

Typology and Trends of Forest Products in Manjo Subdivision, Littoral Region, Cameroon

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DOI: <https://dx.doi.org/10.47772/IJRISS.2024.8110238>

Received: 06 October 2024; Accepted: 19 October 2024; Published: 21 December 2024

ABSTRACT

Forest resource economic, social and cultural gains are taking stands in forest adjacent communities of Cameroon portraying momentous swings from local subsistent to modern market-driven forest resource exploitation. Manjo Subdivision in the Littoral Region is one of such important hot spots in Cameroon where forest resources that the local population depends on their exploitation for socioeconomic and cultural livelihoods are exposed to environmental threats. The main aim of this paper is to identify and examine the trends of forest products in order to propose measures to those with negative trends. The results obtained from data collected through a sampled of 392 administered questionnaires, complemented with field interviews, Focus Group Discussions, field observations and documentaries assessment showed that several categories of forest products viz; timber, wild ropes, medicinal plants, animal-based products, wild plant leaves, palm wine, wild vegetables, fuel wood, wild fruits, pining poles, stakes, snails and honey are exploited in Manjo Subdivision. From these forest products, bush meat, medicinal plants and timber products among others are the main products with perceived negative trends while fuel wood, wild leaves and charcoal were the main products with perceived positive trends by the population in the study area. We therefore recommended that the driving forces of forest resource degradation and loss should be investigated through the promotion of research by the City Council of Manjo and measures put in place to enhance forest resource sustainability in the study area.

Keywords: Typology, forest products, trends, Manjo Subdivision

INTRODUCTION

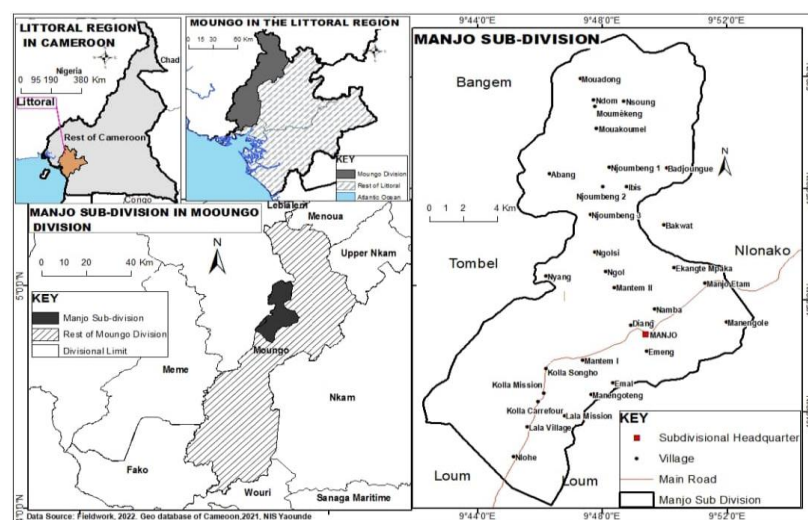
Forest resources are of pivotal important as the products serve as sources of livelihood support to humans on earth [1-3]. These forest products include timber, vegetables, nuts, wild fruits, edible roots, honey, leaves, medicinal plants, fuel wood, roots, poisons and bush meat. Globally, about 300 million people especially those living in forest adjacent communities in rural areas collect these products daily and many regard selling them as a means to earn a living [4-7]. In less developed countries, about 80% of the population depends on the exploitation of forest products for their health, nutritional needs and income generation [8]. In Africa, these forest products are increasingly under threats owing to forest lands decline resulting from unsustainable agricultural practices, rapid urban expansion, timber exploitation, and soaring population [9]. Cameroon like many other counties in Africa is home to a variety of forest products, which the local population depend on their exploitation for livelihoods sustenance. Albeit the Cameroon is rich in both flora and fauna biodiversity making it second in Central Africa and fourth in Africa, the country lost about 4,400,000 hectares (18%) of forest cover at an average rate of 220,00ha (0.9%) annually [10] as cited in [2]; [11]. Approximately 3.3 million hectares was lost between 1990 and 2005. That is, within 15years Cameroon lost 13.4% of its forest cover, a trend dangerous to its forest products [12]. Manjo Subdivision is a vivid example of communities in

Cameroon characterized with diverse forest products, which the local population depend on their exploitation for survival. These forest products are increasingly threatened due to forest cover decline resulting from agricultural land use expansion, timber exploitation and inadequate cultivating land outside the forest and population increase [1]. Therefore, this study sought to identify the types, examine the trends and proposed measures to enhance the sustainability of forest products with negatives trends in Manjo Subdivision, Littoral Region of Cameroon.

