



FOREST MANAGEMENT PLAN

FOR

**KATUGO MANAGEMENT PLAN AREA
(KATUGO AND KASAGALA CENTRAL FOREST
RESERVES)**

JULY 1, 2008 - JUNE 30, 2018



FOREWORD



Section 28 of the National Forestry and Tree Planting Act, 2003 provides that Central Forest Reserves must be managed in accordance with approved Forest Management Plans. The Plan takes into account international instruments and arrangements that have been coming out of the International Forestry Policy dialogue since the Rio Summit in 1992. It is also in line with the national macro-economic processes like the Poverty Eradication Plan, the Plan for Modernization of Agriculture, the Environment & Natural

Resources Sector Investment Plan, and the Uganda Vision 2035.

This Forest Management Plan has been prepared in consultation with stakeholders and especially the local communities. The objectives of, and activities in this Forest Management Plan will be implemented during the next 10 years, in line with the national development theme of *Growth, Employment and Prosperity for All*. Therefore, all stakeholders working within the Katugo Management Plan Area are obliged to align their activities with this Forest Management Plan.

Implementation of the activities in this Forest Management Plan will lead to increased forest health that will benefit local communities and all Ugandans in terms of livelihood improvement, revenue for Government and contribution towards environmental stability and the international society as a whole. The Plan will also provide opportunities for local communities, civil society organizations, the private sector and other investors to participate and benefit from management of Katugo and Kasagala Central Forest Reserves.

Therefore, in accordance with Section 28 of the National Forestry and Tree Planting Act, 2003, I approve this Forest Management Plan.

_____ Date

Hon. Maria Mutagamba

MINISTER OF WATER AND ENVIRONMENT

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Lastly, I thank Sector Manager of Katugo MPA, Dennis Oyiro, Joseph Sentongo, Plantation Manager and Josephine Birabwa NFA Head quarters, who typed this plan. Their tireless effort is appreciated.

GLOSSARY OF TERMS

Term	Meaning
1. Authority	The National Forestry Authority established by section 52 of the National Forestry and Tree Planting Act, 2003
2. Biological diversity	The variability among living organisms from all sources including, inter alia, terrestrial, marine, and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems. (Sophie Higman, et al 2002)
3. Block	A section of a Forest designated to represent a territorial division in a Forest Reserve
4. Buffer Zone	A zone within a protected area, protecting particularly sensitive areas such as strict nature reserves from undue human pressure that may exist outside the protected area, usually by allowing some limited and controlled human use within the buffer (Simon Grove, 1995)
5. Central Reserve	Forest An area declared to be a central forest reserve under section 6 of the National Forestry and Tree Planting Act, 2003
6. Collaborative Management	Forest A mutually beneficial arrangement in which a forest user group and a responsible body share roles, responsibilities and benefits in a forest reserve or part of it or an agreement signed under the Forest and Tree Planting Act for the purpose of defining a legally binding agreement between the lead agency and a partner for the utilization and management of a forest/forest resource.
7. Compartment	A permanent unit of management in CFR permanently marked on the ground and recorded on maps
8. Deforestation	Change of land cover with depletion of tree crown cover to less than 10% (European Forest Institute, 2002).
9. District Service	Forest Includes local governments, service providers and farmers with responsibility for mobilizing and co-ordinating forestry extension services in the districts, and developing forestry activities on farms, around forest reserves and in private and customary forests, through support services and incentives for sustainable forest management (NFP, 2002)
10. Ecosystem	A community of all plants and animals and their physical environment, functioning together as an interdependent unit. (Sophie Higman, et al 2002)
11. Endangered species	Any species which is in danger of extinction throughout all or a significant portion of its range (Sophie Higman, et al 2002)
12. Enrichment planting	The practice of planting trees within a natural forest to supplement natural regeneration (Sophie Higman, et al 2002)
13. Environmentally sensitive area	An area of land which is particularly susceptible to damage by forestry operations and where operations are prohibited or restricted: for example wetlands, watersheds, streamside buffer zones, conservation zones, recreation areas, areas near

	human settlements, sites of special ecological significance, habitats of rare or endangered species. (Sophie Higman, et al 2002)
14. Forest	<p>An area of at least one hectare of land with a minimum tree canopy cover of 30% and a minimum tree potential height of 5 meters (derived from UNFCCC, 2001). It includes all alpine, tropical high and medium altitude forests, woodlands, wetland and riparian forests, plantations and trees, whether on land held in trust by government (gazetted Forest Reserves, National Parks and Wildlife Reserves) or non-gazetted land - mailo, leasehold, freehold or customary lands (Forestry Policy, 2001).</p>
15. Forest degradation	The reduction of the capacity of a forest to provide goods and services. Capacity includes maintenance of ecosystem structure and functions (2nd Expert Meeting on Harmonizing Forest-Related Definitions Used by Various Stakeholders, 2002)
16. Forest ecosystem	Any natural or semi-natural formation of vegetation whose dominant element is trees, with closed or partially closed canopy, together with the biotic and abiotic environment (National forestry and Tree Planting Act, 2003)
17. Forest Encroachment	Activities that occupy a forest or part thereof without legal permission. It may include such activities as settlement, cultivation, grazing, etc.
18. Forest management	The practical application of scientific, economic, and social forestry principles to the administration of forests for specific forestry objectives (National Forestry and Tree Planting Act, 2003)
19. Forest Management Plan	A management plan for a forest prepared in accordance with section 28 of the Forestry Act
20. Forest management unit (FMU)	An area of forest under a single or common system of forest management (Sophie Higman, et al 2002)
21. Forest Reserve (FR)	An area declared by law to be a central or local forest reserve (National Forestry and Tree Planting Act, 2003). For purposes of natural forests, forest reserves are placed in Category VI (Managed Resource Protected Area) of IUCN Categories for Nature Protection. This Category of protected area is managed mainly for the sustainable use of natural ecosystems.
22. Forest User Group	A group comprising members of a local community registered in accordance with CFM regulations
23. Forestry	The management and conservation of forests and trees, and includes the management of land that does not have trees growing on it, but which forms part of an area reserved for or dedicated to forestry (National Forestry and Tree Planting Act, 2003). It includes all activities related to forests, tree growing, forest produce, forest conservation, forest management and forest utilization (Forestry Policy, 2001)

24. Inventory	A survey carried out to determine, in a given area, the constitution, extent and condition of a forest or areas reserved for forestry
25. Local Community	Defined as “persons and households living in close proximity to a forest and identified by common history, common culture, or common residence and may, from time to time, include all the residents of a village which share a boundary with a forest
26. Local Government Or Local Councils	Means local government councils and administrative unit councils established under section 42 of Act No. 1(5) of the Local Government Act 1997
27. Management Plan Area	An area covered by FMP. It may be one forest reserve or a collection of reserves
28. Natural forest	Forest areas where most of the principle characteristics and key elements of native ecosystems such as complexity, structure and diversity are present (Sophie Higman, et al 2002)
29. No-timber forest product (NTFP)	All forest products except timber, including other materials obtained from trees such as resins and leaves, as well as any other plant and animal products (Sophie Higman, et al 2002)
30. Permanent Forest Estate (PFE)	Land that is set aside for forestry activities in perpetuity (Uganda Forestry Policy, 2001)
31. Production Forest	Forested areas, which are treated by using specific silvicultural practices. The stands are treated repeatedly and sometimes in order to achieve multi-purpose goals (European Forest Institute, 2002).
32. Production Zone	As for “production forest” but the area is part of the overall forest nature conservation Programme.
33. Protected Area	All land gazetted and held in trust by government, such as Forest Reserves, National Parks and Wildlife Reserves (Uganda Forestry Policy, 2001)
34. Savannah	Grassland dotted with trees. Grasses form the predominant vegetation type, usually mixed with herbs and shrubs, with trees scattered individually or in small clumps (TheFreeDisctionary.com Encyclopedia)
35. Strict Nature Reserve	An area within a forest reserve set aside for species and habitat protection and in which only research, education and monitoring are permitted. (National forestry and Tree Planting Act, 2003).
36. Sustainable forest management (SFM)	The management of forest resources so as to supply goods and services to satisfy the needs of present and future generations in perpetuity (Uganda Forestry Policy, 2001)
37. Sustained yield	Production of forest products on a perpetual basis, ensuring that the rate of removal of forest products does not exceed the rate of replacement over the long term. (Sophie Higman, et al 2002)
38. Threatened species	Any species which is likely to become endangered within the foreseeable future throughout all or a significant portion of its range (Sophie Higman, et al 2002)

