

**NIGERIAN CONSERVATION FOUNDATION
(NCF)/ROYAL SOCIETY FOR PROTECTION OF
BIRDS (RSPB)**

PARTICIPATORY FOREST RESOURCES MANAGEMENT PROJECT

**A SIMPLE MANAGEMENT PLAN FOR
NGEL-NYAKI COMMUNITY FOREST**

**MAMBILA LOCAL GOVERNMENT AREA
TARABA STATE, NIGERIA.**

FOR THE PERIOD

2008- 2011

BY

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CHAPTER ONE

1.0. BACKGROUND INFORMATION

Sustainable management of renewable natural resources is a challenge to scientists and government at various levels. It has been realized globally that one of the major reasons why sustainable management of forests has remained a mirage is the failure to involve the rural forest communities in planning and execution of forest development programmes. Thus participatory resource assessment and planning has become a veritable tool for sustainable resource management, rural poverty reduction and social development. Furthermore, the last decade has witnessed a rapid increase in interest and activities concerning Non-Timber Forest Products (NTFPs) (Wong et al. 2001). This has in turn propelled interest among conservationists, foresters, development workers and indigenous communities to initiate participatory development/management programmes targeted at promoting NTFPs use and commercialization as a means of improving the well-being of forest edge communities and at the same time conserving existing forests.

It is in realization of this paradigm shift that the Nigerian Conservation Foundation (NCF) in collaboration with the Royal Society for Protection of Birds (RSPB) initiated a participatory forest management project at Buru Community, Kurmi Local Government Area of Taraba State. The success achieved in the first phase of the project has encouraged the organizations to extend the projects to three other community forests in the state. The Ngel-Nyaki Forest Reserve is one of the three new sites. The project came to full fruition when in March, 2006, the communities concerned gave consent to work with the other stakeholders to jointly manage the resources of the forest. This document provides a simple guideline for the sustainable management of the forest.

1.2 SITE DESCRIPTION

Ngel-Nyaki

The forest has been described in details by Chapman and Chapman (2001). The forest is located on the Mambilla plateau which lies to the South-East of Taraba State between Longitude 11°00' and 11°30' East and Latitude 6°3' and 7°15' North. The forest covers an area of about 46km² with an attitude and between 1400-1500m. It was first gazetted as a local authority forest Reserve via the Gashanka-Mambilla Native authority Order of 24 April 1969. it is currently a Taraba State Government gazetted forest.

Climate

The area falls within the South-West monsoon climate. There are two distinct seasons including the rainy season which basis from March to October and the dry season which lasts from November to February. The rainy season is characterized by frequent intermittent rains coming at short intervals. The mean annual rainfall exceeds 1780mm (Iyamabo 1972 in Chapman and Chapman 2001). The rainfall pattern is the characteristic double maxima rainfall of the tropics with peaks in July and September. The dry season starts in November and ends in March.

The terrain of the forest reserve is highly undulating. The landscape is characteristic of the Mambilla plateau. The Mambilla plateau is bounded by escarpment on both its

northern and western sides by steep escarpment occasionally reaching up to 1,070m. The eastern boundary is connected with the Cameroon highlands.

Drainage

The Mambilla plateau is well drained by several streams and rivers which join together to drain into the Benue River. In addition there are a number of water holes at valleys of the many rocky hills particularly during the rainy season. These persist up till dry season. The soil here is partly of volcanic origin and partly of basement complex. Moulid (1980) described the soil as humic ferosol. The soil is mainly silty-loam with pH range 6-5.6. Those derived from the basement complex are with high quartz content and high cation exchange capacity.

Vegetation

The vegetation of Ngel-Nyaki Forest Reserve is a mosaic of grassland dotted at places by forests. The presence of typical rainforest species such as *Pterygota macrocapa*, *Chrysophyllum delvoii* suggest that the place had been exploited before. The activities of shifting cultivators, excessive grazing and annual bush fire must have been responsible for its current status. It is currently comprised of a sub-montane to mid latitude forest.

According to Chapman and Chapman (2001), there are three principal emergent species including *Pouteriaa altissima*, *Entadrophrama angolense* and *Newtonia buchananii*. Portions of the forest still exhibit the three canopy layers characteristic of tropical rain forest viz: the emergent, sub-emergent and the suppressed.

The shrub layer is occupied by, shrubs and herbs. In the grassland portion the vegetation is mainly savanna dominated by grasses interspersed by trees such as *Vitex doniana*, *Hymenocardia acida*, *combretum* species, *Terminalia avicinoides*, *Terminalia glaucens* and *Nauclea latifolia* among others. Grass species and herbs such as *Aspilia africana*, *Panicum anaximum* and *Imperata cylindrica*, dominate the floor.

Ownership

The forest is owned by the Taraba State government. However, present ownership of the forest appears to be a joint stakeholders ownership kind of arrangement with the State government permitting a participatory management approach involving the state Government. The Ngel-Nyaki community and the Nigerian Conservation Foundation. The forest also currently hosts the Nigerian Montane Research Project headed by Hazel Chapman which has been involved in the study of primates, birds and selected tree species in the forest reserve.

Land use types by their areas (Appendix II map)

Ngel-Nyaki forest is divided into three compartments including: Grazing land, Research plots and conservation area for forest conservation.

Farmland

The grazing land is located about 3km radius of the forest Reserve within an area an area of about 2,000 hectares. Here, grazing farming, collection of non-timer forest products such as firewood, medicinal plants firewood and honey, are granted though with control

Forest Conservation Area

This covers an area of about 2 km². The reserved forest is largely mosaic of forest and grass land with narrow strips along the major rivers and valleys of the various hills. Here exploitation activities are strictly prohibited. However pockets of illegal farming and grazing activities are still in practice in this zone. Annual bush burning is another menace seriously affecting the conservation and management of the forest reserve.

The Montane Research Project Area:

This is a strict conservation area comprising of several transects along which studies on animals and plants' behavior are being carried out. The research plots are randomly located to cover the various bio-geographical features of the forest reserve. Any form of exploitation or disturbance is prohibited in this area.

In addition to the above land-use types identified the forest reserve possesses tremendous potentials for ecotourism.

Management Objectives.

The current philosophy on natural resources management is driven by the need to harmonize the goals of the resource owners, users groups and other stakeholders. Such management philosophy is based on the needs and desires of the various groups, organizations and individuals with one interest or the other in the resource concerned. This management plan therefore presents a guideline for harmonizing the various goals of the stakeholders of Ngel-Nyaki Forest reserve in such a way that the ecosystem health and integrity are not adversely affected. Thus the following management objectives were developed by the stakeholders after due consultations among themselves:

- i. to utilize the resources of the forest to the benefit of the communities in a sustainable manner,
- ii to conserve the biodiversity of the forest reserve
- iii to develop the various resources of the forest for economic efficiency
- iv to generate employment to the rural community

Scope of the Management Plan

This plan provides information on the various management activities to be carried out within the Ngel-Nyaki Forest over a period of four years. The management plan is to be implemented by the Forest Management Committee with the assistance of the volunteer forest patrol guards. The local government and the State government are to act only in advisory capacity. Recommendations are made on sustainable off-take levels in respect of selected NTFPs. Similar information on timber products are not provided.

Limitations of the plan.

