baoma, Pambela and Domboma respectively 84%, 80% and 89.29% of them stated that they acquired knowledge of uses of NTFPs identified during the study from family elders. On the other hand, 16%, 20%, 10.71% of the respondents from Baoma, Pambela and Domboma respectively claimed the knowledge was from other community elders; while 0% of them got it from either government or NGOs (Figure 4). This is either an indication that there are very strong traditional believe systems influencing generational transfer of information in the three communities or the inhabitants of these three communities had not received attention from both government and NGOs regarding NTFPs prior to this study;

or both.



**Figure 4.** Sources of Respondents Knowledge of NTFPs

### Classification of Identified NTFPs Based on Usages

The 32 NTFPs identified were classified into food, medicine and others, based on usage, (Table 4). Consequently, approximately 71.87%, 12.5% and 18.75% of the NTFPs identified were useful for food, medicine and other purposes respectively. This finding corroborates that of Agbogidi and Okonta (2003) that NTFPs range from being used as food or food additives, medicines, and crafts among others. Also, Shiva and Verma, (2002) reported that NTFPs can be classified in many different ways; according to ends use (medicine, food, drink, etc.) by the part used (roots, leaves, barks, etc.). Similarly, John and Moundu (2006) affirms that forest plants product plays extremely important roles in ensuring adequate nutrition to communities that depend on them. Also Brima, (2012) reported that during the eleven years rebel war in Sierra Leone, people survived on bush yam (*Dioscorea spp.*) and cabbage from wild oil palm.

These findings agrees with Bennett and Robinson, (2000) who found and reported that wild food continue to provide the major portion of animal fats, proteins and minerals in the diet of millions of people. Likewise, Kayambazinth *et al.*, (2005) reported that the ready accessibility of medicinal plants, has increased its collection and use in forest fringe communities.

## NTFPs Used as Food and the Parts Consumed

**Table 4.** NTFPs Used as Food and the Parts Consumed

S/N	Scientific name of source	NTFPs (Parts Used)	End Use
1	<i>Funtunia Africana</i>	Seed	Food
2	<i>Piper umbellatum</i>	Leaf	Food
3	<i>Pentaclethra macrophylla</i>	Seed	Food
4	<i>Dialium guineense</i>	Seed	Food
5	<i>Salacia senegalensis</i>	Seed	Food
6	<i>Spondias mombin</i>	Fruit	Food
7	<i>Dioscorea multiflora</i>	Tuber	Food
8	<i>Pteridium aquilinum</i>	Fruit	Food
9	<i>Discorea sp</i>	Tuber	Food
10	<i>Sorindeia grandifolia</i>	Fruit	Food
11	<i>Parinari excelsa</i>	Fruit	Food
12	<i>Uvaria chamae</i>	Fruit	Food
13	<i>Elaeis guineensis</i>	Fruit	Food
14	<i>Elaeis guineensis</i>	Stem Juice	Food
15	<i>Agaricus bisporus</i>	Entire plant	Food
16	<i>Ananas comosus</i>	Fruit	Food
17	<i>Achatina achatina</i>	Flesh	Food
18	<i>Chlorocebus tantalus</i>	Flesh	Food
19	<i>Cephalophus maxwelli</i>	Flesh	Food
20	<i>Siluriformes</i>	Flesh	Food
21	<i>Isoptera</i>	Entire insect	Food
22	<i>Anthophila</i>	Honey	Food
23	<i>Thaumatococcus daniellii</i>	Fruit	Food

Source: Field study

About 71.87% of the NTFPs identified were useful as food and the parts consumed depend on whether its plant or animal based. Parts often consumed for plant-based NTFPs ranged from seeds, leaves, fruits, tuber, entire plant (in the case of mushroom) and by-products such as stem juice (e.g. palm wine). Part consumed for animal-based NTFPs is usually the flesh, entire organism (e.g. Termite) and products such as honey from Bees, (Table 4). This findings agree with views of Kajembe and Monela, (2000) who reported that forest plants product plays extremely important roles in ensuring adequate nutrition. This statement was also implied by John and Moundu, (2006)' that wild food continue to provide the major portion of animal fats, proteins and minerals in the diet of millions of people.

## NTFPs Used as Medicine, Including Parts Used and Diseases Treated

Four (*Cassia siberina*, *Nauclea latitobia*, *Choromolina odoratum* and *Memosapudica*) out of the thirty-two NTFPs identified were named by respondents to possess medicinal properties and used for the treatment of various ailments. Ailments treated included malaria, boils and named injuries, (Table 5). The NTFPs named were all plant-based and parts used for medicine preparations are roots and leaves. The named plant parts were noted to be processed into concoctions and given to the sick to drink or applied to injured body parts. This findings validate the statement made by Muriuki, (2006) reporting a research conducted by the Kenyan Medical Research Institute (KEMRI) on how traditional anti-malaria treatment methods reveal the potential of traditional methods for vector control and repellent, prevention and treatment.