39. Tropical Forests (TMF) - also known as tropical rain forests	Moist	Broadleaf forests found in a belt around the equator and are characterized by warm humid climates with high year-round rainfall. Uganda's TMFs belong to the Afrotropic Ecozone with the flagship Albertine Rift forests that extend to Congo (DRC), Burundi, Rwanda, and Tanzania (TheFreeDisctionary.com Encyclopedia). Normally forests are evergreen although some species may shed their leaves periodically.
40. Woodland		Land that has a crown cover (or equivalent stocking level) of more than 30% of trees not able to reach a height of 5metres at maturity (FAO 2000a (FRA 2000 Main Report) but modified to read canopy cover of 30% instead of 10%)

ACRONYMS

Asl	Above Sea level
AAC	Annual Allowable Cut
AWP	Annual Work Plan
BZ	Buffer Zone
CBO	Community Based Organisation
CFM	Collaborative Forestry Management
Cm	Centimetres
CPT	Compartment
DFDP	District Forestry Development Plan
DFO	District Forest Office
DFS	District Forest Services
EC	European Commission
EIA	Environmental Impact Assessment
EU	European Union
FD	Forestry Department
FMP	Forest Management Plan
FNCMP	Forest nature Conservation master Plan
FORRI	Forest Research Institute
FR	Forest Reserve
FRMCP	Forest Resource Management and Conservation Programme
Ha	Hectares
ITCZ	Inter Tropical Convergent Zone
L.C	Local Council
LFR	Local Forest Reserve
LN	Legal Notice
M & E	Monitoring and Evaluation
M ³	Cubic Metre
MPA	Management Plan Area
NARO	National Agricultural Research Organisation
NBS	National Biomass Study
NEMA	National Environment Management Authority
NFA	National Forest Authority
NGO	Non Governmental organisation
NRA	National Resistance Council
°C	Degree Centigrade
SI	Statutory Instrument
SNR	Strict Nature Reserve
SPGS	Saw Log Production Grant Scheme
Spp.	Species
UWA	Uganda Wildlife Authority
UEB	Uganda Electricity Board
FSC	Forestry Stewardship Council

TABLE OF CONTENTS

GLOSSARY OF TERMS	4
EXECUTIVE SUMMARY	12
CHAPTER 1: PHYSICAL DESCRIPTION	15
1.1. NAME, LOCATION, BOUNDARIES AND AREA	15
LOCATION	15
1.2. LEGAL STATUS (OWNERSHIP, RIGHTS AND PRIVILEGES)	15
TABLE2.BOUNDARY LENGTH OF THE RESERVES	16
REMARKS.....	16
1.3. TOPOGRAPHY AND ALTITUDE	16
1.4. SOILS, GEOLOGY AND DRAINAGE	16
1.5. CLIMATIC CONDITIONS (TEMPERATURE, RAINFALL, HUMIDITY).....	17
TABLE 5: VEGETATION DISTRIBUTION AND TYPES IN KATUGO CFR.....	18
SUB-COUNTY	21
FOREST RESERVE	21
SUB- COUNTY ADJACENT	21
NO. OF CATTLE	21
TABLE 10: NON-TIMBER RESOURCES	22
2.6.1 INFRASTRUCTURE	27
TABLE 15: EXISTING BUILDINGS AT KATUGO FOREST STATION	28
2.6.5 LABOUR	29
2.7.1 REVENUE	29
2.7.2 EXPENDITURE	29
3.1.0 ENVIRONMENTAL PROFILES	21
3.1.1 BIODIVERSITY STATUS AND FUNCTION.....	21
BIRDS	22
MAMMALS	22
BUTTERFLIES	22
OVERALL	22
THE RESERVE WAS RESERVE IN 1963 AND THE ORIGINAL PLAN WAS TO PLANT 400- 600 HA OF PINE PER YEAR IN KATUGO AND THE NEIGHBOURING KASAGALA FOREST RESERVES (10,298 HA) IN ORDER TO ACHIEVE ADEQUATE SUPPLY OF RAW MATERIALS FOR PULP WOOD PLANT THAT WAS TO BE ESTABLISHED IN JINJA	23
TABLE 20: IMMATURE CROP AREA STATEMENTS FOR KATUGO PLANTATION (REPLANTED):.....	25
5.2 MANAGEMENT CIRCLES	27
5.3 OBJECTIVES OF MANAGEMENT	27
STANDING VOLUME	31
TABLE 24: DETAILED HARVESTING PLAN INDICATING ANNUAL REMOVALS	32
6.4.4FOREST RESERVE BOUNDARIES.....	38

TABLE 28: SUMMARY OF CALCULATED REVENUE/ VALUE OF STANDING VOLUME AT KATUGO	48
TABLE 29: SUMMARY OF CALCULATED REVENUE/ VALUE OF STANDING VOLUME AT KASAGALA.....	50
<i>Forest level</i>	54
<i>Monitoring Team</i>	54
<i>NFA Board of Directors</i>	54
<i>One of the roles of the Board is to monitor performance of the NFA. Once a year, the Board will formally assess performance based on the monitoring plan</i>	54
<i>Performance Agreement Monitoring Committee</i>	54
TABLE 35: MONITORING FRAMEWORK FOR THE MANAGEMENT PLAN	55
PROCESS INITIATION AND PROGRAMME.....	63
DESCRIPTION.....	64
DATE	65
EVENT	65
SIGNIFICANCE TO FOREST MANAGEMENT	65
1963	65
GAZZETEMENT OF 2,546 HA.....	65
DEMARCATING FOR SPECIFIC FORESTRY OBJECTIVES.....	65
1964	65
FIRST TRIAL PLANTING OF CONFERS <i>MAESOPSIS EMINII</i> AND <i>TERMINALIA IVORENSIS</i>	65
INCREASE WOOD SUPPLY THROUGH RESEARCH OF INDIGENOUS AND EXOTIC SPP. .	65
1966- 1976	65
EXTENSIVE PLANTING OF PINUS <i>CARRIBAEA</i>, <i>P. OOCARPA</i>, <i>P. KESIYA</i>, <i>P. INSULARIS</i> AND <i>P.MARKUSSII</i>	65
ESTABLISHMENT OF IMPORTANT AREA OF COMMERCIAL SCALE PLANTATIONS.	65
EARLY 1970'S.....	65
SWAMPS ARE ADDED TO EXISTING RESERVES AREA TO PROVIDE WATER FOR PLANTATIONS	65
ENHANCING PLANTATIONS MANAGEMENT WITH ADEQUATE SUPPLY.....	65
1989	65
FD CARRIED OUT INVENTORY OF KATUGO PLANTATIONS PLANTED:	65
DETERMINING THE AVAILABLE RESOURCES FOR PROPER PLANNING AND MANAGEMENT PURPOSES.....	65
1992	65
LOGGING OPERATION STARTED IN MATURE STANDS.	65
INDUSTRIAL USE OF MATURE CROP.	65
2000	65
PREPARATION OF MANAGEMENT PLAN FOR KATUGO FOREST RESERVE BY FD STAFF	65
IMPROVING MANAGEMENT AND RESOURCE USE CONTROL.....	65

2004	65
NFA TOOK OVER THE CONTROL OF KATUGO CENTRAL FOREST RESERVE FOR FORMER FD.....	65
IMPROVING EFFECTIVE MANAGEMENT OF THE CFRS.....	65
2004	65
MASSIVE REPLANTING BY NFA.....	65
MOST OF THE CLEAR FELLED AREAS WERE PLANTED.....	65
APPENDIX 14: ANNUAL SCHEDULE OF ACTIVITY 2008/9	75
APPENDIX 15: EXPENDITURE FOR YEAR 2004-2005.....	76
Q4.....	76
APPENDIX 16: SUMMARY OF VIEWS/OPINIONS FROM COMMUNITY CONSULTATIONS.....	78

EXECUTIVE SUMMARY

Katugo Management Plan area is composed of Katugo and Kasagala Central Forest Reserves. Katugo CFR covers 3,318 ha. About half of this reserve is under Pine plantations, which consist of *Pinus caribaea* and *P. oocarpa* grown for the production of timber. Kasagala Forest covers an area of 10,298 ha. Kasagala Forest Reserve is predominantly Savannah woodland classified as *Combretum- Terminalia* dominated woodland.