The plan is limited by paucity of required information for a standard plan. Quantitative information on the yield potentials of the various resources are lacking. Therefore

operational plans are based on quick estimations of standing stocks and their yield potentials.

2.0 STUDY APPROACH/DATA COLLECTION

(i) Participatory Rural Appraisal Survey

This involved on- the- spot assessment of the socio-economic characteristics of each forest edge community in order to dialogue on the community perception and need for the resources of the forest. In each community, the various stakeholders/user groups were identified and invited for a village square meeting during which participants including government forestry staff ,NCF Staff, consultants, village heads, hunters/fishers group, beekeepers group, farmer group and women groups were encouraged to freely express their opinions on the resources available in each forest, their level of availability, the societal demand for them, local traditional taboos governing resource utilization and management, sustainable resource utilization, services peculiar to each community as well as marketable and marketed products in the communities

(ii) Checklist- guided interviews were conducted with the representatives of all stakeholders/users groups. During which specific information on NTFPs occurrence, prevalence, distribution and abundance levels were obtained. In addition, rules, laws and taboos guiding resource administration were also obtained.

(iii) Participatory Resource Assessment

(a) Training of survey team:

A survey team comprising representatives of all user groups/stakeholders was raised in each community for the assessment. During the training, team members were briefed on the mission of the assessment survey, the kind of information required and the survey procedure.

(b) Field Survey/Assessment

Sampling Design: Segmented belt transect technique was adopted for the field assessment.

Sampling procedure

In each forest, 250m line transect was cut and five 20 x 20m quadrants were located on either side of the transect. 1 x 1m plots were located on the four corners of each 20 x 20m quadrant. Within the 20 x 20m quadrants, a complete enumeration of all trees above 10cm dbh was carried out. Trees were identified to species level and recorded. NTFPs including smaller trees, herbs, mushrooms, etc were enumerated within the 1 x 1m plots. Members of the community identified the species used by them, gave the local names and the purpose for which they are used. In addition, selected group of knowledgeable members of the different user groups were asked to scout round the forest and collect samples of all plant materials useful to them in one way or the other and bring them to the camps where they were jointly identified by the survey team.

In addition to direct field observations, information on wild life species found in each forest was also gathered using Rapid Rural Appraisal Technique . Experienced hunters

from each community were asked to indicate animals and birds known to be present in each forest by showing them photographs of such animals and birds presented in field guides such as *Gashaka- Gumti National Park: A Guide Book*, By Andrew Dunn (1991) and *An Introduction to Birds of Nigeria* By Anne Nason (1992)

(iv) Post Assessment Feedback Meeting

For each of the communities a post field- assessment meeting was held to further dialogue with the community members. The people were asked to comment on their experiences on the field and provide further information on resource utilization in addition to what they gave initially. The results of field assessments were discussed and those NTFPs of very important commercial and utilitarian values were identified for further studies on their development potentials, value addition and marketing strategies.

Status of the Growing Stocks

Presently, the forest reserve is composed of both timber and non-timber forest produce. The fulcrum of this plan is sustainable livelihood development and forest ecosystem health. As a result, the plan shall depend so much on the resources within the forest which are capable of improving the livelihood of the people while ensuring that the potential of the forest to contribute to future development is not jeopardized. Appendices III - VII provide detail information of the various forest produce available in the forest.

The Action Plan.

The next section presents an action plan comprising of series of activities to be carried out in the forest reserve within the planning period (2008-2011). The activities include those to be carried out both at the farmland and the conservation area. The activities are carefully arranged such that they could be sequentially implemented though adjustments may be made based on current needs and realities on ground at a given time. Further details and activity –time- lines are provided in the annual work plans of operations which are also provided for each of the forest compartments. The manager will note that the activities follow definite time pattern which may be followed throughout the year. As in the case of the work plan however, it is not a rigid rule and therefore is subject to adjustments as necessary.

4. ACTION PLAN 2008 -2011

COMPARTMENT 1: NGEL-NYAKI FARMLAND AREA: 2KM²

MAIN OBJECTIVES: Sustainable land use and livelihood development within the support zone through arable and cash crop farming, collection of NTFPs, fuel-wood for domestic use, poles, ropes and grasses for thatching.

Community involved:

S/N	2008	2009	2010	2011
1	Detail boundary survey of farmland Area	Training on domestication of bush meat species	Enrichment planting of selected valuable species	Boundary cleaning/maintenance
1.2	Mapping of the farmland area	Training on homestead fish pond management	Collection of selected NTFPs	Timber/poles harvesting
1.3	Site selection for community nursery	Training on development potentials of selected NTFPs	Harvesting of domesticated bush meat species	Collection of NTFPs
1.4	Training on community nursery establishment and management techniques	Provision of current marketing information on selected forest products	Cropping of homestead fishponds	Crop production
1.5	Collection of seeds for nursery establishment	Maintenance of community nurseries	Collection of seeds for community nursery production	Cropping of homestead fish ponds
1.6	Establishment of community nurseries	Enrichment planting for selected species	Nursery maintenance and rejuvenation for seedling production	Crops production
1.7	Farming activities	Farming activities	Farming activities/ establishment /expansion of existing community nurseries	Enrichment planting
1.8	Allocation of hunting quotas	Hunting	Honey harvesting	Honey harvesting
1.9	Honey production and harvesting	Timber and poles harvesting	Collection of NTFPs	Commencement of non-timber forest products development programme.
1.10	Timber and poles harvesting	Collection of NTFPs	Further training on NTFPs development	Outreach campaign programmes for project support
1.11	Collection of NTFPs	Training on value addition/development techniques for selected NTFPs	Project review meeting	Trips by selected community representatives to other locations where CBFM has succeeded within and outside Nigeria.
1.12	Training of volunteer local forest guards	Mid –term project review	Stakeholders meeting.	Project evaluation and review exercise

COMPARTMENT I1: NGEL-NYAKI FOREST CONSERVATION AREA

AREA: ? KM²

MAIN OBJECTIVES: Conservation of flora and fauna biodiversity and sustainable production and utilization of forest resources for community livelihood and development..

Community involved : NGEL-NYAKI

S/N	2008	2009	2010	2011
1	Detail boundary survey of forest conservation area	Maintenance of forest boundaries	Boundary cleaning / maintenance.	Boundary cleaning/maintenance
1.2	Mapping of the forest conservation area	Singling and freeing of seedlings	Collection of selected NTFPs	Regular boundary patrols
1.3	Boundary cleaning and regular patrols	Maintenance of access roads	Supply of seeds to community nurseries	Supply of seeds to community nurseries
1.4	Development and maintenance of access roads and bridges	Controlled harvesting of timber and poles for domestic uses	Nursery maintenance and rejuvenation	Nursery maintenance and rejuvenation
1.5	Harvesting of timber and poles for domestic use	Production and marketing of non-timber forest products	Enrichment planting of selected valuable species	Harvesting of timber/poles for domestic uses
1.6	Controlled hunting of selected bush meat species	Enrichment planting for selected species	Maintenance of access roads	Singling and spot weeding for seedling regeneration
1.7	Fire tracing of the forest conservation areas	Controlled hunting	Controlled harvesting of timber and poles for domestic uses	Enrichment planting
1.8	Identification of suitable areas for hive installation	Maintenance of bee hives	Honey harvesting	Maintenance of access roads
1.9	Installation of bee hives	Honey harvesting	Controlled hunting and fishing	Maintenance of bee hives
1.10	Honey harvesting	Maintenance of regeneration	Processing and marketing of selected NTFPs	Honey harvesting
1.11	Sport weeding to encourage regeneration of wildlings.	Project review meeting	Regular patrol of forest boundaries	Controlled hunting and fishing
1.12	Seed collection for community nurseries	Mid –term project review	Trips by selected community representatives to other locations where CBFM has succeeded within and outside Nigeria.	Performance evaluation and review of 2008 management plan