STUDY AREA AND RESEARCH METHODS

Study area: the study was carried out in Manjo Subdivision in the Mungo Division, Littoral Region of Cameroon (Figure 1). It is located between latitudes 4° 42 and 4° 50 North of the Equator and longitudes 9 ° 41 and 9 ° 50 East of the Greenwich Meridian. Manjo Subdivision covers a surface area of about 305 square kilometres and a population of over 40250 inhabitants (Council Development Plan-CDP, 2012). It is situated in the western part of the Mungo Division and is bordered to the North by Nkongsamba III Subdivision and Mount Manengouba, to the West by Koupe Manengouba Division, to the East by Nlonako Subdivision and Nkongsamba and to the South by Loum Subdivision.

Fig.1: Location of the study area



Source: Adapted from [1]

Manjo has an altitude that varies between 450m in the South towards Loum Subdivision and 1200M to the northern slopes of mount Manengouba. As concern vegetation, Manjo Subdivision is characterized by grasslands, gallery forests and domesticated woodland vegetation, which are conserved for socioeconomic, cultural and environmental importance to the population [1]. The climate is that of the equatorial type with two distinct seasons: a long rainy season of eight months (March to October) and a short dry season of four months (From November to February) with annual average temperature that varies between 26.3 °C to 26.5 °C.

Research Methods: preliminary field visits and contacts established with forest exploiters, sellers forest products and the representatives of the Delegations of Forestry and Wildlife, Agriculture and Rural Development-Manjo as well as some staff of the Municipal Council of Manjo. These helped in identifying the different types of forest products as well as the forest adjacent villages found in the study area. Besides, three hundred and ninety-two (392) open and closed questionnaires were designed and purposely administered face-to-face to forestry agents of the Delegation of Forestry and Wildlife as well as forest exploiters, sellers of forest products in identified forest adjacent villages (Ngol, Lala, Ngolsi, Abang, Kolla Carrefour, Mantem 1, Njoubeng, Ndoum, Nsung, Manegole, Emeng, Nlohe and Moundong) to evaluate their perceptions on the trends of forest products in the study area. Also, in-depth interviews (with the representatives of the Sub-Divisional Delegations of Forestry and Wildlife, Agriculture and Rural Development), one (1) Focus Group Discussion (made up of three women and for men) as well as direct field observations were carried out to have an in-depth understanding about the different types and trends of forest products found in Manjo Subdivision.

Descriptive analysis was employed for quantitative data to obtain statistical tables (Tables 1 and 2) and a bar chart (Figure 1) representing the population opinions in respect to types and trends of forest products in Manjo Subdivision. Qualitative data obtained from interviews, focus group discussion and field observations were sorted out manually and were summarized according to the various sub-headings of the study in order to avoid confusion and to make it more meaningful. This data was used to complement statistical data obtained from the administration of questionnaires. Open-source GIS (Quantum Geographical Information System-QGIS 2.18) was used to spatialise the exploitable sources of forest products and the location map of the study area.

RESULTS AND DISCUSSION

Categories of Forest Products Exploited in the Study Area

Manjo Subdivision is blessed with rich forest estates, which cut across several communities within the area. These forests are cornucopia of plants and animal species, which constitute a source of livelihood to the local population as the products are either placed for household use or for commercial purposes especially in forest adjacent communities [1]. In order to ascertain the typologies of forest products in Manjo Subdivision, several variables were chosen and scaled following the likert five points viz; Strongly Agree, Agree, Disagree, Strongly Disagree and Undecided to express the population’s opinions and the scores presented in Table 1.

