

Indigenous Knowledge in Forest Resource Exploitation and Management in Manjo Subdivision, Littoral Region, Cameroon

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ABSTRACT

This study was carried out in Manjo subdivision in the Mungo Division, Littoral Region Cameroon with the main aim of examining the contributions of Indigenous Knowledge Strategies in forest resource management in which the local population depend on their exploitation and use for survival. Data were collected from randomly selected 542 households in nine (9) villages of the study area using semi-structured questionnaires, Focus Groups Discussions, interviews and field observations. The data was further treated using Excel version 2013 and the results presented in the form of tables. Plates were equally taken to portray the field reality. The study results identified about thirty-five (35) types of both wood and non-wood forest products which the local households indigenously exploit and used as sources of food, energy, healthcare as well as materials for carving, weaving, furniture, roofing, and fencing of households homes, farms for security purposes. The study found that these forest products are indigenously conserve through strategies like selective felling, sectional harvesting of tree barks, selective harvesting of leaves, planting, and exploitation of mature trees only, integration of indigenous agroforestry and beekeeping. Despite these available IKS, households still face some challenges such as lack of hybrid seeds (41.7%), the period of growth of some products (35.4%) and the nature of IKS (22.9%) which slow down their conservation and management strategies. The study therefore recommended for the promotion of research on hybrids seeds of forest products.

Keywords: Indigenous Knowledge Systems, Forest Resources management, Manjo Subdivision

INTRODUCTION

Globally, about 300 million of the world population depend on the exploitation of natural resources of the forest sector for subsistence [1]. These forests resources has continue to loss as a consequence of environmental degradation, with commercial and subsistence agricultural practices being the major driver [2]; [3] and [4] cited in [5]. Sustainable management of forests resources is important to food security since mankind rely on for livelihood sustenance [6] cited in [7]. To [8], these forest resources include products such as tree bark, roots, tubers, leaves, fruits, flowers, seeds, resins, honey, mushrooms, fuel wood and timber.

In Africa, majority of indigenous and rural communities depend mostly on indigenous knowledge strategies in the management of forest resources which about 80% of the population depend on for shelter, medicine, rural architecture and engineering for survival [9] and [10]. To [11], forest resource management is referred to as indigenous when they are primarily based on local experience of the specific society and have evolved over time and transmitted from generation to generation by word of mouth or by practice. The knowledge systems has been vital in sustaining forest resources and human livelihoods through practices like the belief in taboos which restrict people from killing totemic animals, hunting, tree felling and the harvesting of forest resources in sacred places [12] and [13]. Through these knowledge systems, the local population has managed to conserve forest resources in places like Tsokoto, Malshegu in Ghana, Binga District, and Arunachal in Pradesh and in Mugabe Area, Masvingo, Zimbabwe [13]; [12]; [14] and [15]. The knowledge

systems varies with different geographical areas and are based on experience acquired through direct contact with the environmental phenomena and observations [16].