Recommended off- take levels for selected Non-Timber Forest Products within the Forest Reserve

S.N.	Species Name	Local Name	Part(s) used	Present status	Recommended off-take level(%)
1	<i>Pipper umbelatum</i>	Yaji	Leaves, flowers,	abundant	30% of leaves
2	<i>Zanthoxylum. zanthoxylloides</i>	Yaji	Root stem back	frequent	10% of back
3	<i>Garcina manii</i>	Mijingoro(Ha)	root	frequent	5% of roots
4	<i>Garcina kola</i>	Mijingoro(Ha)	Seed/stem back/root	frequent	95 % of fruits produced
5		Biro(Fu)	Leaves	abundant	30% of leaves
6	<i>Entandrophragma angolense</i>	?	Stem back	frequent	5% of back
7	<i>Commelina erecta</i>	?	leaves	abundant	75% of stock
8	<i>Terminalia avicinoides</i>	kulahi (Fu)	Leaves , stem.back, ,root	abundant	10% of stock
9		Chita (Fu)	Leaves, stem back	abundant	25% of leaves
10	<i>Sida acuta</i>	Seldori	Leaves, stem back	abundant	5 % of stem back
11		Samaile(fu)	Stem back	occasional	5% of stem back
12		Karki(Fu)	Stem, root	Occasional	10% of stock
13	<i>Occimum sp</i>	Kilare(Fu)	leaves	abundant	30% of leaves
14	<i>Entanda abysinica</i>	Pelwahi(Fu)	Fruit,stem back	frequent	95% of fruits produced
15	<i>Ficus spp.</i>	Ebbe(Fu)	Fruit	frequent	95% of fruits produced
16	<i>Syzigium macrocarpa</i>	Sikakondo(Fu)	fruit	frequent	95% of fruits produced
17	<i>Emilia cocinea</i>	?	Stem , leaves	abundant	10% of standing stock
18	<i>Dombeya sp</i>	Dalamhi (Fu)	Stem back	abundant	5% of ste back
19	<i>Bryophyllum pinatum</i>	?	leaves	abundant	25% of leaves
20	<i>Bridelia speciosa</i>	Burunburu (Fu)	Stem	abundant	10% of stock
21	<i>Vernonia amygdalina</i>	Suaka (Fu)	leaves	frequent	25% of leaves
22		Walasama (Fu)	leaves	frequent	25% of leaves
23	<i>Crotalaria sp</i>	Biralahi (Fu)	leaves	frequent	25% of leaves
24	<i>Vitex doniana</i>	Ngalbije (Fu)	Leaves, fruits, stem, stem back	abundant	95% of fruits produced
25	<i>Phoenix reclinata</i>	Darle (Fu)	Latex,stem, fruit	frequent	10% of stock
26	<i>Syzigium guineensis</i>	Tsomsom (Fu)	fruit	occasional	95% of fruits produced
27	<i>Landolphia</i>	Bel bel (Fu)	fruit	frequent	95% of fruits produced
28	<i>Psorospermum sp.</i>	Sawaike (Fu)	Leaves,stem back	frequent	25% of leaves
29	<i>Appis spp.</i>	Zuma(Hausa)	Jelly	Potentially abundant	100% of capped hives
30	?	Gadelade(Fu)	fruits	occasional	95% of fruits produced

It should be noted that the off-take levels recommended are based on the nature of products (e.g. 10% for complete tree removals 25 % for leaf harvest and 95% for fruits and seeds) and their present ecological status within the forest.

The determination of sustainable off-take is based on the result of the participatory assessment. For non-timber forest produce with long gestation periods and for those whose parent plants have to be removed in the process of harvesting, an estimated 10 % annual off- take is recommended. This is based on the assumption that the growing stock will be harvested over a period of 10 years thereby giving ample opportunity for regeneration to harvesting stage and ensuring a constant stable annual yield. This is the case with NTFPs such as cattle sticks (*Capolobia* spp) and chewing sticks (*Massularia acuminata*) where harvesting entails total plant removal. For fruit trees, such as bush mango (*Irvingia* spp) and bitter kola (*Garcina* spp), at least 5% of the annual fruit production should be left on the forest floor for subsequent years' regeneration. It should be noted that the assessment was done only once, and therefore the off-take recommended are based mainly on quick estimation only for the purpose of providing a management guideline. A more reliable estimate is possible but this will require at least three consecutive years' surveys of yield and harvests. Medicinal plants harvesting should be restricted to farming areas only except for some very rare species which may be found only in the forest conservation areas. In such cases, bark peeling and root digging should be discouraged. In order to ensure that the community will continue to have access to such vital materials however, enrichment planting should be encouraged around the farming and homestead areas. Selected wildlife species particularly duikers are currently hunted for their meat and skin. This holds good promise for protein and supplementary income. However harvest rate should be pegged at 10% implying that one animal out of every ten is harvested. Furthermore, juveniles and pregnant females should be spared.

ANNUAL PLAN OF OPERATIONS COMPARTMENT I: NGEL-NYAKI FARMLAND AREA.

	OPERATIONS	LOCATION	PERSONS/ GROUPS RESPONSIBLE	J	F	M	A	M	J	J	A	S	O	N	D
1	Detail boundary survey of farmland Area, Production of detail map of the farmland area.	Perimeter of the farmland area	Farmers group, volunteer forest guards, representatives of traditional chiefs and other users groups.												
2	Mapping of the farmland area	Farmland area	Expert /consultants, representatives of the various users groups and volunteered forest guards.												
3	Construction and maintenance of access roads /Site location for community nursery	Around the communities and within the forest	Local Government, community based organizations												
4	Trainings on various skills: community nursery establishment, domestic bush meat production, vegetative propagation techniques, homestead fishpond management, honey production, Development and marketing potentials of selected NTFPS	Ngel-Nyaki community	Fishers group, Hunters group, women group farmers group coordinated by NCF												
5	Collection of seeds for nursery establishment	Farmland area and conservation area	Youth, women group, hunters group												
6	Establishment of community nurseries &Enrichment planting	Farmland area	Framers group, volunteer forest guards.												
7	Crops production and harvesting	Farm land area	Framers group, women group, youths, Hunters group												
8	Allocation of hunting quotas	Farm land area	Community forest management committee with the supervision of NCF Staff												
9	Honey production and harvesting	Farm land area	Bee keepers group												
10	Timber and poles harvesting	Farm fallows and free area	Volunteer forest guards												
11	Collection of NTFPs	Farm fallows and free area	Women group, hunters, group and farmers group, beekeepers group												
12	Training of volunteer local forest guards	Ngel-Nyaki community	Experts/ consultants , NCF staff and Taraba State Forestry Department												