Table 1: Different types of forest products in Manjo Subdivision

Category	Scaling (%)				
	SA	A	D	SD	U
Timber	48.6	39.7	3.7	2.2	5.8
Medicinal plants	51.4	30.7	10.1	3.8	4.0
Games	43.8	34.7	14.1	3.8	3.6
Wild leaves	35.3	37.8	13.9	4.8	8.2
Palm wine	46.8	36.5	7.6	2.0	7.1
Forest climbers	38.3	33.2	18.1	3.8	6.6
Wild vegetable	43.5	24.2	14.9	6.8	10.6
Fuel wood	54.8	31.7	5.4	8.1	0.0
Wild fruits	47.8	42.6	3.7	3.3	2.6
Pining poles	39.3	31.4	13.4	7.8	8.1
Stakes	40.6	14.1	14.6	11.1	19.6
Snails	49.3	27.4	9.1	8.8	5.4
Honey	36.5	18.1	19.9	8.1	17.4
Others, wild ropes,	20.1	17.4	19.9	8.1	34.5

Explanation: SA=strongly agree; A=agree; D=disagree; SD= strongly disagree; UN=undecided

Source: Field Survey, April 2024

Through field findings, several categories of forest products were identified in Manjo Subdivision (Table 1). These include timber, medicinal plants, bush meat, leaves, forest ropes, wild vegetable, fuel wood, wild fruits and nuts, pining pools, stakes, snails and honey. These categories of forest products, which the local population depend on for survival, were further explained in details in the following points:

Timber based forest products: These constitute all woody plants that can be exploited for timber [11]; [1]. Through field investigations, majority of the population (49.7%) agreed that these types of products are found in Manjo Subdivision. The products include camwood, iroko, sappele, white wood, small leaf and bubinga. The exploitation of these timber-based forest products is one of the economic activities practiced in Manjo Subdivision. The exploitation is done mostly during the dry season due to the poor state of roads. The products are mostly conserved through the selective method, where only the mature trees are exploited. This strategy is mostly carried out by timber exploiters especially in private controlled patches of forest lands. Besides, most farmers also used this selective method to conserved Timber based forest products. This always take place when farmers cut down forest lands for agricultural purposes. Timber based products are marked out and only those that cannot be exploited for timber are felled.

Medicinal based forest products: About 51.4% of the population strongly opined that the forests in Manjo Subdivision are blessed with a variety of medicinal plants products, which the local population depend on their exploitation for healthcare. These products range from fruits, seeds, roots, stems, leaves and tree barks. The products include *prunus africana* (barks), *garcinia lucida* (barks), *Petersianthus macrocarpus* (leaves), *aillonalla toxisperma* (barks), *cola acuminata* (seeds), *Masularia acuminata*(bark), *Milicia excels* (barks), *Alstonia boonei* (bark), *Ricinodendron heudelotii* (leaves, seeds, and roots), *Gnetum africanum* (leaves) and *Irvingia gabonensis* (barks, leaves, roots and stems). The medicinal plant products are used in households for the healing of ailment such as cough, malaria, typhoid fever, stomach ache, anti-poison and nausea [1]; [13]; [14]. It was further observed that most of the medicinal based forest products especially tree barks exploited by the local population in the study area are traded for income generation. Figure 2 presents some medicinal tree barks mostly exploited and sold for income generation in the study area.

Fig 2: Medicinal plant products harvested in Manjo



Source: Field Survey, April 2024

These tree barks are mostly harvested and sold by men and women of ages mostly above thirty years in the study area. This was assessed through field discussions with the population to probably be because the healing of ailments with medicinal plants depends mostly upon traditional knowledge and needs a lot of experience making it very difficult for the youths to get involved in the business. Besides, field testimonies further opined that not anyone can exploit these medicinal plants as some incantations are always made before exploitation especially those exploited in family shrines or sacred places.

Wild vegetables-based forest products: The main wild vegetable exploited by the local population in Manjo Subdivision is *Gnetum africana* (eru) locally called “*ekoke*” in Mbo dialect. This vegetable comes from the leaves of two species of *Gnetum*; *Gnetum africanum* and *Gnetum buchholzianum* lianas that grow in the forest. Eru is an evergreen leafy vine that grows in and around Manjo in forest openings, secondary forest, fallow

farm-lands and, at times, in active mixed-crop farms planted by households. Only the leaves (Figure 3) are harvested to prevent it from drying-off.