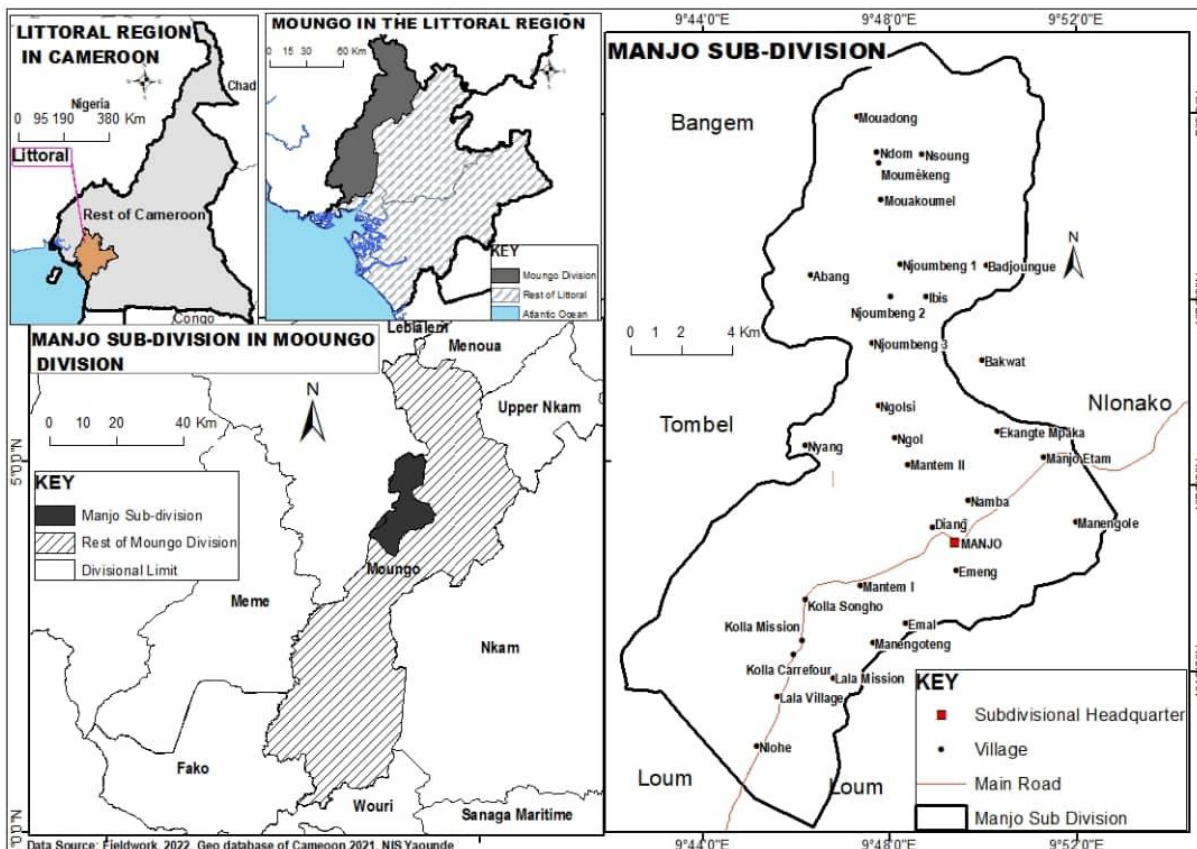
In Cameroon, indigenous knowledge systems are very vital in areas like food crops cultivation and preservation, livestock farming, forest resource conservation and management as well as read weather signs for informed daily and seasonal decisions [17]; [18]; [1] and [19]. The knowledge systems has been used in pest control, healthcare, soil enrichment, erosion control, species selection and conservation and to build resilience against negative effects of environmental dynamics [20]. To [21], these IKS are transmitted and renewed by each succeeding generation, and ensure the livelihood sustenance of the population by providing food security, environmental conservation and sustainability.

Households in Manjo, a subdivision in the Mungo Division of the Littoral Region of Cameroon, depend mostly on subsistence farming and forest resource exploitation for survival. Most of the rural households has historically developed and used indigenous knowledge strategies for the sustainable management of these sectors in order to enhance their wellbeing. The knowledge systems has been widely used in the conservation of forest resources which they rely on their exploitation for building materials, medicine, firewood, carvings among other things for survival. Despite the intensification of these knowledge systems in the area, the local population still encounter enormous challenges in using the knowledge systems in forest resources conservation and management which need a quick solution. However, the main thrust of this research is to assess the IKS in forest resource exploitation and management in Manjo subdivision.

1.1. The study area and methods

1.1.1. The study area: The study area Manjo subdivision is one of the eleven (11) Sub-divisions of the Mungo Division (Figure 1). It is located between latitude 4°48 and 4°50 north of the Equator and Longitude 9°440 and 9°50 East of the Greenwich meridian.

Figure 1: Location of the study area



Source: Fieldwork, 2022. Geo database of Cameroon, 2021, NIS Yaounde

Found to the north-western part of the Mungo Division, Manjo subdivision is bordered in the Northwest by Bangem, in the Northeast by Mount Manengouba, in the West by Tombel, in the East by Nlonako and Nkongsamba, and in the South by Loum Sub-division.

In relation to climate, Manjo subdivision experiences two main seasons. The seasons include: the dry season, generally from November to mid-March and a wet (rainy) season from mid-March to early November. These two seasons in the area have become unpredictable, especially, with vagaries in climatic elements (rainfall and temperature) resulting from the effects of Global Warming. The precipitation range from 2000 to 2500mm with highest rainfall registered in the month of August. The average annual temperatures for the area varies between 26.3 °C to 26.5 °C. The main climatic elements (rainfall and temperatures), in addition to winds, sunshine and humidity of the area, are strongly influenced by altitude, orography and air masses (Trade winds).

With regards to relief, Manjo sub-division covers a superficial area of about 305km² with an altitude that varies between 218-500m in the south and from 2000-2500m to the North. The area is characterised with varied relief features such like plans exploitable for agriculture, steep and gentle slopes, dissected and dry valleys as well as steep mountainous areas such as Manengouba 2400m, Koupé 2070m and Nlonako 1800m that bound the area to the southwest, northwest and northeast respectively.