ANNUAL PLAN OF OPERATIONS

COMPARTMENT II: NGEL-NYAKI FOREST CONSERVATION AREA

	OPERATIONS	LOCATION	PERSONS/GROUPS RESPONSIBLE	J	F	M	A	M	J	J	A	S	O	N	D
1	Detail boundary survey of forest conservation area, mapping, Boundary cleaning and fire tracing	Perimeter of the Forest conservation Area	Farmers group, volunteer forest guards, representatives of traditional chiefs and youths	█	█	█								█	█
2	Construction and maintenance of forest roads and bridges	Within and around the forest conservation area.	Farmers group, volunteer forest guards, representatives of traditional chiefs and youths	█	█	█	█							█	█
3	Seed collection for community nurseries	Forest conservation area	Women and children	█	█	█								█	█
4	Development and maintenance of access roads and bridges	Ngel-Nyaki community	Farmers group, volunteered forest guards, representatives of traditional chiefs and youths	█	█									█	█
5	Massive reforestation	Forest conservation Area	Taraba State government, Farmers, group, hunters group and volunteered local forest guards	█	█	█	█							█	█
6	Maintenance of plantations	Forest conservation Area	Farmers group, hunters group volunteered forest guards, representatives of the youths supported by Local Government and NCF				█	█		█	█				
7	Enrichment planting of selected species.	Forest conservation area	Farmers group, volunteered forest guards, representatives of the youths						█	█					
8	Controlled hunting and fishing	hills and rivers and streams	Hunters group, farmers group, fishers group and volunteered community forest guards.	█	█	█								█	█
9	Honey production and harvesting	Periphery of forest conservation area	Bee keepers group, volunteered community forest guards	█	█	█	█							█	█
10	Regular patrols of forest boundaries	Immediate surroundings of the of the forest conservation zone	Volunteer community forest guards supported by representatives of the youths	█	█	█	█							█	█
11	Collection of selected non-timber forest products	Within and around the forest conservation area	Women group, farmers group and hunters group.	█	█	█	█	█	█	█	█	█	█	█	█
12	Review of 2008 forest management plan	Ngel-Nyaki	Representatives of all stakeholders	█	█	█									

Justification for the recommended activities and their Timing

1. Boundary surveys, demarcation and mapping of the various land use types. This is essential to assist planners to know the extent of the estates and to minimize inter-communal feuds resulting from land disputes. Regular boundary cleaning will also prevent fire hazards. This is best done during the dry season when accessibility is easier and more importantly farming activities are at low ebb. This is to ensure that all members of the community have the time to support the operation.
2. Construction and maintenance of roads, rides and bridges. This is the collective responsibility of all stakeholders. The assistance of Local and State governments is very important in this regard particularly on construction of bridges and opening up of the roads. The job is best done in the dry season when the soil is dry and allows for easy working and when farm activities are light, thus ensuring that community members can be available to participate in the operation
3. Regular patrol of the boundaries and entire forest. This is the responsibility of the volunteer local community forest guards. It is to be done at least twice every month to check illegal harvesting and potential encroachment of the forest.
4. Trainings in nursery production, vegetative propagation techniques, products development, domestic bush meat production, apiculture and homestead fisheries management technologies: this is to equip the community members with the necessary skills to produce some of the produce of the forest within their vicinity. This if successfully done, will supplement the harvests from the forest and relieve the forest of human pressures. All user groups are to benefit from at least one of these training programmes. The trainings, (except vegetative propagation techniques which is best done during the raining season) are recommended to be mounted during the dry season when farm activities are light.
5. Establishment of community nurseries. This is necessary to produce seedlings of some selected species (eg *Ashanga*, *Achi* and *Ogbono*) for enrichment plantings particularly in the farmland areas in order to relieve the pressures on the natural stands within the core forest areas. Seed collections should start from October and continue through March to ensure that mature and healthy seeds are collected. Nursery establishment should start from January to get the seedlings ready for planting out in June/July. Women are known to be good in nursery care and they may have time to carry out routine nursery maintenance work
6. Harvesting of timber and poles for domestic use: community members require lumber and pole for construction of new houses and maintenance of old ones. Timber and poles harvesting should be done during the dry season and restricted to farmland areas. Community members engage more in building construction and maintenance during the dry season in order to forestall possible leakage during the rainy season. This is also done in the dry season when they are a bit free from farming activities
7. Spot -weeding, singling and freeing to encourage wildling regeneration: this involves ring weeding around the naturally growing wildlings to encourage regeneration. This is to be done during the rainy season when there is severe competition from unwanted plants and when thinned plants will benefit from

- enhanced growth environment. This to be done by the framers group supported by the volunteer forest guards.
- 8.** Harvesting of Selected non-timber forest produce: this is to be done all year round because community members rely on them for their livelihoods. Women should participate actively in this activity
 - 9.** Controlled hunting and fishing: to be done with strict supervision and during the dry season when water levels are low, forest is more accessible and farm works are light. Hunters and fishers groups are directly involved though other members of the community may participate for subsistence hunting and fishing.
 - 10.** Honey production and harvesting .Though honey production could be done all year round, it is better done during the dry season when nectar is available and accessibility is better. This is to be done mostly by bee keepers group
 - 11.** Farming activities: framing activities take place throughout the year but they are more intensive during the rainy season. So enough time should be available to farmers for land preparation, planting and farm maintenance during the rainy season starting from March through October. All community members are involved in framing though framers groups are naturally more concerned.
 - 12.** Review/Evaluation of the management plan. This comes up during the last quarter of 2011 and it concerns all stakeholders. This is to evaluate the performance of management within the planning period, identify weak points and successes in order to assist in planning the next phase.

Strengths Weaknesses, Opportunities and Threats (SWOT) for Various Activities Recommended

This section presents an analysis of the various biological, socio-economic and anthropological factors which affect the sustainable management of the forest.

Activity	Strengths	Weaknesses	Opportunities	Threats
Detail boundary survey & mapping to show the various land use types.	Enhanced planning with certainty.	Potential boundary disputes	Community good -will. Availability of labor	Rugged terrain. High cost of Survey
Construction and maintenance of access roads, rides and bridges	Improvement in accessibility of both the community and the forest.	Exposure of the forest to illegal activities	Rural employment, enhanced market.	Cost of road construction
Regular patrol of the boundaries and entire forest	Resource protection assured.	Rugged terrain Poor accessibility	Sustainability of resources. Reduced risks of fire outbreaks and other forest offences	Poor legal provisions for law enforcement
Trainings in nursery production, vegetative propagation techniques, products development, domestic bush meat production, apiculture and homestead fisheries management technologies	Enrichment of natural stocks. Production of vital resources outside the conservation area	Inability to adopt and utilize the skills acquired.	Veritable source of rural income outside conservation area. Pressure relief on the natural stocks. Rural livelihood support	Initial cost may be high
Establishment of community nurseries.	Availability of planting stocks for enrichment planting	Reluctance to reserve /sacrifice valuable seeds for sowing	Provision of rural employment	Lack of seeds
Controlled hunting and fishing	Sustained harvesting	Difficulty to keep harvest at sustainable levels. Poor enforcement of regulations and controls.	Sustained supply of animal protein.	Illegal harvesting. Use of unsustainable harvesting methods e.g. poisoning of water