Fig 3: *Gnetum africana* (Eru) display at Emeng Market in Manjo



Source: Field Survey, April 2024

The exploitation of this product is mostly done during the dry season. This was assessed to be because the products resist changes with seasons. During the rainy season, most vegetation became greenish due to the availability of water for their growth making it very difficult for eru to be easily identified among other green plants unlike in the dry season when most plants shed their leaves due to water shortage. Eru becomes easily identifiable since its capacity to resist change is high making it greenish throughout dry seasons. Prior to high demand both within and out of the study area, households have resorted to the domestication of this forest product. This is done through the process of transplanting due to lack of hybrid seeds of the products. The young shoots identified growing naturally in the forests is transplanted near households' homes and farms.

Wild Fruits based forest resources: A large proportion of the population (47.8%) opined that the patches of natural forests that cut across Manjo Subdivision are cornucopia to variety of tree fruits products which serve as spices in majority of households. These wild fruit-based forest products include: *Irvingia gabonensis* (bush mango), *Piper quinensis* (bush pepper), *Ricinodendron heudelotti* (njangsang), *Pausinystalia yohimbe* (yohimbe), *Garcinia kola* (bitter cola), *Afrostryax lepidophyllus* (Country onion), *Cola lepidota* Schott (monkey cola), *Tetrapleura tetraptera* (four corners), *anacardium occidentale* (cashew) and black. Among these products, further findings revealed that *Irvingia gabonensis* (bush mango) is made up of two types which includes *Irvingia gabonensis* and *Irvingia wombolu* both acting as non-timber forest products in the study area. Figure 4 below illustrates an example of wild fruit-based forest products gathered or harvested by the local population in Manjo Subdivision.

Fig. 4: *Ricinodendron heudelotti* (Njangsang)



Source: Field Survey, April 2024

This njangsang (Zizang in Mbo dialect) is sold in dishes or in buckets as unit of measurement. Further field discussions with the sellers of this product hold that one bucket of njangsang costs 80000 FCFA in the study area. The price vary depending on the seasons as prices drop during the gathering seasons and increases very widely during periods of scarcities. This is the same scenarior with *Irvingia gabonensis* (Figure 5) as the price drop drastically during the harvesting seasons and only increase during seasons of shortages across the various market found in the study area.

Fig. 5: *Irvingia gabonensis* (Bush mango)



Source: Field Survey, April 2024

This product is of two types *Irvingia gabonensis* and *Irvingia wombolu*. The local population gather this product from the forest and surrounding farmlands especially during the rainy season. When these fruits get ripe, they fall off from the tree and are gathered and peeled (Figure 5A) before drying for proper use. When peeled, the seeds are being wash and dry before preparation for consumption or taken to the market. Further field testimonies hold that bush mango can easily be preserved for a longer period of time as compared to other perishable forest resources. This enabled the exploiters to be able to preserve the product during a fall in price while waiting for prices to rise. *Piper quinensis* (Figure 6) on the other hand was opined to be highly exploited from households' farms.

Fig. 6: Common wild fruits exploited in Manjo



Source: Field Survey, April 2024

This was assessed to be prior to the availability of hybrid seeds which are nursed and replanted by the local population in farms or near their Shomes. This bush pepper is collected from a vine (Figure 6 A) and is exposed under the sun for easy preservation. It is used as spices for the preparation of meals [1]. A large quantity of this product was revealed to be sold by exploiters to make income as only a small quantity is

consumed at the households levels. Other products like *Cola lepidota* Schott (Monkey Kola) and black (Figure 7) were identified to be among the perishable forest products exploited in the study area.

Fig.7: Samples of wild fruits display at the Manjo main market



Source: Field Survey, April 2024

These “black” and “monkey” kola (Figure 7) are either gathered under the host tree or are harvested directly from the tree. Monkey Kola is exploited and eaten raw and can be preserved only for a month meanwhile black is harvested and cooked before consumption. It was further explained that monkey kola is exploited in the study area in large quantities and as such, buyers came in from the neighbouring towns (Douala) in search of the products. At times, they move from one farm to the other buying directly from the farm owners before exploitation.

Games based forest products: Above 70% of the population (Table 1) in the study area opined that the forests found in communities in Manjo Subdivision such as Ngol, Ngolsi, Nsoug, Abang, Mouakonnell, Njoubeng and the slopes of Mount Kupe Manengouba are blessed with variety of game species. These game species include antelopes, deer, and forest genets, squirrels, chimpanzees, monkeys, monitor lizard, guinea fowls, green turacos, pangolins, rat moles, goliath frogs, tigers, brush-tailed porcupine and cane rats (Figure 8).