Considering the vegetation, the subdivision is characterized by dense vegetation cover, secondary forest cover, mosaic mixed tree crops cover, shrubs and gallery forest cover. The dense natural vegetation covers about 79ha in 2020, representing 28.6% of the total surface area. It disseminate over the highlands and steep slopes, marshy lands, accidental steep valleys of the study area such as the high and steep slopes found to the north and north-western parts of Manjo subdivision as well as the hilly tops found to the south western part of Abang village. According to [22], this forests vegetation cover are cornucopia to varieties of forest resources (timber and non-timber (wild fruits, bushmeat, wild vegetables, medicinal plants, fruits, timber, stakes, and leaves) which the population depend on their exploitation for livelihood.

As far as the soil is concerned, [23] revealed that the soils in Manjo subdivision are of volcanic origin very rich in organic material and very fertile. The soils are both azonal and zonal soils. The azonal soils are soils that are form from the breaking down of pre-existence rocks and dead remains of plants and animals. These include alluvial soils in the lowlands, volcanic soils in both the lowlands and highlands, hydromorphic soils found in wetlands. According to [22], these soils found in the area have contributed to the cultivation of different types of crops (maize, cassava, yams, cocoyam, beans, soya beans, bananas, plantains, pineapples, vegetables, groundnuts and pawpaw) which the rural population depend on for livelihood.

In terms of population, the study area is inhabited by several tribal groups. They include: Bamileke, Mbo, Haoussa, Bakaka, Bamenda, Bassa, Diboum, Ewondo, Bororo, and Yabassi. The total population is 40250 inhabitants with 132 hts/ km². According to [22], 70% of this population is made up of the youths with the average age of 24 years.

1.1.2. Materials and Methods: To realised this study, a threefold sampling techniques were applied which involves; simple random, purposive and snowball sampling techniques. The simple random sampling was used to select the households while purposive sampling was applied to select the targeted villages under study. Besides, snowball sampling technique was used to determine the resource persons for the study. A sample of 542 questionnaires was determine from the sample size and administered to the rural households from a total population of 10095 inhabitants [24]. Data from secondary sources was obtained from institutions like the Municipal council and MINADER Manjo as well as from article journals downloaded from online search. The data from primary sources were obtained through interviews, Focus Group Discussions (FGDs) and field observations. Data from primary sources was processed with the help of Excel version 2013 while open questions were sorted and analyzed manually. Cartographic work to carve out the study area was realized with the help of Quantum Geographical Information System (QGIS).

RESULT AND DISCUSSION

2.1. Typology of forest products and exploitation strategies in the study area

2.1.1: Typology of forest products harvested in the study area: The forests in Manjo subdivision are cornucopia to varied forest resources which the local population depend on their exploitation for livelihood sustenance. Table 1 presents the various types of forest products, scientific and indigenous names as well as their various uses in the study area.

Table 1: List of forest resources and uses in the study area

Types	Scientific names	Indigenous appellation	Part	Use
Non-Wood Forest Products				
Raphia bamboo	Raphia	Bah metout	Stem	Weaving, roofing, fencing, crop identification and construction of traditional thatch
Alpine bamboo	Bambusa vulgaris Schrad	Êzongo		
Rattan	Eremospatha laurentii	–	Stem	Weaving
Eru/okok	Gnetum africana	Ekoke	Leaves	Food complement
Mushroom	Amanita muscaria		Body	
Bush meat		Yammehê	Body	
Snails	Snail	Ndonkoh		
Njansang	Ricinodendron heudelotil	Nzizang	Seed grain	Food ingredient
Bush mango	Irvingia gabonensis	–		
Yohimbé	Pausinystalia yohimbe			
Four corners	Tetrapleura tetraptera			
Bush pepper	Piper guineensis	Yop		
Country onion	Afrostryax lepidophyllus	Boulkong		
Ngongo leaf	Thaumatococcus	Meskokol	Leaf	Food wrapping
Palm (wine)	Elaese guinensis	Kemdok	Sap	Drink/medicinal
Raffia wine	Raphia farinifera	Etout		
Cashew	Anacardium occidentale	–	Seed grain	Food
Black				
Moabi	Baillonella toxisperma			
Monkey cola	Cola pachycarpa			
Bitter cola	Garcinia cola	Yina		
Wood Forest Products				
Fuel wood	Fuel wood	Lon	Branches/logs	Source of energy for Cooking, food-drying, warming, roasting and baking
Charcoal	-	Mekanli	Burned wood logs	

Camwood	Baphia nitida	–	Wood logs	Medicinal, furniture and carving
Essok, sok	Garcinia lucida	Ngooh	Barks	Medicinal
Ebom	Prunus africana	–		
Mawum	–	Diwoum	Stem	Building materials, furniture and carving
Ndondo	Melegueta	–	Stems or wood logs	
Voacanga	Voacanga africana			
Black, Aiele	Canarium schweinfurthi			
Matchom	Tetrapleura tetráptera			
Iroko	Milicia excelsa			
Stool wood	Alstonia boonei			
Mahogany	Khaya anthotheca			
Bubinga	Guibourtia tessmannii			

Source: Field Survey, September 2021

From table 1, a good number of forest products are exploited by the local population in Manjo subdivision. The products are exploited and parts use in households as food compliments and ingredients, sources of energy, healthcare, building materials, as well as materials for carving, weaving, furniture, roofing and fencing of households homes and farms for security purposes. The exploitation of these forest products as according to the field results depend largely upon Indigenous Knowledge Strategies.