Part 1: Covers the general description relating to the Forest Reserves. The general description is contained in Chapter 1.

Chapter 1: deals with the Physical description of the Reserves. This includes the names, size, boundaries and location of the reserves. It also covers Legal status of the reserve, topography and altitude of the MPA, Soil, geology and drainage, climatic conditions (temperature, rainfall and relative humidity). The existing vegetation and crop types and distribution are also outlined in this chapter.

Chapter 2: Outlines Socio-economic Environment of the Forest Reserves in terms of economic values of the Forest; and potential timber non-wood supplies. The chapter also covers markets, growth statistics and yield of the plantation. Stakeholders' involvement and partnership arrangement, including threats and conflict; as well as community use of forest products are also considered in this chapter. Other issues considered under this included existing infrastructure, staff and labour relation; and Revenue and expenditure.

Chapter 3: Deals with Environmental Consideration. This covers Biodiversity status, Ecological functions of the forest reserves wetlands and other ecological fragile areas such as river/ stream banks and lakeshores. Social –cultural sites and problems and issues are also considered.

Chapter 4: Presents the history of management. Past management Plans and original objectives of management is considered. History of use of the resources and past silvicultural practices is also dealt with here. Existing infrastructure is considered in this chapter.

Part 2: Covers planned management activities over a planned period of time for MPA.

Chapter 5: covers the basis of the Objective of the Management Plans. Issues considered in this Chapter include economic, social, ecological and environmental reasons why forest is managed. It also mentions management circles in which the area is to be divided.

Chapter 6: Themes considered under this sections included prescription of each working circles, where issues like production, silviculture, protection,

conservation, recreation, CFM, research and partnerships are considered. Other issues considered included the existing infrastructures, staff needs and the financial forecast of the MPA.

Chapter 7: States action to be undertaken to enhance positive impacts and mitigation of negative environmental impacts, taking into consideration the ecological, socio-economic and technical aspects of the environment. Strategies for fragile ecological ecosystems such as wetlands, biodiversity etc are also considered in this chapter.

Chapter 8: Deals with organisational arrangement of the MPA. Issues of staff and labour, equipments and tools needed, health and safety provisions, and records keepings are some of the requirements considered for the effective implementation of this Management Plan.

Chapter 9: covers projected revenue and expenditure over the plan period and statement of cost, benefits and profitability.

Chapter 10: Considers M & E with respective indicators for all objectives. Responsibilities for monitoring different aspects of indicators, a timetable for monitoring, budget and reporting procedures.

PART 1: GENERAL DESCRIPTION OF MPA

CHAPTER 1: PHYSICAL DESCRIPTION

1.1. Name, Location, Boundaries and Area

The Forest management Plan covers Katugo and Kasagala Central forest reserves, which constitute a management plan area under Katugo Plantations in Nakasongola District.

These Forest Reserves are in Kakooge and Wabinyonyi Sub-counties of Nakasongola District.

KASAGALA CFR- lies between 0° 55 and 1° 33' N and 32° 00 and 32° 35 E. this reserve is located in Kakooge and Wabinyonyi Sub-counties about 100 km from Kampala on Kampala- Gulu highway. On the west, it borders with the Kampala-Gulu trunk road, with a small interruption of Katugo Pine plantation.

KATUGO CFR- lies between 1° 09 and 1° 12" North latitude and from and 32° 20 to 32° 27 E longitude. It is about 100 km from Kampala (opposite Kasagala CFR) along Kampala - Gulu highway in Kakooge. About half of the reserve is under pine plantation. The remaining area was never planted or is clear felled.

Table 1: Area of Forest Reserves and their Distribution by Sub County

Name of FR	Area	Location	Description
Kasagala	10,298	Kakooge and Wabinyonyi sub-counties, partly along Kampala- Gulu highway- bordering with Katugo CFR	Savannah wood/ grassland, classified as <i>Combretum- Terminalia. Loudetia</i> woodland (N ₁), with <i>Sorghastrum rigidifolium</i> grassland (W ₂).
Katugo	3,318	Kakooge Sub-county	Large plantation (approx 1,600 ha) of pines (<i>P. caribaea</i> , <i>P. oocarpa</i>), established since the 1960s. Many areas are now mature and are being harvested. Few areas have been replanted 1200 ha is woodland savannah with tree species like <i>Terminalia</i> , <i>Combretum</i> , <i>Albizzia</i> , <i>Teclea nobilis</i> and an approximately 100 of swamps

1.2. Legal Status (Ownership, rights and privileges)

Central forest Reserves (CFR) are held and protected in trust for the people of Uganda as stipulated in article 237 (2) b of the Constitution of the Republic of Uganda, 1995. The two CFRs are managed as Central Forest Reserves, under the Forest Reserve Declaration Order, statutory Instrument (SI) No. 63 of 1968. Management and control are vested in the national Forestry and Tree Planting

Act, 2003. Table 1 and 2 give full details of the respective areas, legal status, a brief description of each forest reserve and other related matters.

Table 2. Boundary length of the reserves

Forest Reserve	Cutline (m)	Natural & other (m)	Total (m)
Katugo	37000	5700	42700
Kasagala	56200	11000	67200
Total	93200	16700	109900

Table 3: Legal Ownership and legal Constraints/ Claims

Name of Reserve	Area (Ha)	Year of 1 st Gazettment	Subsequent gazettment	Map sheet Ref.	FD Boundary plan No.	Remarks
Kasagala	10,298	LN No. 167 of 1963 as LFR	SI 67 of 1968 SI 167 of 1968 SI 63 of 1968	50/4, 51/3	P.L. 1668 pt, 1673pt, 1674, 1679pt, 168pt, 1792, S.E.2209, 2210, 2215	Some settlement in the area zoned as Strict nature reserve
Katugo	3,318	1963	SI 176 of 1968 SI 63 of 1968	50/4	BP 1634, P.L 1669 PT, 167 PT, 1802PT, S.E 2214	Because of the large population of landless cattle keepers around the reserve, many illegally graze their animals in the reserve. The presence of cattle keepers also presents threats of forest fires during the dry season.

1.3. Topography and Altitude

The general topography of most parts is undulating plain between 1,036- 1,160 m above sea level. Generally, the topography is flat with few outcrops (inselsbergs) such as Kasagala hill reaching 1,160 m a.s.l.

1.4. Soils, Geology and drainage

In both Kasagala and Katugo CFRs, red Buruli catena and Lwampanga soils are found on hillsides and slopes and broad plains/ valleys or swamps respectively. The red Buruli soils developed from laterized gneiss and granite rich basement rock complex. The Lwampanga soils developed from old alluvial material, with low organic matter content, deep and strongly acidic sandy to loam soils are common.

The area is generally flat and is characterised by broad seasonal streams along swamps. The water along the streams flows very slowly or stagnates and eventually evaporates or percolates into the soil below.

1.5. Climatic conditions (temperature, rainfall, humidity)

The climatic conditions of Kakooge are quite hot experiencing high temperatures throughout the year with mean annual maximum readings of 33 degrees centigrade and the mean annual minimum temperature of 21.5 degrees centigrade at times. The area receives rainfall twice a year, ranging from 500mm to 1000mm per annum, with the first rainy season from the months of March through May, and the second rainy season from August to November. But at times there are delays in between whereby the first rains have been taken as best for subsistence planting. Rainfall is mainly convectional characterized by afternoon and evening occurrences. See daily Rainfall records in Annex 5.