Fig.8: Variety of game in Manjo



Source: Field Survey, April 2024

The presence of these varieties of game species has encouraged most people in the study area to be doing hunting. It was found through field discussions that majority of people involved in hunting depend on it as a source of income. The hunting of games serves as sources of food and income generation to many inhabitants of the study area who are involved in this activity. The bush meat is mostly cooked and sale in places like the Manjo main market, Manjo Car Park as well as the Resting Spot at Boum quarter and the Toll Gate at Lala

village found along Dschang-Douala stretch of the road that cut across Manjo Subdivision from West to South. Albeit the trade in bush meat is lucrative to people in Manjo Subdivision, it was also revealed that the trade is confronted by several challenges. For instance, field discussions with the population opined that, in 2018, the Minister of Public Health reported the outbreak of monkey-pox, which is a zoonotic disease that took place in some parts of the neighbouring South West and Northwest Regions of Cameroon [15] as cited in [16]. The spread of this information crippled bush meat trade in the study area within 2018 as many hunters abandoned hunting for fear of being contaminated. This was because the Minister reported that the transmission of this monkey-pox is through human contact with animals.

Leaves and forest climbers: The forests in the study area also harbours important plant leaves-based products exploited by the local population for several uses. The products include *ngongo leaf*, palm and raffia leaves. The leaves are either used for thatching houses or as materials for the preparation of food. Besides, the main forest climbers exploited in the study area is *mawum*. This product is of great importance to the local population as it is locally prepared and used for the treatment of stomach disorder [1]. This *mawum* is a tree climbing product which grows naturally within the forests in the study area. This product which is in high demand in the study area is threatened due to the method of exploitation by the local population. As a tree climbing product, the stem is cut during the exploitation process and it is drawn from the host tree by the use of hands. This method makes the regrowth of the product difficult since it is the stem that is chop-off. Couple with the lack of nursery seeds as one of the major challenges confronting its sustainability [1], field testimonies further opined that it takes several years for the regrowth of *mawum* after exploitation.

Fuel wood forest products: Fuel wood is one of the key forest resources collected by the local populations living in communities in Manjo Subdivision. Almost all the trees in the forest are collected by the local population as fuel wood or burn for charcoal. These fuel wood and charcoal (Figure 9) provide fuel for a vast majority of households in the study area. Also, the products are highly collected and traded by population as sources of income.

Fig. 9: Traded fuel wood display in Nkwah quarter in Manjo



Source: Field Survey, April 2024

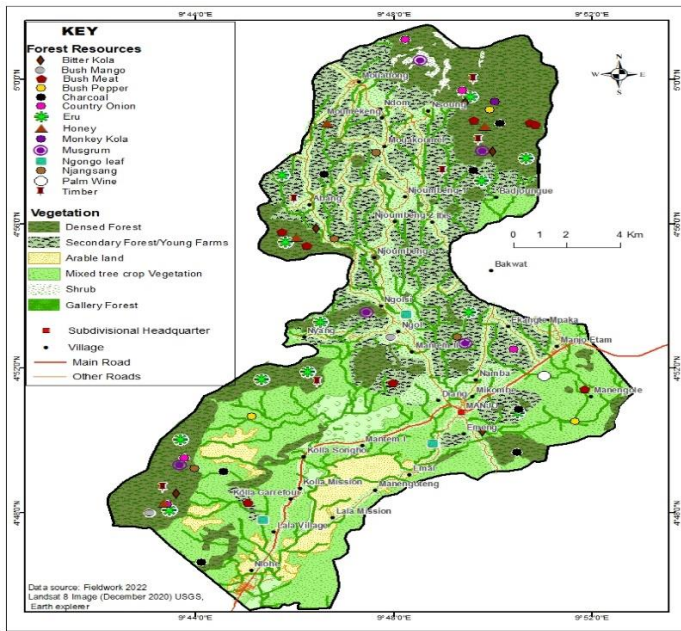
Based on field findings, only a small quantity of charcoal is used by the population of Manjo subdivision as the product is mostly transported to other towns such as Douala and Dschang for sale. This low used of charcoal in the study area is prior to the availability of firewood in large quantities as well as limited street trade vendors as fish, cocoyam and maize roasters as well as restaurants and bakeries which charcoal is their main source of energy.