				bodies, killing juvenile and pregnant animals
Spot -weeding, singling and enrichment planting to encourage seedling regeneration	Enrichment of natural stocks. Improved productivity	Bias against some species may negatively impact biodiversity conservation	Sustainability of valuable species ensured. Availability of important resources in desired quantity and frequency	Undue ecological advantage to the few selected species. May affect biodiversity conservation
Harvesting of Selected non-timber forest produce	Compatible with biodiversity conservation. Minimal negative impact on residual stocks	Inability to keep harvest at sustainable levels only	Enhanced rural livelihood	Poor marketing facility Gross undervaluation and under utilization. Limited knowledge on Value addition. Unsustainable harvesting. Possible local extinction of selected species.
Harvesting of timber and poles for domestic use.	Demand is within sustainable limits. Current pressure is low	Potential damages to non-target species. Inefficient utilization due to lack of knowledge on processing techniques	Supply of wood for buildings and other utilities	Over-harvesting in future as commercialization sets in.
Farming activities.	Availability of fertile arable land. Availability of farm labor	Forest encroachment. Deforestation for farming	Food supply to rural community.Provision of rural employment Stabilization of rural population	Conflicts among conservationists,farmers and grazers
Training of volunteer local forest guards	Resource security better ensured	Inability to adequately equip and remunerate the guards	Availability of willing young members of community	Weak legal provision to adequately prosecute and punish offenders. Lack of patrol facilities
Review of management plan.	Some base-line information already established in current plan. Desirable for sound planning	Inability to fund a sound management plan	Preparedness of the various stakeholders to support	Scarcity of requisite information for sound management planning

APPENDIX I : CONSTITUTION AND BYELAWS OF NGEL-NYAKI COMMUNITY DEVELOPMENT COUNCIL

- 1.0 **NAME OF ASSOCIATION:** The Council hereby created shall be known as the Ngel-Nyaki Community Development Council (BCDC) and is established in Nigeria as a self help community based organization (CBO) with the objective to ensure the conservation of the community biodiversity and sustainable use of renewable natural resources for the benefit of all the community members and humanity in general.
- 2.0 **OBJECTIVES:**
- 2.1 Maximize the contribution of renewable natural resources to livelihood of Ngel-Nyaki Community members.
 - 2.2 Work with wild resources, which are most important for poor and vulnerable people to ensure self reliance.
 - 2.3 Acquire the necessary skills to manage renewable natural resources
 - 2.4 Acquire methods of problem analysis that can be applied to day to day issues to improve the living standard of member of the group.
 - 2.5 Become strong, viable organization able to address problems which individuals cannot tackle alone.
 - 2.6 Become credible and able to attract financial and technical support from relevant development aid and Government agencies.
 - 2.7 Increase the capacity of the group to organize them and effectively control their resources.
 - 2.8 Work in collaboration with FMC and handle any problem FMC cannot.
- 3.0 **POWERS**
- a. In furtherance of the said objective the Association may collaborate and/or affiliate with national and international organizations such as the Nigerian Conservation Foundation or other National and International Organizations with similar objectives.
 - b. Empowerment of members for self sustenance and self actualization.
 - c. Carry out community/self help projects.
 - d. Seek financial and technical support from donor and government agencies, both locally and internationally.
 - e. Embark on income generating activities (IGA) that are environmentally sound.
 - f. Ensure feedback of the association activities to the larger Ngel-Nyaki community
 - g. Collect funds, receive subscriptions, levies, royalties, fees, allowances and bequests and acquire income by selling products and other items.
 - h. Engage in publicity in order to promote general awareness of its objectives activities.
 - i. Organize training, lectures, conflicts resolution, monitoring and evaluation of renewable natural resources, meetings and discussions in furtherance of its objects and source financial assistance in this respect.
 - j. Engage in sustainable management/sustainable utilization of renewable natural resources (RNR), using agreed RNR action plan.
 - k. Negotiate and co-operate with FMC, Government and public bodies in the interest of conservation of natural resources.

- l. Lend, put out at interest, invest or reinvest any monies not immediately required on such conditions as may be considered necessary from time to time.
- m. Open and operate bank accounts.
- n. Obtain or borrow money or guarantee payment of any amount in any manner and on such conditions as the group may deem suitable in promoting its objectives.
- o. Enter into agreements and contracts;
- p. Sign and execute deeds and undertake or execute any representation or trust.
- q. Employ the money and property of the group in the promotion of its objectives.
- r. Act in any other legitimate manner in order to realize its objectives.
- s. Do all such other acts, deed and things as may be incidental or conducive to the objectives of the Association.

4.0 **MEMBERSHIP**

- 4.1 All adult (male and female) members of Ngel-Nyaki community (including the settlers in the associated settlements in Ngel-Nyaki o) are members of the association.

4.2 **EXECUTIVES**

Members are the heads of village heads of communities and enclaves of the forest reserve , 2 representatives each of all the user groups in Ngel-Nyaki; namely women group (2), bee keepers association (2), hunters (2) and agricultural cooperative (2) and 2 representative of the pressure group (forest agricultural guards) in Ngel-Nyaki. Others include 2 representatives of health committee, and education committee.

4.3 **EXECUTIVE MEETING ATTENDANCE**

- 4.2.1 Late coming to meeting will attract a fine of fifty naira.
- 4.2.2 Non attendance at meetings will attract a fine of one hundred naira and when a member absent himself or herself for 3 consecutive meeting without any cogent reason he or she will be given warning and if this persist the member will be expelled.
- 4.2.3 Stealing/or membership of secret cult(s) shall lead to instant expulsion without benefit of warning.

5.0 **ELECTION**

5.1 **PROCEDURE**

- 5.2 Officers shall be elected except the Chairman who will be the village head.
Other officers shall be elected, by a simple majority during a properly constituted general meeting of the association.

5.2 **TENURE OF OFFICERS**

- 5.2.1 Elected Officers shall act for a period of two years.

5.3 **ELIGIBILITY**

Any member seeking any elective post in the Executive Committee must:

- 5.3.1 Be an active member of the committee

5.3.2 Have attended at least 75% of the meetings prior to the time of election.

6.0 OFFICERS

6.1 Chairperson

The Chairperson's responsibilities shall be:

6.6.1 To summon, chair and conduct meetings

6.6.2 Be a signatory to the group's account

6.6.3 To represent the committee at external fora

6.6.4 To ensure proper feedback to and from the larger community, regarding the committee's activities.

6.2 VICE-CHAIRPERSON

The Vice-Chairperson shall conduct the duties of the Chairperson in the absence of the Chairperson.

6.3 SECRETARY

The Secretary shall perform the following functions:

6.3.1 Summon meetings as directed by Chairperson

6.3.2 Record meeting proceedings

6.3.3 Keeps all the Committee records

6.4 ASSISTANT SECRETARY

He/She deputizes for the secretary in the absence of the secretary

6.5 P.R.O

The P.R.O shall perform the following functions:

6.5.1 Mobilize members for meetings and other activities

6.5.2 Ensure proper dissemination of information regarding the activities within and outside Ngel-Nyaki community.

6.6 TREASURER

The treasurer shall perform the following functions:

6.6.1 Keep and disburse fund as directed by the executives

6.6.2 Keep the association passbooks/cheque books

6.6.3 Shall be signatory of association

6.6.4 Shall be signatory of Association's Account

6.7 FINANCIAL SECRETARY

The Financial Secretary shall perform the following functions;

6.7.1 Collect all dues

6.7.2 Keep records of all financial transactions of the Association

6.7.3 Signatory to the association Account

6.8 AUDITORS I & II

Responsibility will include

6.8.1 Check the books of the financial secretary and treasurer as he or she deem fit

6.8.2 Give audit report to the house every quarter

7.0 EX-OFFICIAL MEMBERS

These shall be representatives of donor, local government or state government. Their numbers shall not be more than 3 at any given time; their function shall be restricted to:

- 7.1 Facilitation of the association activities and programs
- 7.2 Advisory

8.0 MEETINGS

8.1 **General Meetings:** Chairperson shall call general meetings at least twice in a month in which all community members shall attend.