Table 4: Monthly Rainfall Records for Katugo Forest Station; from Jan 2003- Apr 2006

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
2003	N/A	N/A	N/A	N/A	N/A	56.5	N/A	91.0	104.9	163.6	166.5	87.0	669.5
2004	121.0	32.0	90.0		16.0	19.0	4.5	104.0	181.0	219.0	137.7	7.1	931.3
2005	30.0	0.0	202.0	111.5	144.0	62.5	17.5	154.0	157.5	56.0	31.0	0.0	966.0
2006	10.0	64.0	98.0	239.0									411.0

Source: FD/ NFA Katugo Office Records

CHAPTER 2: VEGETATION AND EXISTING CROPS

Table 5: Vegetation distribution and Types in Katugo CFR

Vegetation Type	Brief description of vegetation type	Area (ha) or % of FR	Estimated canopy cover
Plantation type	Pine spp	1,600	48%
Woodland savannah	<i>Acacia, Combretum, Albizzia, Terminalia, Teclea nobilis, Tamarindus etc.</i>	1,200	36%
Swamps	Marshy swamps with tough grasses	100	3%
Clear-felled	Area harvested not replanted (bush)	418	13%
		3,318	100

Table 6: Vegetation distribution and Types in Kasagala CFR

Vegetation Type	Brief description of vegetation type	Area (ha) or % of FR	Estimated canopy cover
Plantation type	Pine spp	558	5.4%
Woodland savannah	<i>Combretum-Terminalia-Loudetia Savannah</i>	9326	90.6%
Grassland	Sorghastrum grassland	414	4%
		10298	100

The vegetation of the CFRs can be classified into three (3) vegetation types, as indicated in the tables above. The vegetation cover in Kasagala is, however, changing rapidly due to constant annual fires, overgrazing, uncontrolled charcoal burning, and opening of land for agriculture. Mature trees are becoming scarce, but shrubs and bushes are on the increase. *Combretum* and *Terminalia* species are generally giving way to *Acacia*, as the latter is proving to be more fire resistant and dominant. It replaces the former species wherever they are destroyed by elephants as in Murchison falls park or by charcoal burning as is currently happening in these reserves.

According to the land use/cover studies in CFR's of 1990 and 2005, the land cover in the two reserves stood as below

Table 7: Land use/cover trends in Katugo and Kasagala reserves.

Land cover	Kasagala (ha)		Katugo (ha)	
	1990	2005	1990	2005
Conifers	0	248	1650	1789
Woodland	7711.03	2023	1054.4	496
Bush	0	3177	23	924
Grassland	2189	1657	467	0

Wetland	0	0	82	55
Encroachment	397	3192	38	50
Built up	0	1	3	3
Water	0.97	0	0.6	1
Total	10298	10298	3318	3318

Source: NFA records.

i) Pine Plantation; The 1965 Pine species trials were planted at Katugo in 1965. Total planted area up to 1976 was 2955 ha out of 3318 ha in Katugo CFR. Successful species planted in Katugo are *Pinus caribaea*, *Hondurensis* and *P. oocarpa* with small areas of *P. kesiya*. In Kasagala, *P. caribaea* and *P. oocarpa* were planted.

Pine plantation has transformed the natural vegetation, suppressing shrubs and grass in areas where tree survival is good. Pine needles cover the floor and as no thinning was done, tree branches form thick canopy.

Apart from fires, large areas were clear felled but minimally replanted which resulted into shrubs/grasses re appearing. However, with the intervention of NFA, massive replanting is taking place in Katugo CFR.

On the other hand, plantation establishment in Kasagala CFR is still at the initial stage. The NFA planted area (86 ha) since November 2002 was part of a **Demonstration Plantation** planted by Forest Resources Management and Conservation Programme (FRMCP) in collaboration with the then Forestry Department. This area is a mainly young pine tree, along Kampala-Gulu highway (opposite Katugo Plantation).

(ii) Savannah Grass/Woodland

The vegetation types covers the unplanted areas of Katugo and Kasagala CFRs. Common savannah grass/woodland vegetation in Nakasongola Sector according to Langdale Brown, *et.al* (1964), is given below in relation to the location of the forest reserves.

- (a) *Combretum* Savannah-Moist *Combretum* savannah is common in Kasagala and Katugo CFRs. Where deciduous broad-leaved trees of *Combretuacea* family constitute the bulk of the wood cover, the dominant grass is *Hyperrhenia rufa*. Tree species include *Combretum molle*, *Terminalia glaucescens* and *Albizia Zygia*. Post-cultivation succession is dominated by *Imperata cylindrica var africa* (Lusenke).
- (b) **Dry Combretum Savannah-** Dry *Combretum* savannah is the most dominant in Katugo, and Kasagala CFRs, Kakooge Sub-county. Two communities of this vegetation are common: - *Combretum-Terminalia* –*Loudetia* and *Combretum-Hyparrhenia*. Both communities are either fire climax or

influenced by fire, with significant broad leaved deciduous species. *Acacia* spp or others associated with drier conditions are absent.

Combretum-Terminalia-Loudetia savannah is a fire climax savannah, composed of broad leaved deciduous *Combretum molle* and *Terminalia glaucescens* and perennial grasses. *Loudetia arundinacea* grass and its tussock habit determine the structure of the grass layers. Annual fires affect the grasses and possibly the scarcity of shrubs.

Combretum-Hyparrhenia savannah is also a fire climax savannah, dominant species being *Combretum collinum*, *C. molle* with *Albizia Zygia* as co-dominant. The grass layer is mainly *Hyparrhenia filipendula* where *Andropogon dummeri* is also abundant.

(iii) Undifferentiated Deciduous Thickets-This is the most dominant type of dry thicket spread in Nakasongola District as a whole. *Acacia brevispica*, *A. senegal*, *Allophylus africanus*, *Euphorbia candelabrum* and *Grevia mollis* are usually abundant.

CHAPTER 3: SOCIO- ECONOMIC ENVIRONMENT

2.1 Total economic value (Forest Use/Economic values)

The population of Nakasongola District, particularly in sub-countries surrounding the two CFR's of Katugo and Kasagala has steadily been increasing; which has both direct impacts on the forest resources. Table 8 shows the population trend of these sub-counties.

Table 8: Population Growth and Distribution in Sub-counties.

Sub-county	Land Area (km ²)	No. of people (1991)	No. Of people (2002)	Population Density persons/km ²
Kakooge	554.99	17,475	20,615	37
Wabinyonyi	437.73	16,977	13,621	31
Total				

Source: Nakasongola Local Government 2002 (Population census)

The two (2) CFRs are major grazing areas for cattle. Although this is illegal, cattle owners overlook legal implications. It should be noted that Kasagala, has no grazing land vegetation limitation compared to Katugo Plantation (the planted area of Kasagala is still quite small). Table 9 indicates the cattle stocking in sub-countries.

Table 9: Cattle stocking in sub-countries Adjacent to CFRs.

Forest Reserve	Sub- county Adjacent	No. Of cattle
Katugo	Kakooge	19,342
Kasagala	Kakooge, Wabinyonyi	25,522
Total		

Source: Nakasongola Local Government 2001 (cattle census)

Charcoal production is widespread as an income generating activity. According to Nakasongola DFDP 2003-2014, charcoal production engages about 70 percent of all households in the district. The impact on the forest resources is immense, when Forestry Department estimated the conversion of round wood to charcoal as six to one (6:1 or 16 percent).

Sawn timber from Katugo Plantation is a product of local and national interest/value. Its processing offers employment opportunities to people within and from outside the District, while the timber itself contributes to the building/construction industry development and furniture making. Other economic values, which cannot be qualified nor expressed in monetary terms but very useful in human life, include firewood for domestic use, herbal medicines, poles/grasses etc. The contribution of trees and forests in climate mitigation cannot be underestimated.

2.2 Potential timber non-wood supplies

The population of Katugo Forest Management Plan Area heavily depend on the reserves for grass (pastures) for their animals, medicinal herbs, bush meat and bee keeping. Those products are normally used free of charge.

Table 10: Non-Timber Resources

Species	Uses	Users- who?	Estimated Abundance	Annual allowable off take (if known)
Various tree species- <i>Terminalia, Combretum, Acacia etc.</i>	Charcoal, poles, firewood	Local community, charcoal burners & Traders	Common	Not quantified
Grasses	Pastures for grazing animals and thatching	Cattle grazers and local community	Plenty	Not quantified
Medicinal plants	Herbal medicine	Local community	Common	Not quantified
Bush meat	Food and Income	Local community	Not Common	Not quantified
Honey	Food and Income	Local community	Not Common	No information
Fruits	Food and Income	Local community	Common	No information
Building materials- <i>poles, post etc.</i>	Building	Local community	Common	No information
Firewood	Fuel wood & Sale	Local community	Common	No information

Markets, growth statistics, and yield

Market and Demands

Sawn timber has a ready market and high demand as the building/construction industry is fast developing. Wood demand is far above supply under sustained yield management. This is because of increased utilisation capacity sawmills that buy standing volume of round logs in large quantity.

Table 11: Quantity of Round wood and Resins Harvested during 2000/01-2005/Apr 06 in cubic metres (m3) for Round wood and Kg for Resins.