Spatial Distribution of Exploitation Sources of Forest Products in Manjo Subdivision

Forest products in Manjo Subdivision are harvested both from the natural green fields (natural expanses and sacred places) and household farms. The products harvested from households' farms are either planted or are naturally grown forest products which are always protected by the population during the clearing of the forest

lands for agricultural land use. Among these forest products, majority are exploited in the natural patches of green fields found to the North-Eastern part of Manjo Subdivision especially in forest adjacent villages like Nsung, Badjoungue, Mouadong, Ndom, Mouakoumel and Njoumbeng 1 (Figure 14). These include mostly forest products such as bush mango, monkey kola, country onion, eru, njansang and timber products. Apart from these aforementioned sources, other exploitation sources identified in Manjo Subdivision include the forests of Abang, Ngol, Ngolsi, Nyang as well as the slopes of Mount Kupe Manengouba that bound Manjo Subdivision towards the Southwest. Figure 10 presents the spatial distribution of exploitation sources of forest products in the study area.

Fig. 10: Exploitation sources of forest products in Manjo Subdivision



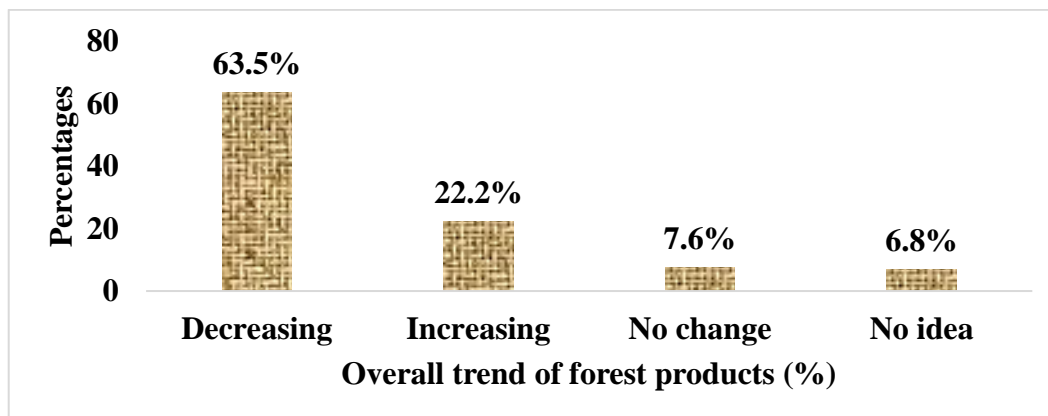
Source: Field Survey, April 2024

It should be noted that forest products such as *ngongo leaf* and bitter kola were identified to be harvested all over the study area. This was assessed to be attributed to the cultivation of these products by majority of the population.

Trends of Forest Products in Manjo Subdivision

Through field findings, majority of the population (63.5%) in the study area have the perception that forest products have decreasing trends meanwhile only a small proportion of them opined that the products have increasing trends (Figure 11).

Fig. 11: Overall perceived Trend in forest products in the study area



Source: Field Survey, April 2024

This decreasing trend of forest products (Figure 11) according to the majority of the population is attributed to forest land decline resulting mainly from agricultural land use expansion in the study area. To ascertain the various types of forest products with decreasing trends through which possible solutions can be made to prevent further degradation and loss, about sixteen (16) different types of products (Table 1) identified in the study area were further scaled following the likert five points to express the population perceptions and the scores presented in Table 2.

Table 21: Perceived change among the major categories of forest products

Forest products	Increase		Decrease		No change		% Change
	F	%	F	%	F	%	
Timber	65	16,6	290	74,0	37	9,4	-57.4
Medicinal plants	43	11,0	272	69,4	77	19,6	-58.4
Bush meat	42	10,7	326	83,2	24	6.1	-72.5
Plant leaves	343	63,3	134	24,7	65	12	38.6
Palm wine	105	26,8	235	59,9	52	13,3	-33.1
Wild ropes	197	36,3	214	39,5	131	24.2	-3.2
Wild vegetables	66	11.4	338	58.3	138	23,8	-46.9
Fuel wood	297	75,8	58	14,8	37	9,4	61
Wild Fruits	74	18.6	111	28,0	212	53.4	-9.4
Pining poles	103	25.9	215	54.2	79	19.9	- 28.3
Stakes	67	12.4	273	50,4	202	37.3	-38
Snails	66	12.2	138	25,5	338	62,4	-12.4
Charcoal	268	49,4	66	12,2	208	38,4	37.2
Honey	134	24,7	207	38,2	201	37,1	-13.5
Others, (climbers)	89	16.4	177	30.5	276	50.9	-14.5