**Table 5.** NTFPs Commonly Used for Medicines and Diseases Treated in the Study Area (All plants)

S/N	Local name of Source	Scientific name of Source	NTFPs (Plant parts Used)	Diseases Treated	End Use
1	Gbangba	<i>Cassia sieberiana</i>	Roots	Malaria	Medicine
2	Yumbu yambay	<i>Nauclea latifolia</i>	Roots	Malaria	Medicine
3	Zanglawa	<i>Chromolaena odorata</i>	Leaves	Boils and wounds	Medicine
4	Gba-gbema	<i>Mimosa pudica</i>	Leaves	Sores	Medicine

Source: Field study

**Table 6.** NTFPs Used for Other Purposes (All plants)

S/N	Scientific name of Source	NTFPs (Plant parts Used)	End Use
1	<i>Eremospatha macrocarpa</i>	Stem	Winnower, cane chair and local mat.
2	<i>Gmelina arborea</i>	Stem, leaf and seed	Fuel wood and fodder for livestock.
3	<i>Thaumatococcus daniellii</i>	Bark of the stem	Used to set as trap, use to make hammock and basket.
4	<i>Hibiscus sterculiifolius</i>	Bark of the stem	Used to make local fishing net and used to tie fire wood.
5	<i>Bambusoideae disambiguation</i>	Stem	Use to make fence, local mat and chair.
6	<i>Elaeis guineensis</i>	Leaf	Thatch used for roofing farm hut and making broom.

Source: Field study



**Table 7.** SWOT ANALYSIS

INTERNAL		EXTERNAL	
Strength	Weaknesses	Opportunity	Threats
1. existence of forest management committee 2. existence of by-laws 3. forest vigilance	1. lack of access to market 2. lack of improved methods of NTFP processing 3. weak or underdeveloped value chain	1. employment 2. development of small scale industries 3. poverty reduction	1. farming activities 2. pressure from increased demand for timber 3. hunting 4. unfavourable government policies

Source: Field study

### NTFPs Used for Other Purposes

Some of the plant-based NTFPs identified were also applied to other uses besides food and medicine. Some of the other uses identified included; fodder for certain ruminants, production of some locally made household items such as winnows, cane chairs, local mats, etc. These are itemized in Table 6 above.

### Prospects for the Development of NTFPs in Communities Sampled

In order to assess prospects for the development of NTFPs in the 3 communities sampled, a Strength, Weaknesses, Opportunities and Threats (SWOT) analysis was conducted in conjunction with respondents. This analysis reviewed both internal and external factors that could impact prospects for NTFP development in the 3 communities.

Summary of the SWOT analysis in the 3 communities revealed that existence of forest management committee, by-laws and forest vigilance as strength of NTFPs development in the 3 communities; while lack of access to market, lack of improved methods of NTFP processing and weak or underdeveloped value chain were identified as key weaknesses. On the other hand, key opportunities identified were, employment, development of small-scale industries and poverty reduction; while major threat identified were, farming activities, pressure from increased demand for timber, hunting and unfavourable government policies.

The forest management committees in the 3 communities were set up with the help of the FAO-SL to protect the communities in addition to subsisting forest protection by-laws in the communities. Although their activities were targeted at protection of forest wood products, they are also indirectly protecting NTFPs. However, in spite of this strength, the geographic isolation of the communities and demographic limitations (old population with no formal education) diminishes their prospects of access to market, post-harvest technology and value chain development. It suffices to deduce then that if these communities could enhance their strength to tackle threats, while capacity is developed to confrontation the weaknesses, the gains of the opportunities becomes pronounced and prospects of NTFP development ultimately increases in the 3 communities. Findings of other researchers in this field either fully or partly agree with findings of this research. For instance, in line with findings of this research, (Martin and Killmann, 2005) reported that inadequate awareness, lack of

infrastructures and access to markets, low volume of NTFP products, poor handling and storage are the major constraints to the formal development of markets for NTFPs.

However, (Wunder, 2001; Arnold, 2002) in their report stated that that selling forest products may serve as means of obtaining money in times of necessity and that the scope for poverty alleviation through NTFPs extraction from natural forests does not relate to boosting incomes, but rather to its role as a safety net for the poor. From these views and lessons learned from this study, one could then cautiously deduce that prospects for developing NTFPs for income in these and similar forest fringe communities must be viewed not necessarily as a sole livelihood activity, but as an additional, supplementary or alternative source of income.

## 4. Conclusions

- Non-timber forest products identified and used by respondents were mostly from plant origin.
- Family elders are the major sources of information on the importance of the importance of NTFPs in the communities studied.
- NTFPs identified from both plant and animal origins were mostly consumed as food.
- With existing strong forest governance in the communities sampled, there are prospects for the development of NTFPs; although income from this source could only be for alternative livelihood and not as major income source in order to maintain forest biodiversity and ecosystem integrity.

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