Product	2000/01	2001/02	2002/03	2003/04	2004/05	2005-March 06	Total
Round wood	1073.05	1,441.28	4,644.08	15,637.07	1,551.78	6,226.20	30,573.50
Resins	-	3,000.00	3,670.00	-	-	-	6,670.00

Source: FD/ NFA Katugo Office Records

2.3 Felling Coupes

To ensure that the felling doesn't exceed the sustained yield management, NFA adopted a system of demarcating the area for harvesting into felling coupes, where coupes are demarcated into areas of 5 ha, where the targeted volume is recommended at 2,000 m³ based on an average stocking of 400 m³ has proved to be good practise. Table 12 below shows the felling Coupes for Katugo Plantation for the year 2005/ 2006, which has been demarcated into 18 coupes.

Table 12: Felling Coupes for Katugo Plantation

Coupe No.	Compartment Number	Species	Coupe Area	Volume per Hectare (m ³)	Coupe Volume (m ³)
1	9	<i>P. caribaea</i>	5.0	345	1,725
2	9	<i>P. caribaea</i>	5.0	305	1,525
3	9	<i>P. caribaea</i>	5.0	345	1,725
4	9	<i>P. caribaea</i>	5.0	345	1,725
5	9	<i>P. caribaea</i>	5.0	250	1,250
6	9	<i>P. caribaea</i>	5.0	250	1,250
7	9	<i>P. caribaea</i>	5.0	305	1,525
8	9	<i>P. caribaea</i>	5.0	305	1,525
9	9	<i>P. caribaea</i>	5.0	305	1,525
10	9	<i>P. caribaea</i>	5.0	390	1,950
11	9	<i>P. caribaea</i>	5.0	370	1,850
12	9	<i>P. caribaea</i>	5.0	370	1,850
13	9	<i>P. caribaea</i>	5.0	305	1,525
14	9	<i>P. caribaea</i>	5.0	305	1,525
15	9	<i>P. caribaea</i>	5.0	305	855
16	9	<i>P. caribaea</i>	1.7	200	340
17	9	<i>P. caribaea</i>	3.5	370	1,295
18	9	<i>P. caribaea</i>	0.9	344	310
Total			79		25,275

Source: NFA Inventory Report conducted in November 2005

2.4 Stakeholders and partnerships

2.4.1 Stakeholders Analysis (Analysis of problems and issues)

A stakeholder is a person or group of persons with direct or indirect interest in something (e.g. forest resources), whose activities can impact on that resource or is being impacted on by the resource. A stakeholder may have or have no influence but has a role to play.

During consultations with communities adjacent to FRs, as immediate stakeholders (Annex 2), they responded to problems/issues/concerns raised by the planning team, namely:

- Products/benefits/advantages from forests

- How forest resources are used
- Threats from and to forests
- Problems experienced by communities
- Proposals for the plan

It was obvious that these stakeholders included: -

- Charcoal burners
- Cultivators in FRs from outside (encroachers_
- People living within FRs (settlers)
- Cattle grazers
- Hunters
- Herbal medicine collections
- Firewood collectors
- LC officials (Administrations)
- Workers of NFA or Saw millers (before the latter stopped).

Their views/opinions are indicated in Annex 3. Major problem/issues/concerns are summarised below:

- People evicted abandon gardens and lose properties
- Workers of FD/NFA are not paid wages
- Some of those evicted have no means to go elsewhere (poor people).
- Bad working relationship between FD and communities.
- Poor management of Katugo plantation by FD.
- People settled by Government agency (ministry of Rehabilitation) in FRs since 1979 becoming homeless when evicted.
- Local people not given jobs but labour imported.
- Grazing (illegal) a major activity, owners landless.
- Community proposals for the plan are included under specific programmes, for improving management of CFRs.

A more detailed stakeholder's analysis reference is shown in Forest Reserve Profiles of Nakasongola DFDP, 2003-2014.

A cross-section of stakeholders held a one-day workshop and examined views/opinions collected during community consultations. Proposed vision and management strategies/actions for the plan are given in the *Planning Matrix*, for plantation development and savannah woodland management. Participants list is shown in annex 4

2.4.2 Institutional Partners in Management

There was no formal or documented institutional partnership between Forestry Department and Local council (LCs) and probably there will be none between these LCs and the National Forestry Authority (NFA). However, the decentralisation system made it mandatory for these two institutions to cooperate in forest management. This was particularly important to control and curb illegal activities both inside and outside forest reserves.

The National Forestry and tree planting Act, 2003 defines and separates roles and responsibilities of NFA and District Forestry Service (Ref. Sect.48 (3) and Sect.54. The Act is explicitly clear on the expected linkage/consultation or working relationship between NFA and DFS [Ref. Sect. 48(3) (b) and Sect. 54 (2) (a)].

The same Act has a provision for NFA to liaise with the National Environment Management Authority (NEMA) by virtue of NFA being a lead agency in forestry matters, Sect. 54(2) (g). Some NFA officers were appointed environment inspectors.

Security agents are important in handling illegal activities and NFA will frequently seek their assistance.

2.4.3 Non- Institutional Partners

Communities adjacent to forest reserves have been instrumental in forest management, especially in plantation activities. Apart from the socio-economic employment aspect, these people have been very useful in fire fighting in Katugo plantation, which has suffered from almost annual fires, either from outside or absolute arson

The National Forestry and Tree Planting Act 2003, strengthens the role of communities in forest management partnership regarding FMP consultations (Sect. 28 (1)).

There are investors who have started establishing private plantations in Kasagala CFR either under the Saw log Production Grand Scheme (SPGS) or on their own finances. Those hoping to benefit from the SPGS have to establish and manage at least 25ha in compliance with SPGS conditions. However, utilising own funds are not restricted to any minimum area but are expected to carry out proper plantation management practices. Table 13 gives detail of the investors allocated land in Kasagala CFR.

Table 13: Prospective Investors in Kasagala CFR.

No.	Name of investors	Allocated area (ha)	Area planted to date	Remarks
1	Mr. E. Mupada	100	100	All the allocated area planted
2	Mr. R. Nabanyumya	100	100	All the allocated area planted
3	Ms Tropical Tree Planting Agency	100	12	Only beating-up being done this season Apr/ May 06
4	Mr. W. Bamwerinde	50	15	
5	Mr. E. Serunga	25	12	
6	Damian Akankwasa	To renew 100 ha	-4	4 ha showing good growth
7	Kayemba	To renew 100 ha	-	Permit not yet renewed

2.5 Threats and Conflicts

2.5.1 Threats

- (a) Annual bush fires are a very serious threat to the two (2) FRs especially in Katugo causing severe destruction to the plantation. The effect of these fires is in terms of;
 - ✓ Completely destroying parts of the plantation, requiring total replanting.
 - ✓ Retarding tree growth in some planted areas where expected timber volume yield is not achieved
 - ✓ Destruction of vegetation cover to the extent that only fires resistant trees species get adopted or leaving the ground bare vulnerable to soil erosion in woodlands
 - ✓ Increased costs of fire protection, particularly in the pine plantation.
- (b) Cattle grazing, apart from animals trampling and feeding on the grass/young trees/shrubs, cattle grazing are a major contributing factor to annual bush fires, deliberately set by herdsmen to get (fresh) pastures.
- (c) when people increasingly extend cultivation into the reserve from various corners. Farmers are also source of fires during bush clearing, in preparing gardens.
- (d) Settlements, in the entire FRs i.e. Kasagala and Katugo. More detail in Forest Profiles.
- (e) Charcoal burning, involving extensive and indiscriminate trees cutting, in all FRs particularly Kasagala which is easily accessible for product transport.

2.5.2 Conflicts

Conflicts are rising out of misuse/historical trends of the FRs and communities when they (people) claim certain rights.

1. **Kasagala CFRs**- Settlers in Kalungu village (Lc1) claim the area belonged to their ancestors before gazettment. They want part of the FR to be degazetted or people be relocated by Government free of charge.
2. **In Katugo and part of Kasagala**-encroachers, grazers and settlers have to be educated on the roles/functions of forests, possibly given alternatives before they can willingly leave. Otherwise, legal eviction will apply.