2.1.2: Forest resource exploitation strategies in the study area: Varied local techniques involved in the harvesting and gathering of forest products in the study area. These include hand picking of fruits with bags and bowls, night gathering, climbing and harvesting, shooting with stones and wood sticks, shaking of tree with hands, hooking with spears, felling of trees, shooting with rubber gun and cutting of leaves with hands (table 2).

Table 2: Local exploitation techniques of forest products

Variables	Scaling (%)				
	SA	A	D	SD	U
Hand picking of fruits with bags and bowls	41.8	24.7	15.1	5.8	12.6
Night gathering of forest products with bags	28.2	43.6	9.8	7.3	11.1
Climbing and harvesting of fruits on trees	43.6	34.5	14.6	5.0	2.3
Shooting with stones and wood sticks	38.0	32.5	10.6	14.4	4.5
Shaking of tree branches with hands	48.9	28.5	10.3	5.5	6.8
Hooking with spears	44.6	21.4	16.9	2.5	14.6
Felling of trees	35.8	29.2	8.1	14.4	12.6
Shooting with rubber gun	45.6	23.4	8.3	14.9	7.8
Selective cutting of leaves with hands	49.9	18.9	11.6	13.6	6.0
Jump and harvesting of fruits or leaves	48.9	27.0	9.6	4.8	9.8
Peeling of tree barks with a cutlass	23.7	42.2	20.9	4.0	9.2

Source: Field Survey, September 2021

From table 2, the local strategies used in the harvesting and gathering of forest products in the study area are manifold. These techniques are used for the collection of forest products like fruits, tree barks, snails and leaves. Field results noted that njangsang, bush mango, bush onion, black and cashew are collected through hand picking while snails’ gathering with bags is carried out during the night. The gathering of snails when night falls is due to the fact that snails move out in the night to feed. In regards to this, most snail gatherers always move out at night with bags and bowls for the gathering. Climbing and harvest of fruits, hooking with spears as well as shaking of the tree branches were also identified as indigenous techniques used in the exploitation of forest products in the study area. These strategies are used for harvesting of forest products such as cola nuts, monkey cola and eru. For peeling of tree barks with a cutlass, this strategy was revealed to be highly used during the harvesting of medicinal plants.

2.2. Indigenous knowledge strategies in of forest resource conservation and management

The indigenous knowledge techniques used by the local population in the conservation of forest resources (table 1) which they depend on their exploitation for livelihood in Manjo subdivision are manifold (Table 3).

Table 3: Indigenous forest resource management strategies

Variables	Scaling (%)				
	SA	A	D	SD	U
Selective tree felling	47.9	33.2	11.6	2.8	4.5
Indigenous agroforestry	51.4	30.7	10.1	3.8	4.0
Sectional harvesting of tree barks	46.6	33.2	9.4	2.3	8.6
Collection of fallen branches and fruits only	46.5	27.1	10.9	8.1	7.4
Felling of mature trees only	44.3	33.4	8.1	6.8	5.4
Selective harvesting of leaves only	32.7	26.4	22.9	8.8	9.1
Picking of ripe fruits under trees only	35.4	30.7	10.1	13.8	10.0
Planting of forest products	37.4	40.5	9.7	5.3	7.1
Beekeeping	40.6	30.2	18.9	6.8	3.6

Key: SA=Strongly Agree, A= Agree, D=Disagree, SD=Strongly Disagree, U= undecided

Source: Field Survey, September 2021

From table 3, several indigenous knowledge techniques were identified during the study to be practice by the local population in the management of forest products in Manjo subdivision. Of these indigenous knowledge strategies use in the study area, indigenous agroforestry (51.4%), selective tree felling (47.9%) and sectional harvesting of tree barks (46.6%) remained the most outstanding while selective harvesting of leaves (32.7%) is the least strategy use by the local population in the conservation of forest resources in the study area. These forest products conserved by the local population are based on their importance to livelihood sustenance as well as the role the products play in the tradition of the people. These results are not in comfirmity with those of [12]; [13] and [25] in which their studies found out that traditional practices (sacred places, taboos, customary laws, totems, sanction and fines) are the Indigenous Knowledge Strategies used by the local population in the management of forest resources in Binga District, Ghana and Busia county-Kenya respectively. These indigenous knowledge strategies in forest resource management are further detail in the following points:

2.1.1. Selective felling of trees: In Manjo subdivision, farming and forest resource exploitation are the main sources of livelihood to the majority of households. Farmers in practicing farming without jeopardizing the sustainability of forest resources used the selective method in felling trees during the clearing of natural forested areas harbouring tree based forest products. This is to make sure that spontaneous tree based forest products are identified and conserved. During clearing, spontaneous tree based products are first of all identified and marked out to avoid destruction during the felling process. These tree based products are identified indigenously through their fallen fruits, nuts, leaves and barks. The trees are further marked out using several strategies which include the cutting of one side with a cutlass, tying of ropes round the trees or putting pegs under trees for easy identification during the felling process. Thereafter, only unimportant plants products are cut down to create space for crops to be cultivated while saplings of these above mention conserved products are allowed to grow freely. This selective method is used by farmers mostly involved in cocoa farming which is one of the main cash crop cultivated in the study area. Field findings revealed that these tree based forest products are not only allowed because of their contributions to households' livelihood but also due to the fact that cocoa needs shelter for its growth (plate 1).

Plate 1: Spontaneous fruits and timber tree plants selectively allowed during forest clearance



Source: Field Survey, September 2021

This selective method is one of the major techniques used by farmers in the study area to conserve spontaneous forest products without necessarily having hybrid seeds for replanting after exploitation. In addition, this strategy is also used to conserve spontaneous vine plants such as mawum and gnetum africana which are also products without necessarily having hybrid seeds as well as Indian and alpine bamboo, bush pepper. It should be noted that among forest products found in the study area, there are products with seeds which can be replanted but will take so many years before attaining the level of exploitation while others take a short period of time to grow to level of exploitation. The local population prefer conserving these spontaneous products through the selective methods especially those that lack hybrid seeds like *Ricinodendron heudelotii*, *Cola pachycarpa*, *Irvingia gabonensis* *Anacardium occidentale*, black, gnetum africana, mawum, *baphia nitida*, *Milicia excelsa*, *Guibourtia tessmannii*, *Swietenia macrophylla* and small

leaf.

2.1.2. Felling of mature trees only: Another strategy used by the local population in the study area to promote the sustainability of trees based forest products especially timber is the selective exploitation of only mature trees at the expense of young growing ones. During the exploitation process for timber, only mature trees are felled down. This is to make sure that the young once should grow to maturity before exploitation. Besides, in order to avoid further destruction during the felling process, some trees are tied with ropes to change it direction when falling. This is done through climbing and tying of the tree top with a rope and with people holding the extreme down which is pulled when the tree is about to fall to change its direction away from destroying other important ones. This is done only when the tree to be cut down is observed to have the risk of destroying other important ones when falling.

2.1.3. Selective harvesting of mature fruits: To further conserve forest products especially wild fruits during the harvesting process, only mature ones are harvested. Hooks tied on sticks and spears are used as harvesting tools in order to avoid the destruction of immature once. For animals’ destruction, scarecrows are used to repel animals from eating up fruits. The scarecrows are mounted on top of fruit trees to scare birds and animals from destruction of fruits since most farms are far-off household’s homes. This involves the tying of sticks on trees and attaching pieces of clothes to resemble human beings to scare birds and animals that feed on these wild fruits trees. The types of animals mostly scarred away include, birds, chimpanzees and monkeys.

Also, field results further posited that, fences, traps and snares are also used as strategies to conserve wild fruits from eating up by animals in the study area (table 3). Fences are constructed round a fruit tree with some few inlets allowed for small games to be able to cross in. Snares and traps are set on the inlet to track down the small games which come to eat up the fruits. These include small games like squirrels, rat moles, monitor lizards, porcupines and pangolins.

2.1.4. Indigenous knowledge in agroforestry: Given the fact that most of the households depend on both forest products and agricultural production for livelihood, majority of the local population has resorted to the practice of agroforestry in the study area as strongly agree by 46.6% of the studied population (Table 3). This agroforestry incorporates the cultivation of both non-forest and forest products (Table 4).