Source: Field Survey, April 2024

Field results (Table 2) show that bush meat has the most perceived negative change of about -72.5%, closely followed by medicinal plants (-58.4%) and timber (-57.4%). The negative trend of bush meat revealed by majority of the population was assessed to be attributed to forestland decline. As the forest lands reduce in size, most animals flee into other destinations due to the destruction of their habitats. These include animals that feed on forest fruits and nuts and live only in forested areas. Field investigations further opined that, monkeys, chimpanzees, gorillas and pangolins are the most threatened game species due to forest cover decline in Manjo subdivision. A hunter had this to say at Nsoug village *“hunting no di pay again for here as it been be at first because farmers dem don cut all bush them for here. All grong beef them don run enter for bush for Koupe Manengouba. Even hunter dem don too much for here my pikin. We di just live by the grace of God”*. According to this hunter, the continuous reduction in natural forest lands in the study area has made hunting a challenging activity to those who wholly depend on it for livelihood.

Couple with this forest cover decline, the significant negative trend of timber products was assessed to be due to the absence of reforestation of timber related tree products in the study area. Timber related tree products are exploited and not replanted prior to lack of nursery seeds or plants in Manjo. Some exploiters further complained that the duration of growth for some of timber-based products is also a major challenge, thus contributing to the dwindling of the products in the area. Table 3 further presents the statistics for timber exploited from 2021-2023.

Table 3: Trend of timber products exploited in Manjo from 2021-2023

Year	Number of cars tracked	Number of pieces
2021	12	8723
2022	9	5040
2023	7	4056
Total	28	17819

Source: Field Survey, April 2024; Delegations of Forestry and Wildlife-Manjo (2023)

From Table 3, it can be deduced that there has been a continuous drop in timber-based forest products exploited in Manjo from 2021 to 2023. This result concord with the perceived decline (Table 2) of timber-based products by majority of the population in Manjo Subdivision.

As concerns the negative trend in medicinal plants (Table 2), especially tree barks, it was revealed that most of the trees exploited for timber in the study area are also exploited for medicinal uses. Some of the trees exploited for both timber and medicinal use include *garcinia lucida*, *guibourtia tessmannii*, and camwood and *voacanga Africana* [1]. Felling of these tree products for timber purposes has caused harm to the state of medicinal plants in the study area thus leading to the negative trend of the products. Besides, it was further acknowledged that some of the farmers in the study area do not have adequate knowledge about certain trees exploited for both medicinal and timber purposes. When cutting down the forests for farming, some important tree products are mistakenly felled down thus contributing to a reduction in medicinal plant products.

For stakes, majority of the population (50.4%) had the perception that the products are decreasing in the study area. For instance, it was revealed through field discussions that the decreasing trends in stakes (Figure 12) is mainly inferred to high exploitation due to its high demand in the agricultural domain.

Fig.12: Stakes displayed on sale at Emeng quarter-Manjo



Source: Field Survey, April 2024

The products (Figure 12) are mainly used to stake crops like yams, white and black pepper, plantains and young cocoa in households' farms. Cops like plantains were revealed to be stake to protect them from wind destruction meanwhile yams, white and black pepper are creepers and are stake to facilitate their growth. For young cocoa, stakes are used as signs of identification. This is to avoid destruction of the crop during farm clearing.

Besides stakes, majority of the population (54.2%) also had negative perception on pining poles. It was opined through field discussions that this negative trend in pining poles is resulting from the high used of the products for building construction. The high dependence of the population on pining poles for building construction was further assessed to be resulting from the nature of soils of some villages in the study area. The sandy and rock nature of soils make it difficult for the moulding of blocks which can be used for building construction have pushed many into the exploitation of pining pools for the construction of plank houses (*Karaboat houses*). This is contrary to the negative trend of snails as field discussions opined that the negative trends are resulting mainly from overexploitation due to high demand in the markets.