Table 14: analyses, assessed stakeholders conflicts

Stockholder's	NFA	Grazers	Charcoal burners	Hunters	Saw milling	Local Government LC 1- 5	Settlers	Encroachers	F/wood collector (local community)
NFA									
Grazers	6								
Charcoal burners	8	2							
Hunters	5	2	2						
Saw milling	2	3	3	4					
Local Government	1	4	3	5	2				
Settlers	7	1	2	6	1	2			
Encroachers	6	2	2	6	1	2	1		
F/wood collector (local community)	4	1	1	2	1	2	1	1	

2.6 Infrastructure

2.6.1 Infrastructure

Katugo MPA has very good staff housing facilities at Katugo, all of them in permanent building materials. Some of the houses need maintenance/repairs, which can be done after assessment of conditions and work to be undertaken. Houses are adequate in number. The building for office accommodation is rather small and there is need for a boardroom. Electricity power line to Migyera passes just in the compound of Katugo office, making installation of electricity supply easy and cheap for other houses. However, only 2 houses have been connected to power supply. Table 15 below shows the lists of buildings

Table 15: Existing Buildings at Katugo Forest Station

Item	Units	Condition	Remarks
Office	1	Renovated (FRMCP)	
Guest House	1	Fair	Needs minor renovation
Residence	8	1 Good, 1 Fair and others in bad conditions.	One renovated (FRMCP) and used by Plantation Manager. The rest need renovation.
Labour line	4 Blocks	Fair	Used by workers. Each block has 5 rooms, except one with 4 rooms.
Uni-ports	4	3 are fair, and 1 has broken top	1 used as a store, 1 used by the Night watchman, 1 store.
Generator Houses	2	New, and working	One for the Nursery, one for the Office.
Pumping House	1	Newly installed	For the Nursery
Potting shade	1	New	For Potting in the Nursery
Office block with a store	1	New	For the Nursery
Water Tank	1	New	For the Nursery

2.6.2 Roads

Both Katugo and Kasagala are well served by the Kampala –Gulu highway, thus easing transport and communication with head quarters. Nakasongola has good murrum road network to reach forest reserves although some roads are not easily passable during rain seasons.

2.6.3 Vehicles

The following is the lists of vehicles in Katugo MPA:

- Land Cruiser pick up still new and in good working conditions for the Plantation Manager.
- 5 Motorcycles: One Yamaha 125 DT motorcycle for the Sector Manager; 2 Honda 125 motorcycles and 2 Honda 110 Trail motorcycles for the Forest Supervisors. All these motorcycles are in good working condition.

2.6.4 Staffing

NFA management and staffing arrangement is not following political jurisdictions, e.g. sub-county or district boundaries but on field activities of a specified area. The staffs are composed as indicated in the table below:

Table 16: NFA Katugo MPA staff list

Designation	No.	Responsibilities	Salary Rates
Plantation Manager	1	Overall in-charge	1,545,000
Sector Manager	0	In-charge Sectoral activities (MPA)	1,030,000
Forest Supervisors ¹	4	In-charge of beats	515,000
Transport Assistants	2	Operating tractors/ driving	319,300
Total	7		

¹.

2.6.5 Labour

NFA does not recruit/engage workers on casual/ semi or permanent terms but all activities are on contract basis. Patrolmen are engaged on contract basis who carry out checking of illegal activities in designated area(s) of work. Similarly other workers are also contracted to carry out activities as need arises.

2.7 Revenue and expenditure

2.7.1 Revenue

In the past FD was collecting revenue from various sources e.g. Katugo plantation, woodland, user tax etc. and compiling details for the whole Nakasongola district. It is therefore difficult to isolate revenue from forest reserves, except round wood and resin from Katugo as indicated in table 17.

It is evident that round wood and resins alone were the highest sources of revenue, accounting for 83.3% of total revenue.

2.7.2 Expenditure

Information available indicated that Government (MWLE) was not allocating adequate funds to FD because the department was expected to be divested anytime. Consequently, FD did not send sufficient money to Nakasongola district almost “starving” them. During 2002/2003, there were specific tending operations in Katugo plantations supported by NORAD funds.

Table 18 shows expenditure details for period 2000/01-2005/March 06

200/01	2001/02	2002/03	2003/4	2004/5	2005- Mar 06	TOTAL
5,697,324	1,400,00	6,367,200	?? ²	123,214,752	223,704,763	

² No available record got for the year 2003/ 4 from the office.

Table 17: Revenue collected / accruing during period 2000/2001- 2005/2006 in Ushs.

Product	2000/01	2001/02	2002/03	2003/04	2004/05	2005- March 06	Total
Round wood	36,354,320	50,057,534	130,500,000	439,097,306	111,728,448	488,531,994	1,256,269,602
Resins	-	250,000	565,000	-	-	-	815,000
Off-cuts	-	-	-	-	10,649,250	815,000	11,464,250
Illegal grazing	-	-	-	-	1,132,000	1,025,000	2,157,000
Poles	-	-	-	-	5,000		5,000
Seedlings	-	-	-	-	3,540,000	32,063,000	35,603,000
Pine soil	-	-	-	-	230,100		230,100
Land Application	-	-	-	-	4,200,000	104,000	4,304,000
Felling fees	49,000	36,000	27,000	-	-	-	112,000
User's tax	3,697,490	2,357,975	2,357,975	-	-	-	8,413,440
Charcoal	21,9000	12,356,000	66,000,000	-	-	-	78,575,000
Miscellaneous.	10,000	336,000	60,000	1,948,070	150,000	62,000	2,566,070
TOTAL AMOUNT	40,329,810	65,393,509	199,509,975	441,045,376	131,634,798	522,600,994	1,400,514,462

Source: FD/NFA Records Katugo office

CHAPTER 3: ENVIRONMENTAL CONSIDERATIONS

3.1.0 Environmental Profiles

Climatic conditions are rather harsh and vegetation (as described above) is adapted to such a situation. The watershed function is therefore attributed to Nakasongola, which contribute to the water flow system. Lugogo River and Namwanga swamp are water reserves within Katugo and Kasagala forest reserves respectively.

Environmental degradation is a serious issue due to: -

1. Excessive tree cutting, say 'deforestation' is now a serious problem, resulting from charcoal production.
2. Cattle grazing because the level of cattle keeping is quite high in all areas. As there is inadequate pasture for grazing, cattle owners deliberately set fires in anticipation of fresh grass, particularly during dry seasons.
3. Many cattle keepers are landless thus grazing in the forest reserves. Cattle movement hardens the ground, which in combination with deforestation exposes the soil to surface water runoff and soil erosion.

3.1.1 Biodiversity Status and Function

Only Kasagala CFR was identified and included in the Uganda Forestry Nature Conservation Master Plan (FNCMP) because it supports:

- ✓ At least one unique tree species of conservation importance on (Albertine rift endemic);
- ✓ Vegetation types W2 (*Sorghastrum* Grassland) not otherwise represented in the protected area system of Uganda-including Uganda National Parks.

Kasagala falls under category: SECONDARY conservation forest in the FNCMP classification. Table 19 summarises the biodiversity values based on the inventory indicators taxa.

Although Kasagala has limited biodiversity richness, those existing play significant functions.

Animals and insects are agents for seed dispersal.

- Trees, shrubs and grasses are important sources of medicinal herbs, which rural communities constantly use.
- Katugo MPA and the district as a whole are generally a dry area where trees/shrubs are important in climate mitigation.
- Katugo plantation and savannah woodland forest reserves are sources of various wood products for commercial and domestic use, especially as income-generating opportunities.

Table 19: Summary Table of Biodiversity Values for Kasagala

Criterion	Trees and shrubs	Birds	Mammals	Butterflies	Moth	Overall
Total No. Of spp known	164	119	21	76	39	419
No. Of restricted rang spp (known from \leq 5 forests)	9	4	0	2	0	15
Spp unique to the forest	<i>Vernonia iodocalyx</i> , <i>Viscum bagshawei</i>	None	None	<i>Pilodeudoria caerulea</i>	None	3
Uganda endemics (list)	None	None	None	None	None	0
Albertine rift endemic (list)	<i>Grewia pubescens</i>	None	None	None	None	1
Species diversity (score and rank)	5.3(40=)	6.8(18=)	6.7(22=)	6.6(30=)	6.5(15=)	5.7(33=)
Species rarity value (score and rank)	7.2(29=)	5.2(34=)	4.8(35=)	4(55=)	3.5(38=)	6.0(39=)

Overall biodiversity score =12

Source: *Forest Nature Conservation Master Plan, June 2002.*

3.2 Wetlands, Rivers/ streams banks and lakeshores

The wetlands and rivers/ streams banks will be protected by leaving a belt of 10-15 metres along the sides to minimise the effect of soil erosion and siltation of the water bodies, as well as maintaining the efficacy of the water catchments. Strict measures will be taken to ensure that these water bodies are not encroached and degraded as result of cultivation and settlement.