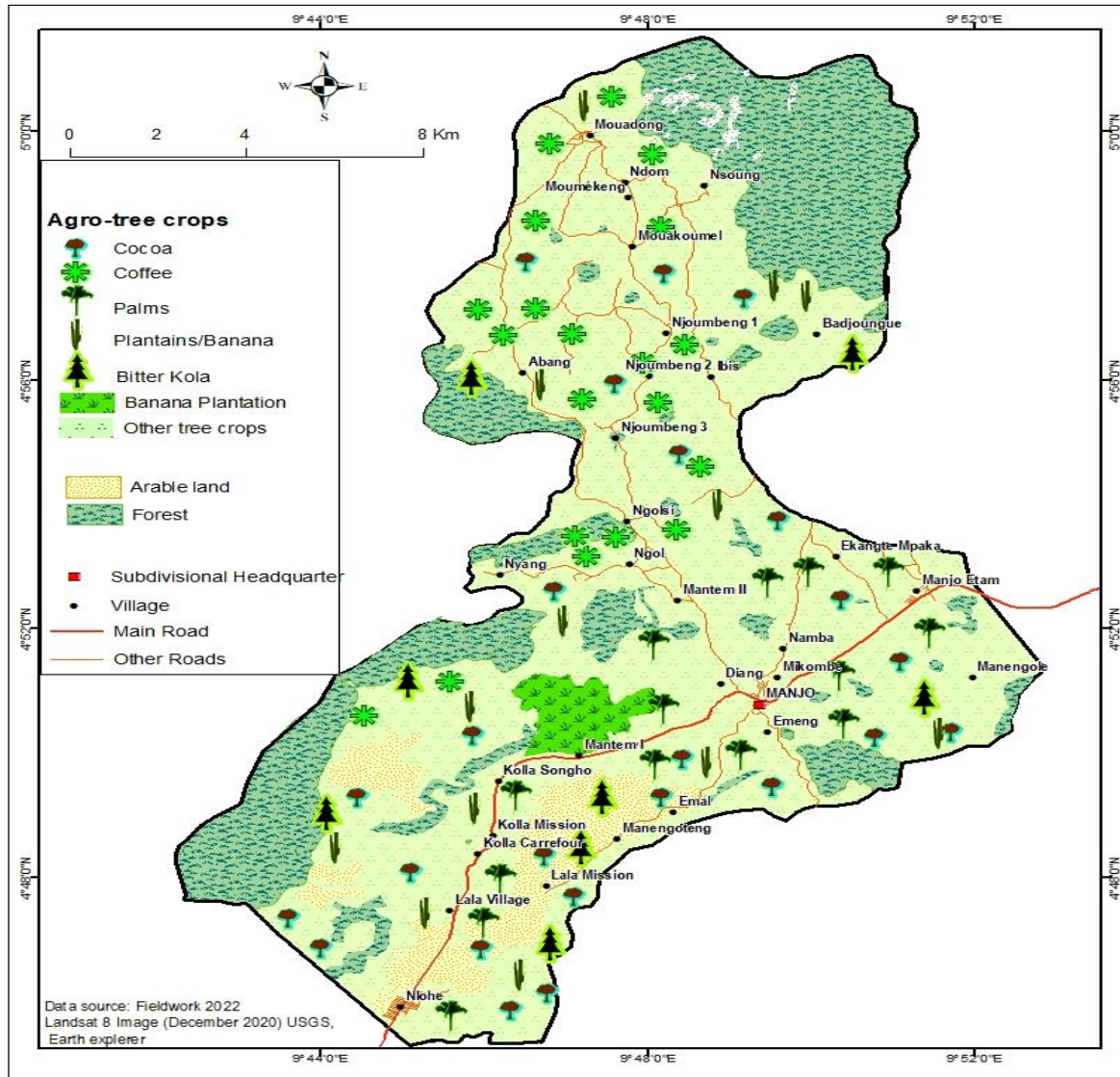
Table 4: Agroforestry systems practice in Manjo subdivision

Forest based agroforestry	Non-forest based agroforestry
Elaeis guineensis	Coffea canephora
Cocos	Theobroma cacao
Prunus africana	Citrus sinensis
Piper guineensis	Pyrus communis
Garcina cola	
Cola acuminata	

Source: Field Survey, September 2021

From table 4, about ten (10) agroforestry systems are practiced by the local population in the study area. Among these include forest based agroforestry which involves the cultivation of forest products such as Elaeis, prunus africana, garcina cola, cola acuminata, cocos, piper guineensis. Non-forest agroforestry systems include Coffea canephora, Theobroma cacao, Citrus sinensis and Pyrus communis. Figure 2 presents the spatial distribution of agroforestry practices in the study area.