8.2 **Annual General Meeting:** The Chairperson shall convene an Annual General Meeting at least once in a year.

8.3 **Emergency Meeting:** The Chairperson shall summon an emergency meeting if requested by at least 1/3 of the executive members.

8.4 **Executive Committee Meetings:** The Chairperson shall call an Executive Committee Meetings at least twice in a month before any General Meeting and the quorum for such a meeting shall be at least simple majority.

8.5 **Quorum at Meetings:** The quorum for all meetings except Executive Meetings shall be one third of members, with fractions rounded to the nearest whole number.

8.6 **Penalty for non-attendance at Executive Meetings:** Defaulter shall be made to pay a monetary fine. Amount to be determined by the house at the meeting.

8.7 **Penalty for later Coming to Executive Meeting:** Defaulter shall be made to pay a monetary fine. Amount to the determined by the house at the meeting.

9.0 SUB-COMMITTEES

The group shall set up various sub-committees (Harvesting Committee or Sales Committee) to ensure proper functioning of the committee/association as the need arises.

10. FEEDBACK

10.1 Activities of the committee/Association shall be open:

10.2 The Association shall regularly inform the elders and the youths about the committee's activities through meetings and discussions.

11. AUTHORIZED SIGNATURES

The Chairperson, the Treasurer and the Group Secretary shall be the authorized signatories to the group account. The Chairperson has to counter sign any cheque to make it valid.

12. DISSOLUTION OF THE GROUP

The Association may be dissolved if for any reason whatsoever it is no longer able to fulfill its objectives. Upon dissolution, the property and assets of the Association shall be transferred to the Ngel-Nyaki Community.

APPENDIX II. CONSTITUTION AND BYE-LAWS OF NGEL-NYAKI WOMEN GROUP

- 1.0 **NAME OF GROUP:** The Group hereby created shall be known as the Ngel-Nyaki **Women Group** and is established in Ngel-Nyaki as a self help community based organization (CBO) with the objective to ensure the development of Women and the conservation of the community biodiversity and the sustainable use of the renewable natural resources for the benefit of all the community members and women in particular.

- 2.0 **OBJECTIVES:**
 - 2.1 Maximize the contribution of renewable natural resources to livelihood of Group members.
 - 2.2 Work with wild resources, which are most important for poor and vulnerable people to ensure self reliance.
 - 2.3 Acquire the necessary skills to manage renewable natural resources
 - 2.4 Acquire methods of problem analysis that can be applied to day to day issues to improve the living standard of member of the group.
 - 2.5 Become strong, viable organization able to address problems which individuals cannot tackle alone.
 - 2.6 Becomes credible and able to attract financial and technical support from relevant development aid and Government agencies.
 - 2.7 Increase the capacity of the group to organize them and effectively control their resources.

- 3.0 **POWERS**
 - 3.1 In furtherance of the said objective the group may collaborate and/or affiliate with national and international organizations with similar objectives.
 - 3.2 Empowerment of members of self substance and self actualization.
 - 3.3 Carry out community/self help projects.
 - 3.4 Seek financial and technical support from donor and government agencies, both locally and internationally.
 - 3.5 Ensure that agriculture is restricted to farmland compartment
 - 3.6 Embark on income generating activities (IGA) that are environmentally sound.
 - 3.7 Ensure feedback of the association activities to the large Ngel-Nyaki Community.
 - 3.8 Collect funds, receive subscriptions, levies, royalties, fees, allowances and bequests and acquire income by selling products and other items.
 - 3.9 Engage in publicity in order to promote general awareness of its objectives activities.
 - 3.10 Organize training, lectures, conflicts resolutions, monitoring and evaluation objects and source financial assistance in this respect.
 - 3.11 Engage in sustainable management/sustainable utilization of renewable natural resources (RNR), using agreed RNR action plan.
 - 3.12 Negotiate and co-operate with Government and public bodies in the interest of conservation of natural resources.
 - 3.13 Lend, put out at interest, invest or reinvest any monies not immediately required on such conditions as may be considered necessary from time to time.
 - 3.14 Open and operate bank accounts.

- 3.15 Obtain or borrow money or guarantee payment of any monies not immediately required on such conditions as may deem suitable in promoting its objectives.
- 3.16 Enter into agreements and contracts;
- 3.17 Employ the money and property of the group in the promotion of its objectives.
- 3.18 Act in any other legitimate manner in order to realize its objectives.
- 3.19 Do all such other acts, deed and things as may be incidental or conducive to the objectives of the group.

4. **MEMBERSHIP**

- 4.1 Members are restricted to Ngel-Nyaki Women, who engage in NTFPs collections to generate income.

4.2 **MEETING ATTENDANCE**

- 4.2.1 Late coming to meeting will attract a fine of ₦50
- 4.2.2 Non attendance at meetings will attract a fine of one hundred naira and when a member absent himself or herself for 3 consecutive meeting without any cogent reason he or she will be given warning and if this persist the member will be expelled.
- 4.2.3 Stealing/or membership of secret cult(s) shall lead to instant expulsion without benefit of warning.
- 4.2.4 Every expelled member ceases to benefit from every rights or programs meant for the group.

5. **ELECTION PROCEDURE**

- 5.1 Officers shall be elected by a simple majority during a properly constituted general meeting of the group.

5.2 **TENURE OF OFFICERS**

- 5.2.1 Elected Officers shall act for a period of 3 years

5.3 **ELIGIBILITY**

Any member seeking any elective post in the Executive Committee must:

- 5.3.1 Be an active member of the committee
- 5.3.2 Have attended at least 75% of the meetings prior to the time of election.

6. **OFFICERS**

6.1 **Chairperson**

The Chairperson's responsibilities shall be:

- 6.6.1 To call, chair and conduct meetings
- 6.6.2 Be a signatory to the group's account
- 6.6.3 To represent the committee at external for a
- 6.6.4 To ensure proper feedback to and from the larger community, regarding the committee's activities.

6.2 **VICE-CHAIRPERSON**

The Vice-Chairperson shall conduct the duties of the Chairperson in the absence of the Chairperson.