3.3 Vulnerable/ ecologically fragile areas (such as Steep slopes)

Road construction on steep slopes shall follow contour lines to minimise soil erosion and logging on steep slopes will be within one harvesting period and thereafter must be replanted immediately.

3.4 Social-cultural sites

The forest reserves do not have socio-cultural sites but the local people do collect herbs from these reserves.

CHAPTER 4: HISTORY OF MANAGEMENT

4.1 Past Management Plans

The reserve was reserve in 1963 and the original plan was to plant 400- 600 ha of pine per year in Katugo and the neighbouring Kasagala Forest Reserves (10,298 ha) in order to achieve adequate supply of raw materials for pulp wood plant that was to be established in Jinja

Another plan for Katugo Plantation was developed for the Period 2001- 2024. The objectives of Reservation were as follows

- a) Profitable production of timber, and other forest products in perpetuity.
- b) Provision of environmental services such as protection of the water catchments, climate amelioration, and carbon sequestration etc.
- c) Conservation of Bio-diversity through provision of alternative source of Forest Products.
- d) Provision of income to local communities through employment

4.2 Existing Zonation of Katugo Forest Reserve

Currently the Forest Reserve is zoned as Production Forest. There are three distinct sub-zones within this, namely: See Appendix A for more details

1. Plantation Zone.
 - a) Planted Areas 2,231 ha
 - b) Firelines 83.7 ha
 - c) Roads 39 ha
 - d) Unplanted Areas 437.9 ha
2. Residential Area. 19.9 ha
3. Swamps (outside plantable area). 506.5 ha
- Total 3318 ha

zonation in Kasagala forest reserve comprises of the following zones

- a) Nature reserve 2100 ha
- b) Protection (buffer) 1000 ha
- c) Production 7198 ha
- Total 10,298 ha

4.3 History of use of the resources

The history of the use of resources for both Kasagala and Katugo Forest Reserves is indicated in the Appendix 2 & 3

4.4 Past silvicultural practices

The first trial of conifer planting began in 1964. Broad-leaved trail of *Maesopsis eminii* and *Terminalia ivorensis* was also carried out around the same time. Extensive planting started in 1966 with mainly *P. caribaea*, *P. oocarpa*, *P. Kesiya*, and *P.markussii* The extension of plantation continued to 1976. The

entire crop was neither thinned nor pruned. The best performers have been *P. caribaea*, and *P. oocarpa*.

4.5 Past Prescription of Katugo Plantation

Period 1964 to 1976

The original objective was the supply of raw material for a pulp wood plant. This was to be achieved through the following prescriptions (among others) namely:

- Maintaining production and research working circles.
- All planting were carried out mainly with *P. caribaea* and *P. oocarpa*
- Carry out initial clearing in November and December. Burn the larger trees into charcoal in the Missouri and Mark II kilns.
- Plant direct in the grassland after bush clearing, lining out, staking at a horizontal espacement of 2.7 m x 2.7 m, start pitting in February and plant during March/ April.
- Planting with the 10- 11 months old Pine seedlings in early rains and beating up in the September rains.
- Tend by weeding (Spot hoeing), line slashing and climber cutting at most.
- Establishment of unplanted firebreaks (Total of 83.7 ha) 10 m wide within compartments and 20 m wide between compartments. Maintain an unplanted external boundary (30 m wide) of about 42.0 km.
- Establish external road along the boundary to assist in fire protection. Prepare the external firelines at the onset of the dry season.
- Establish fire towers and instant communication by Telephone or Radio between patrolmen, fire towers and station. Watch for 12 hours and 24 hours when dry conditions become severe.
- Install static water tanks, fire fighting equipments (Fire beaters, Knapsack pumps, water tanks etc.)
- Maintain existing seasonal and unplanted areas.
- Establish 19. 5 kms of roads for access, inspection, fire protection and extraction/ exploitation (along boundary, between compartments etc.).
- Manage the plantation at Rotation of 25 years.
- Maintain meteorological records.

Replanting in the Katugo Plantation:

Replanting started way back in the early 1990's by the Saw-millers, who were operating in the Katugo Forest Plantation. As a condition for renewal of licenses for harvesting in the plantation, it was mandatory that the saw-millers operating in the Forest must plant. However, in the year 2001, FRMCP also carried out some replanting. The total area under Immature Crops in Katugo was 176.6 ha.

Planting Year	Planting month	CPT	Status	Species	Area Mapped	Planted by	Seed Origin	Condition
1991	April	15	IM	<i>P. Caribaea</i>	10	FD (FRP)		Partly burnt
1992	April	15	IM	<i>P. Caribaea</i>	10	FD (FRP)		Partly burnt
1993	April	15	IM	<i>P.oocarpa</i>	5	FD (FRP)		Partly burnt
1994	April	1	IM	<i>P. oocarpa</i>	20	FD (FRP)		Good
1998	April	1	IM	<i>P. oocarpa</i>	6	Ndyagenda		Partly burnt

						Sawmill		
1998	April	3	IM	<i>P. Carribaea</i>	15	Ndyagenda Sawmills		Burnt Feb1999
1998	April	4	IM	<i>P. Caribaea</i>	11	NARO		Burnt Feb1999
1998	April	6	IM	<i>P. Caribaea</i>	37	Nile Ply		Partly burnt Feb 2000
1998	April	7	IM	<i>P. Caribaea</i>	40	FMB Sawmillers		Burnt
1998	April	8	IM	<i>P. Caribaea</i>	24	Katugo sawmillers		Burnt
2001	April	1	YC	<i>P. Caribaea</i>	4.8	FRMCP	SA/TZ	Burnt Feb 03
2001	April	2	YC	<i>P. Caribaea</i>	24.8	FRMCP	SA/TZ	14 Ha Burnt Feb 03
2003	April	6	YC	<i>P.caribaea.</i>	14	FRMCP		
2004	October	6	YC	<i>P. caribaea</i>	8	NFA		
2004	October	6	YC	<i>P. oocarpa</i>	32	NFA		
2004	October	7	YC	<i>P. caribaea</i>	100	NFA		
2004	October	8	YC	<i>P. oocarpa</i>	30	NFA		
2004	October	8	YC	<i>P. caribaea</i>	87	NFA		
2004	October	9	YC	<i>P. caribaea</i>	11	NFA		
2005	April	2	YC	<i>P. oocarpa</i>	27	NFA		
2005	April	2	YC	<i>P. caribaea</i>	28.3	NFA		
2005	April	3	YC	<i>P. oocarpa</i>	6	NFA		
2005	April	3	YC	<i>P. caribaea</i>	29	NFA		
2005	April	4	YC	<i>P. caribaea</i>	89	NFA		
2005	April	5	YC	<i>P. oocarpa</i>	12	NFA		
2005	April	5	YC	<i>P. caribaea</i>	68	NFA		
2005	April	6	YC	<i>P. caribaea</i>	78	NFA		
2005	April	8	YC	<i>P. caribaea</i>	61.2	NFA		
2006	April	5	YC	<i>P.caribaea</i>	15	NFA		
2007	October	15	YC	<i>P.caribaea</i>	26	NFA		
2007	October	8	YC	<i>P.caribaea</i>	10	NFA		
2007	October	7	YC	<i>P.caribaea</i>	15	NFA		
2008	April	1	YC	<i>P.caribaea</i>	4.8	NFA		
2008	April	15	YC	<i>P.caribaea</i>	33	NFA		
2008	April	12	YC	<i>P.caribaea</i>	30	NFA		
2008	April	9	YC	<i>P.caribaea</i>	34.5	NFA		
2008	April	10	YC	<i>P.caribaea</i>	28	NFA		
					1084.4			

Table 20: Immature Crop Area Statements for Katugo Plantation (Replanted):

Source: FD/ NFA Katugo Records

Key:

YC; Crop that is less than ten years is referred to as Young Crop.