Figure 2: Spatial distribution of agroforestry systems in Manjo subdivision



Source: Fieldwork 2022; Landsat 8 image (December 2020) USGS, Earth explorer

From figure 2, forest products conserved through indigenous agroforestry practices include *Garcinia kola*, *prunus africana*, black and white pepper and palms trees which are cultivated in larger quantities. These indigenous agroforestry practices are carried out mostly through the mixed method approach. This constitutes the cultivation of trees based forest products mixed with other trees and food crops in the same piece of land. These include cocoa based agroforestry which is practiced mixed with other fruit trees such as palms, coffee, bitter cola, oranges, mangoes, guava and plume. For coffee based agroforestry systems, the above mention crops are involved in the mixed method approach. Food crops like maize and yams at times are also practice within coffee based forest products.

The conservation of forest products through indigenous agroforestry practices such as *prunus africana*, black and white pepper does not follow the mixed method approach. The population reported that black pepper is a vine plant with many leaves when cultivated on the same piece of land with food crops will destroy them due to thick shelter with limited insolation. They further added that white and black pepper during growing process destroys crops as the plant wrapped down any plant which cannot support its growth.

It should be noted that the conservation of tree based forest products in the study area is fast gaining grounds in the study area due to the intensification of Indigenous Knowledge Strategies in agroforestry practices. Table 5 presents the various forest based products cultivated in terms of surface area covered and quantities.

Table 5: Evolution of forest based agroforestry products in Manjo subdivision

Products	2020		2022	
	Surface Area	Quantity (Tons)	Surface Area	Quantity (Tons)
Elaeis guineensis	403	832	503	930
Piper guineensis	465	–	485	–
Garcinia cola	–	–	–	–
Prunus africana	–	–	–	–

Source: Field Survey, September 2021

As can be seen in table 5, the surface area covered by oil palms increased from 403 in 2020 to 503 in 2022 while the total surface area covered by black pepper increased from 465 in 2020 to 485 in 2022. This shows an improvement on indigenous knowledge in forest resource management in the study area.

Besides, it was also observed during the study that some of the forest products with short-growing period are planted by the population in the study area. These products are either planted in food crops farms or besides households’ homes. Table 6 presents some of the forest based products planted by the local population in the study area and their estimated growth period.

Table 6: Types of forest products planted in Manjo subdivision

Types of products	Scientific Names	Part cultivated	Estimated growth period
Ngongo leaf	Thaumatococcus	Stem	One year
Alpine bamboo	Bambusa vulgaris		Five years
Raphia bamboo	Raphia	Seed/stem	Five years

Source: Field Survey, September 2021

These forest products planting activities beside households’ homes and farms have impacted positively in promoting forest resource sustainability in the study area. Plates 2 and 3 presents some of the forest products planted by households in the study area.

Plate 2: Thaumatococcus planted in a coffee farm at Kolla



Source: Field Survey, September 2021

This particular plant does not produce seeds which can be nursed or planted directly. It is only conserved by the population through the process of transplanting. The product is harvested throughout the year by the population as the products do not actually vary with seasons due to its ability to resist water stress.

Plate 3: *Garcinia lucida* planted beside household house at Ngolsi



Source: Field Survey, September 2021

Plate 3 shows a medicinal plant known as essok “A” planted beside a household house at Ngolsi village. Field findings revealed that this plant is not highly cultivated by the population in the study area due to the time period taken by the plant to grow to majority. The main strategy used by the population to conserve these medicinal plants is the selective method.

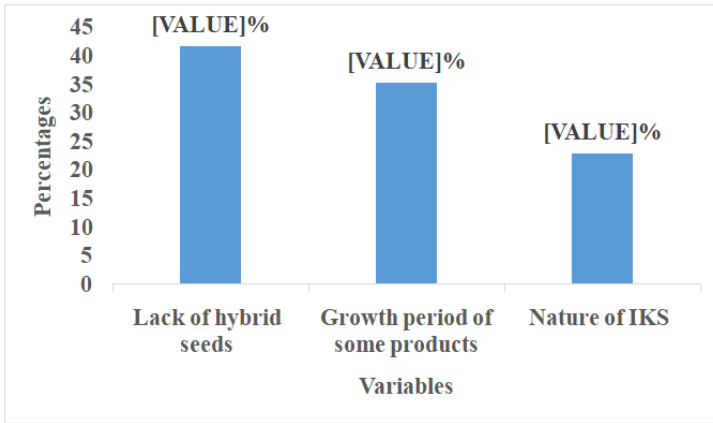
2.1.4. Sectional harvesting of tree barks: Field testimonies revealed that majority of the households in the study area depend on medicinal plants for health care. Some plants are essential components to traditional medicine used by healers and herbalist in the study. The plants are harvested carefully in order not to cause destruction for the tree to dry off. In this regard, the local population has deep knowledge in the harvesting of these medicinal plants. When the leaves or fruits are needed, only the leaves or fruits that are mature are hit with a knobkerrie or local made hock stick to avoid damages. For the roots of the medicinal plants when needed, the population further stressed out that only few roots are uprooted in order not to cause harm to the entire plant. For the medicinal tree barks, only one side is extracted. The types of trees which the barks are exploited for medicinal used in the study area include *prunus africana*, *baphia nitida* and *garcinia lucida*. Field results further revealed that *prunus africana* is in high demanded in the study.