6.3 **SECRETARY**

The Secretary shall perform the following functions:

6.3.1 Summon meetings as directed by Chairperson

6.3.2 Record meeting proceedings

6.3.3 Keeps all the Committee records

6.4 **ASSISTANT SECRETARY**

He/She deputizes for the secretary in the absence of the secretary

6.5 **P.R.O**

The P.R.O. shall perform the following functions:

6.5.1 Mobilize members for meetings and other activities

6.5.2 Ensure proper dissemination of information regarding the activities within and outside Akwazanto community.

6.6 **TREASURER**

The treasurer shall perform the following functions:

6.6.1 Collect, keep and disburse fund as directed by the executives

6.6.2 Keep the group passbooks/cheque books

6.6.3 Shall be signatory of group's account

6.7 **FINANCIAL SECRETARY:**

The Financial Secretary shall perform the following functions;

6.7.1 Keep records of all financial transactions and financial records of the group

6.7.2 Signatory to the association Account

6.8 **AUDITORS 1 & II**

Responsibility will include

6.8.1 Check the books of the financial secretary and treasurer as he or she deem fit

6.8.2 Give audit report to the house every quarter

7.0 **EX-OFFICIAL MEMBERS:**

These shall be representatives of donor, local government or state government. Their numbers shall not be more than 3 at any given time, their function shall be restricted to:

7.1 Facilitation of the association activities and programs

7.2 Advisory only

8.0 **MEETINGS**

8.1 **General Meetings:** Chairperson shall call general meetings at least once in a month

8.2 **Annual General Meeting:** The Chairperson shall call Annual General Meeting at least once in a year.

8.3 **Emergency Meeting:** The Chairperson shall summon an emergency meeting if requested by at least 1/3 of the executive members.

8.4 **Executive Committee Meetings:** The Chairperson shall summon an Executive Committee Meetings at least twice in a month before any General Meeting and the quorum for such a meeting shall be at least simple majority.

- 8.5 **Quorum at Meetings:** The quorum for all meetings except Executive Meetings shall be one third of members, with fractions rounded to the nearest whole number.
- 8.6 **Penalty for non-attendance at Executive Meetings:** Defaulter shall be made to pay a monetary fine of ₦100.
- 8.7 **Penalty for later coming to Executive Meeting:** Defaulter shall be made to pay a monetary fine of ₦ 50.

SUB-COMMITTEES

The group shall set up various sub-committee (Harvesting Committee or Sales committee) to ensure proper functioning of the committee/group as the need arises.

10. FEEDBACK

- 10.1 Activities of the committee group shall open:
- 10.2 The group shall regularly inform the elders and the community at large about the committee activities through meetings and discussions.

11. AUTHORIZED SIGNATURES

The Chairperson, the Treasurer and the Group Secretary shall be the authorized signatories to the group account. The Chairperson has to counter sign any cheque to make it valid.

12. DISSOLUTION OF THE GROUP

The Association may be dissolved if for any reason whatsoever it is no longer able to fulfill its objectives. Upon dissolution, the property and assets of the Association shall be transferred to Ngel- Nyaki Community.

NOTE

This constitution serves as a prototype for all other renewable natural resources management groups in Ngel -Nyaki community and they shall fashion their constitutions after this and abide by its provisions

Appendix XIIIa –Checklist of Plant Species in Ngel-Nyaki Forest Reserve.

Serial No	Name	Family	% Occurrence	
1	Piper capensis(white flower)	Piperaceae	30	1.94
2	Anthoноtha macropylas	Leguminosae	24.17	1.56
3	Landolphia owniensis	Apocynaceae	48.83	3.16
4	Dryopteris (fern)	Asplenniaceae	19.17	1.24
5	Voacanga bracteata	Apocynaceae	39.17	2.53
6	Clansena anisata	Rutaceae	25.83	1.67
7	Ficus spp (sadia-Fu)	Moraceae	32.5	2.10
8	Mala (kaka)		0.83	0.05
9	Rytignia umbellatum	Rubiaceae	0.83	0.05
10	Zanthoxylum zanthoxyloides	Rutaceae	24.17	1.56
11	Kom (Fu) used as walking stick		0.83	0.05
12	Deinbollia pinnata	Sapindaceae	66.67	4.31
13	Paulinia pinnata	Sapindaceae	6.67	0.43
14	Rothmania Hispida	Rubiaceae	33.33	2.15
15	Pleiocarpa pycnantha	Apocynaceae	43.33	2.80
16	Piper umbelatum	Piperaceae	25.83	1.67
17	Ficus spp. (Climber)	Moraceae	1.67	0.11
18	Macaranga barterii	Euphorbiaceae	10	0.65
19	Cyclosorus fern	Thelypteridaceae	19.17	1.24
20	Palisota hirsuta	Commeliniaceae	49.17	3.18
21	Chrysophyllum albedium	Sapotaceae	45.83	2.96
22	Aframomun oliverii	Zingiberaceae	8.33	0.54
23	Discoclaoxylum hexandrum	Euphorbiaceae	14.17	0.92
24	Lecaniodiscus cupanoides	Sapindaceae	0.83	0.05
25	Beilschimidia manii	Laueaceae	4.17	0.27
26	Garcinia manii	Cutiferae	70	4.52
27	Entandrophragma utile	Meliaceae	6.67	0.43
28	Entandrophragma angolense	Meliaceae	1.67	0.11
29	Kumbilainde (FU)		0.83	0.05
30	Lai (FU) (vine)		0.83	0.05
31	Acacia spp (vine)	Leguminosae	5.83	0.38
32	Psychotria spp	Rubiaceae	30	1.94
33	Memexylon spp	Melastomataceae	5.83	0.38
34	Ganderin (FU)		0.83	0.05
35	Strombosa postulata	Olacaceae	31.67	2.05
36	Isolona spp	Annonaceae	45.83	2.96
37	Newtonia spp	Leguminosae	30	1.94
38	Celtis zenkeni	Ulmaceae	6.67	0.43
39	Dracaenia syrculosa	Agavaceae	44.17	2.86
40	Carapa porcera	Meliaceae	49.17	3.18
41	Eeran (Yor)		5	0.32
42	Polyscias fulva	Araliaceae	10.83	0.70
43	Albizia ferruginea	Leguminosae	13.33	0.86
44	Ficus trilepsium	Moraceae	4.17	0.27
45	Glyphaeea brevis	Tiliaceae	0.83	0.05
46	Psorospermun corymbiferum	Gutiferae	15.83	1.02
47	Leea guineense	Leeaceae	49.17	3.18
48	Anchomanus dubois	Araceae	0.83	0.05
49	Anchomanus diformis	Araceae	3.33	0.22
50	Chassalia kolly	Rubiaceae	1.67	0.11