Equally, field results (Table 2) also showed that forest resources such as wild fruits, vegetables, stakes, pining poles, honey and snails have negative trends. This perceived negative change in wild fruits was also assessed to be resulting from the absence of nursery seeds. For instance, fruit tree products such as *Irvingia gabonensis* (bush mango), *Ricinodendron heudelotti* (njangsang), *Pausinystalia yohimbe* (yohimbe), *Afrostryax lepidophyllus* (Country onion), *Cola lepidota* Schott (monkey cola), *Tetrapleura tetraptera* (four corners), *anacardium occidentale* (cashew) and black were revealed to have no hybrid seeds. It should be noted that not all the fruit tree products are having negative trends in Manjo subdivision. Through field discussions, above 70% of the population had the perception that bitter cola, white and black pepper have positive trends. This perception of the population correlates with the statistics for black/white pepper harvested in-between 2020 to 2022 (Table 4).

Table 4: Trend of *Piper quinensis* exploited in Manjo from 2020-2022

Years	Superficial area (ha)	Estimated outputs (tons)
2020	465	2
2021	485	2.7
2022	-	3.3

Source: Field Survey, April 2024; Delegations of Agriculture and Rural Development-Manjo (2022)

As can be seen in Table 4, there have been a steady increase in the quantity of *Piper quinensis* harvested in the study area. Field findings further opined that the price of this product has also pull many farmers to the cultivation of the product thus leading to an increase in its quantity produce.

In addition to bitter cola, white and black pepper, majority of the population also had the perception that firewood, leaves and charcoal, are having positive changes (Table 2) of about 61%, 38.6%, and 37.2% respectively. The positive changes in fuel wood and charcoal are inferred to the high clearance of the forest lands for agricultural practices. For instance, it was observed that trees felled during the opening of new farms in forested areas are exploited for both fuel wood and charcoal. On the other hand, the perceived positive change in plant leaves is attributed to the high level of cultivation by most farmers. Plant leaves such as *ngongo leaf*, palm and raffia leaves used by the population for thatching and roofing of households homes and farm sties were observed highly cultivated in the study area.

CONCLUSION AND RECOMMENDATIONS

The above investigation has permitted us to draw certain conclusions based on the study objectives, which was to identify and evaluate the trend of forest products in Manjo subdivision.

Firstly, there are several categories of forest products viz; timber, wild ropes, medicinal plants, animal-based forest products, wild plant leaves, palm wine, wild vegetables, fuel wood, wild fruits, pining poles, stakes, snails and honey existing in the forests in Manjo Subdivision. Among these forest products, bush meat, medicinal plants, timber, wild vegetables, stakes, palm wine, pining poles among others were identified to be having negative trends due to green fields decline meanwhile fuel wood, charcoal (resulting from forest clearing for agricultural purposes) and wild leaves have positive trends respectively.

Based on the above observations, the following recommendations are suggested:

1. Research should be carried out on the driving forces of forest lands decline, which was assessed to be one of the major causes of degradation and loss of forest products in Manjo subdivision.
2. The Municipal Council of Manjo in collaboration with local government authorities and institutions should finance research on strategies to improve on hybrid seeds of forest products, and the creation of nursery gardens of forest products, which the population opined as one of the major problems confronting forest resource management in Manjo subdivision.
3. The Municipal Council of Manjo Subdivision in partnership with the local government authorities and institutions should establish a mechanism and develop capacity for carrying out Environmental Impact Assessment on plantation agricultural projects in the area.
4. The Council in partnership with the representatives of the local population (Traditional authorities) and the local government authorities /institutions in Manjo Subdivision should identify and map out the existing natural forest estates and classify them as protected places. Fines should be levied on people who go against this zonation by encroaching into these areas.
5. Government authorities/institutions should conduct permanent surveillance against the encroachment of competing land uses in natural forested areas, especially agriculture. There should equally be the training of agricultural population on agricultural practices that does not jeopardize the sustainability of forest products.

ACKNOWLEDGEMENTS

The authors are indebted to the local population of Manjo Subdivision who gave us valuable information about the types and trend of forest products. We are also thankful to the Delegations of Forestry and Wildlife, Agriculture and Rural Development for their invaluable support in providing the necessary documents for the identification of various types and trends of forest products in Manjo Subdivision. The authors are grateful to the anonymous reviewers for their comments and corrections.

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