2.1.5 Beekeeping: Beekeeping using fixed comb is an essential part of the livelihood of many households across villages in the study area. The bees’ hives are kept mostly in forested areas. This is to ensure that the bees do not become a nuisance to other people. Beehives fabricated with plank or bamboo and wrapped with grass are mounted in forested areas by beekeepers. In order to attract honey bees into it, honey is applied inside the beehives to attract bees. Besides, beehives are also mounted under or on top of trees that produces flowers with nectar to attract bees into the hives as recounts beekeepers. During the harvesting of honey without causing destruction to the bees since fire is used, a pile of firewood is tied together and fire lighted on it. The smoke and the heat produce by this fire are blown into the beehive to drive the bees to one side for honey to be removed. Only part of this honey is harvested. This is because when all the honey is removed from the bee hives the honeybees can escape from the beehive.

2.3. Challenges of using Indigenous Knowledge Strategies in forest resource conservation and management

About three (3) challenges were identified in the domain of natural resource management of the forest sector using indigenous knowledge strategies in the study area (figure 3).

Figure 3: Difficulties of indigenous forest resource management knowledge in Manjo subdivision



Source: Field Survey, September 2021

One of the main problem household’s faced in using Indigenous Knowledge in forest resource management is lack of hybrid seeds of some forest products. Majority of forest resources which households depend on their exploitation for livelihoods are without hybrid seeds which can be nurse for planting (Table 7).

Table 7: Forest products without nursery seeds conserve through the selective method

Local names	Scientific name
Njangsang	Ricinodendron heudelotii
Bush mango	Irvingia gabonensis
Yohimbé	Pausinystalia yohimbe
Monkey cola	Cola lepidota
Black	–
Essok	Garcinia lucida
Four corners	Tetrapleura tetraptera
Cane	Eremospatha laurentii
Eru	Gnetum buchholzianum
Cashew	Anacardium occidentale
Ayous	Triplochiton sclerxylon
Sapele	Entandrophragma cylindricum
Mawum	–
Bush onion	Afrostryax lepidophyllus
Mushroom	Amanita
Iroko	Milicia excelsa
Camwood	Pterocarpus soyauxiiTaubert.
Mahogany	Kyaya anthotheca

Source: Field Survey, September 2021

As seen in table 7, households revealed that these forest products without hybrid seeds include both timber (mahogany, camwood, iroko, ayous and sapele) and non-timber forest products (njangsang, bush onion, four corners, monkey cola, black, Essok, bush mango, mawum, cane, eru, mushroom and cashew). It should be noted that these forest products are only conserve by households through the none-felling of spontaneous ones during forest clearance for agricultural purposes. In the study area, only villages found adjacent to the forests have access to the exploitation and management of these products since only the spontaneous are protected. For instance, the population further stressed out that when these particular products are transplanted from their original position (from the forest) the product either end up dying-off or take many years before growing to maturity which make some households reluctant using this strategy.

Another difficult challenge in using Indigenous Knowledge Strategies in forest resources management and conservation in the study area is the nature of the knowledge systems. The use of IKS in forest resource management depend mostly upon try-and-error. In managing forest resources, households practiced the try-and-error method through the transplanting of saplings, replanting of seeds picked under tree, cut and plant of stems or tree branches. Besides, the knowledge strategies are not well documented which made it difficult for the youths to learn from them. It was observed from the field that the youthful population are more inclined to the Western Scientific Knowledge Systems due to the absence of IKS in academic curricular as a subject thus leading to degradation and loss of the knowledge systems.

CONCLUSION AND RECOMMENDATIONS

Indigenous knowledge has proven successful in forest resource management and livelihood sustenance of the local population which they depend on their exploitation for several uses [12]. In Manjo subdivision, the local households indigenously depend on the exploitation and management of these products as sources of food, building materials, healthcare as well as materials for carving, furniture, roofing, weaving and the fencing households homes and farms for security purposes. The Knowledge Systems in forest resource conservation and management varies greatly with different types of forest products. Today, some of these forest products in the study area face extinction due to the extensive use of the species, lack of hybrid seeds coupled with the growth period of some of these products which caused households reluctant for their conservation. The inclusion of IKS (Indigenous Knowledge Systems) in academic curriculum and the promotion of research on hybrid seeds of forest products by the Decision and Policy designers will help improve effective forest resource sustainability in Cameroon at large and Manjo subdivision in particular.

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