51	Balenyanyan (FU)		1.67	0.11
52	Ritchea spp	Capparridaceae	5.83	0.38
53	Aerva lanata	Amaranthaceae	40.83	2.64
54	Pterygota macrocarpa	Sterculiaceae	2.5	0.16
55	Vermonia conferta	Asteraceae	3.33	0.22
56	Brio (FU) draw soup even uncooked		0.83	0.05
57	Trichilia leudulotii	Meliaceae	16.67	1.08
58	Oxyanthus spp	Rubiaceae	33.33	2.15
59	Pavetta corymbosa	Rubiaceae	6.67	0.43
60	Diospyrous monbutensis	Ebenaceae	4.17	0.27
61	Commelina erecta	Commelinaceae	10.83	0.70
62	Trema orientalis	Ulmaceae	5.83	0.38
63	Ageratum conyzoides	Asteraceae	5.83	0.38
64	Ibbe (FU)		0.83	0.05
65	Taberamontana pachysiphon	Apocynaceae	13.33	0.86
66	Piper guineense	Piperaceae	0.83	0.05
67	Putoria spp	Rubiaceae	60.83	3.93
68	Polyanthes spp	Agavaceae	0.83	0.05
69	Diculepsis africanus	Oleaceae	11.67	0.75
70	Diospyrous mesipiliformis	Ebenaceae	4.17	0.27
71	Symponia simpiliformis	Cutiferae	12.5	0.81
72	Xylopia aethiopica	Annonaceae	9.17	0.59
73	Paulstamia johimbe		0.83	0.05
74	Musanga cercopoides	Cercopiaceae	2.5	0.16
75	Olax spp (Impilif - FU)	Olacaceae	4.17	0.27
76	Olax subscopoides	Olacaceae	0.83	0.05
77	Ancomia Klainiana (Santiria)	Burseraceae	24.17	1.56
78	Spe I of T3 (Hybiscus spp)	Malvaceae	0.83	0.05
79	Acanthus montanus	Acanthaceae	3.33	0.22
80	Alchornea laxiflora	Euphorbiaceae	1.67	0.11
81	Dalbergia welurinchii	Leguminosae	0.83	0.05
82	Ficus exasperata	Moraceae	1.67	0.11
83	Bridelia speciosa	Euphorbiaceae	4.17	0.27
84	Lapporta aestueris (fleuarya)	Urticaceae	1.67	0.11
85	Andropogon gayanus/firedrum	Graminae	0.83	0.05
86	Urena lobata	Malvaceae	1.67	0.11
87	Aspilia africana	Compositae	60.83	3.93
88	Combretum molle	Combretaceae	21.67	1.40
89	Sida acuta	Malvaceae	3.33	0.22
90	Dombeya spp	Sterculiaceae	3.33	0.22
91	Syzygium macrocarpa	Myrtaceae	6.67	0.43
92	Solenosterum morrostachys	Labiatae	1.67	0.11
93	Panicum maximum	Graminae	59.17	3.82
94	Q6 sp1	Asteraceae	0.83	0.05
95	Q6 sp2 (Pipers spp)	Piperaceae	0.83	0.05
96	Q5 sp3 (Rinorea dentata)		0.83	0.05
97	Entanda abysinica	Leguminosae	0.83	0.05
98	Protea cynacoides	Proteaceae	5.83	0.38
99	Lannea spp	Orchidaceae	6.67	0.43
100	Killari (FU) Leulap sp		19.17	1.24
101	Asystasia gigantea	Acanthaceae	1.67	0.11
102	Borreria octanoides	Rubiaceae	0.83	0.05
103	Terminalia avicenoides	Combretaceae	3.33	0.22

104	Kissenia abyssinica	Loasaceae	1.67	0.11
105	Emilia cocinea	Compositae	1.67	0.11
106	Hymenocardia acida	Hymenocardiaceae	0.83	0.05
107	Chita (FU)		0.83	0.05
108	Bahama grass-cynodon dastylon	Graminae	8.33	0.54
109	Lippia multiflora	Verbanaceae	0.83	0.05
110	Puereria lobata	Leguminosae	0.83	0.05
111	Bryophyllum pinnatum	Grassulaceae	0.83	0.05
112	Samaili (FU)		0.83	0.05
113	Machi (HA)		0.83	0.05
114	Karki (FU)		0.83	0.05
115	Daeryedus		0.83	0.05
116	Orungo (yor) Q7 sp2		1.67	0.11
117	(Lippia spp)	Labiatae	0.83	0.05
118	Q6 sp4 (Emo agbo-Yor)	Papilionoideae	0.83	0.05
119	Laggera alata		0.83	0.05
120	Fadosia spp	Rubiaceae	0.83	0.05
121	Psilanthus spp	Rubiaceae	0.83	0.05
122	Psychotria spp	Rubiaceae	0.83	0.05
123	Chlorophyllum spp	Liliaceae	0.83	0.05
124	Margaritamia discoidea		0.83	0.05
125	Erythrina/Butea spp		0.83	0.05
126	Hypoestis verticillatis		1.67	0.11
127	Brillantasia lamiun	Acanthaceae	3.33	0.22
128	Clerodendron spp		2.5	0.16
129	Nobellia spp	Nobeliaceae	1.67	0.11
	Total		1547.08	100.00

Appendix V - Checklist of NTFPs In Ngel-Nyaki

S.N.	Local Name	Scientific Name	Uses	Part used	Life Form
1.	Yaji	<i>Pipper umbelatum</i>	Spice, soup ingredient	Leaves, flowers	Herb
2		<i>Zanthoxylum zanthoxyloides</i>	Spice, medicine	Root stem back	Tree
3	mijingoro	<i>Garcina manii</i>	Mixer for drinks, chew stick	root	tree
4	mijingoro	<i>Garcina kola</i>	Stimulant/medicine	Seed/stembak/root	tree
5	Biro(Fu)		Draw soup	Leaves	shrub
6		<i>Entandrophragma angolense</i>	Medicine	Stem back	Tree
7		<i>Commelina erecta</i>	medicine	leaves	herb
8	kulahi	<i>Terminalia avicinoides</i>	Anti worm medicine, chew stick	Leaves , stem.back,root	Tree
9	Chita (Fu)		Headache/easy delivery	Leaves, stem back	Tree
10	Seldori	<i>Sida acuta</i>	Soup, weaving, medicine.	Leaves, stem back	Tree
11	Samaile(fu)		Rat poison	Stem back	tree
12	Karki(Fu)		perfume	Stem, root	tree
13	Kilare(Fu)	<i>Occimum sp</i>	medicine	leaves	shrub
14	Pelwahi(Fu)	<i>Entanda abyssinica</i>	Condiment/ blood enrichment	Fruit, stem back	Tree
15	Ebbe(Fu)	<i>Ficus spp.</i>	Edible fruit, mortar carving, cough	Fruit, stem, stem back	Tree
16	Sikakondo(Fu)	<i>Syzigium macrocarpa</i>	Edible fruit commercialized	fruit	tree
17		<i>Emilia cocinea</i>	Gonorhoea, ear ache	Stem , leves	herb
18	Dalamhi	<i>Dombeya sp</i>	Spear and bow, fencing ropes	Stem back	shrub
19		<i>Bryophyllum pinatum</i>	Cough, ear ache	leaves	herb
20	Burunburu	<i>Bridelia speciosa</i>	Tools handle	Stem	tree
21	Suaka	<i>Vernonia amygdalina</i>	Vegetable, medicine	leaves	shrub
22	Walasama		medicine	leaves	Tree
23	Biralahi	<i>Crotalaria sp</i>	Love portion	leaves	herb
24	Ngalbije	<i>Vitex doniana</i>	Leavy vegetable, edible fruits, wooden slate, medicine	Leaves, fruits, stem, stem back	Tree
25	Darle	<i>Phoenix reclinata</i>	Wine, mat weaving, edible fruit	Latex, stem, fruit	Tree
26	Tsomsom	<i>Syzigium guineensis</i>	Edible fruit	fruit	Tree
27	Bel bel	<i>Landolphia</i>	Edible fruit	fruit	vine
28	Sawaike	<i>Psorospermum sp.</i>	medicinal	Leaves, stem back	Tree
29	Zuma(Hausa)	<i>Appis spp.</i>	Food, medicine	Jelly	Insects
30	Gadelade(Fu)	?	Protein supplement	fruits	tree

Appendix VI: Satellite Map of Ngel- Yaki Forest Reserve