IM; Crop that is 10 years but less than 20 years are referred to as Immature Crop

PART 2: PLANNED MANAGEMENT

CHAPTER 5: BASIS OF THE PLANNED MANAGEMENT

5.1 Basis of the Plan

Katugo will be developed as a demonstration/research plantation. The young plantation in Katugo was established as a model for training and demonstration of best practices in accordance with the Financing Agreement between Government of Uganda and European Union. It will therefore be managed as a model profitable enterprise. The whole production chain from nursery through plantation management, wood processing to the seasoning of milled timber will be considered.

Kasagala and Katugo forest reserves were reserved in 1963 for the sole purpose of establishing plantations in order to produce saw timber to meet the ever rising demand for industrial timber. Nakasongola district is one of the areas of the country where the standard of living is very low. Investment in tree planting by NFA and other private planters will provide employment to the communities in this area. The savanna woodland, the dominant vegetation type, has for many centuries supported the local communities by providing raw material for charcoal production, but the woodland is being harvested unsustainably and the time has come when charcoal production can no longer provide employment as it has done for many decades. Another source of income generating activity is urgently required in this area.

5.2 Management Circles

There will be three management circles: **Prescription 1**

- A. The sawlog production circle covering about 8000 hectares in Katugo and Kasagala, by NFA, private tree planters and the community.
- B. Sustainable charcoal production circle covering 2000 ha to be managed by NFA in partnership with the local community and private sector in Kasagala.
- C. The conservation working circle for indigenous vegetation and biodiversity in Kasagala F.R nature reserve and ecologically sensitive areas management circle. This will take up 3100 ha of the northern part of Kasagala reserve. The area includes the Strict Nature Reserve 2100 ha and the bufferzone 1000ha

5.3 Objectives of management

The objectives of managing these reserves are:

- a) To develop and manage Katugo as a model profitable enterprise whereby the production chain from nursery through plantation management, wood processing to the seasoning of milled timber will be followed.
- b) To produce sawlogs by planting fast growing tree species which mature within a period of 20 – 25 years.
- c) To provide for sustainable charcoal production using modern kilns of higher conversion efficiency, in partnership with the local communities and private sector under the Clean Development Mechanism.

- d) Conservation of the indigenous vegetation type which does not occur elsewhere in the country even in the protected areas, the National Parks and protect biodiversity associated with such unique vegetation as found in Kasagala forest reserve.

5.4 Immediate Objectives

- Replant all unplanted, clear felled, areas in Katugo
- Establish and manage Kasagala plantation by NFA, private investors and local communities.
- Achieve better resource use in raw material utilization
- Increase natural vegetation cover for ecological amelioration and biodiversity conservation.
- Protection of water catchments
- Promote education awareness on forest management and benefits
- Participate in research programmes.

5.5 Opportunities of the FRs

Local community

During consultations with communities adjacent to FRs, the followings were identified as the opportunities arising from the Forest Reserves:

- Access to land for tree planting near the market outlets
- Plantation Development Fund (SPGS)
- Employment opportunity for local community in the plantation development
- Supply of forest products to meet the need of local communities
- Good terrain for field work
- Aesthetics and beauty

5.6 Period of the Plan

This plan for Katugo and Kasagala reserves will remain valid for a period of twenty (20) years from 1/7/2008 to 30/6/2028.

It shall be reviewed every five (5) years in a participatory manner with communities and key stakeholders to cope up with forest management and related needs. **(Prescription 2)**

CHAPTER 6: PLANNED MANAGEMENT ACTIVITIES

6.1 Production

The long-term aim to produce a sustainable yield of round wood by attaining and maintaining forests that are approximately normal in terms of areas of different age gradation in order to obtain regular supplies of timber for wider market and local communities use. To attain this, the annual volume to be cut shall be regulated and approximately equal to the annual increment. (**prescription3**)

6.1.1 Clear-felling Programme

Clear felling will be concentrate in areas, which reached the rotation age. Clear felling will be done by NFA and individual customers after buying wood of standing volume. (**prescription 4**)

6.1.2 Thinning programme

Thinning will be carried out twice in order to remove poorly formed trees, so that the stands produce only large, high quality trees which can be sold at a premium price. (**prescription 5**)

Thinning regime for Pine, if it is planted at the spacing of 3 m x 3 m.

Table 21: Thinning Regimes for Pines

Thinning	Age	Stems left
1 st	5 to 7	700-800
2 nd	10 to 12	400-500

Source: NFA Plantation guidelines No.26

Thinning operations will provide an intermediate first return. Whilst the trees from the first thinning operations will often be too small to have much value, those from the later (2nd) thinning will be of useable size. Because the remaining trees are provided with more space for crown and root development this encourages stem diameter growth and thus the desired size sooner.

Trained contractors under close supervision of the Forest Supervisor in-charge will carry out thinning in the plantation. Cross cut saw, axes, bow saw and power saws will be used in carrying out thinning. (**Prescription 6**)

Table 22: schedule for Thinning

Plantations	Cpt.	Planting year	Species	Area (ha)	1 st Thinning year	2 nd Thinning year	Remarks
Katugo plantation	1	2001	<i>P. oocarpa</i>	7	2006	2012	
	2	2001	<i>P. oocarpa</i>	23	2006	2012	
	6	2003	<i>P. caribaea.</i>	14	2008	2014	
	6	2004	<i>P. caribaea</i>	8	2009	2015	
	6	2004	<i>P. oocarpa</i>	32	2009	2015	
	7	2004	<i>P. caribaea</i>	100	2009	2015	
	8	2004	<i>P. oocarpa</i>	30	2009	2015	
	8	2004	<i>P. caribaea</i>	87	2009	2015	
	9	2004	<i>P. caribaea</i>	11	2009	2015	
	2	2005	<i>P. oocarpa</i>	27	2010	2016	
	2	2005	<i>P. caribaea</i>	28.3	2010	2016	
	3	2005	<i>P. oocarpa</i>	6	2010	2016	
	3	2005	<i>P. caribaea</i>	29	2010	2016	
	4	2005	<i>P. caribaea</i>	89	2010	2016	
	5	2005	<i>P. oocarpa</i>	12	2010	2016	
	5	2005	<i>P. caribaea</i>	68	2010	2016	
	6	2005	<i>P. caribaea</i>	78	2010	2016	
	8	2005	<i>P. caribaea</i>	61.2	2010	2016	
	5	2006	<i>P. caribaea</i>	15	2011	2017	
	15	2007	<i>P. caribaea</i>	26	2012	2018	
	8	2007	<i>P. caribaea</i>	10	2012	2018	
	7	2007	<i>P. caribaea</i>	15	2012	2018	
		Total			776.5		
Kasagala plantation		2002	<i>P. caribaea</i>	10	2007	2013	
		2003	<i>P. caribaea</i>	14.8	2008	2014	
		2003	<i>P. oocarpa</i>	2	2008	2014	
		2003	<i>P. oocarpa</i>	5.4	2008	2014	
		2004	<i>P. caribaea</i>	30	2009	2015	
		2004	<i>P. oocarpa</i>	14	2009	2015	
		2005	<i>P. caribaea</i>	7.4	2010	2016	
		2007	<i>P. caribaea</i>	23	2012	2018	
Total				106.6			

Source: FD/ NFA Katugo Office Records

Table 23: Thinning schedule for Immature Crop

CPT	Replant Year	Species	Area (ha)	1 st Thinning Year	2 nd Thinning Year	Remarks
2	1994 & 2001	<i>Pinus oocarpa</i>	51	Not done	2006/09	1 st thinning overdue for 1994 planting-combine activity
6	1998/ 99	<i>Pinus oocarpa</i>	37	2005	2008/ 10	
7	1998/ 99	<i>Pinus oocarpa</i>	47	2006/ 07	2011/ 12	
8	1999	<i>P. caribaea / P. oocarpa</i>	48	2006	2010/ 11	
Total			183			

Source: FD/ NFA Katugo Office Records

6.1.4 Extraction

6.1.5 Harvesting

Currently, there is only Nile Ply that is harvestings round logs in Compartment 9, while NFA Saw Mills are operational in Compartments 10 and 15. Apart from these, there are no active saw milling activities on the ground.

6.1.6 Thinning for seeds stands

Thinning is taking place in compartment 15 of Katugo Forest Reserves with the view of establishing seeds stands. An area of 30 ha has been demarcated, and trees of good quality with desirable characteristics have been marked for future seed source and the rest thinned by Nile Ply to provide round wood for making Plywood. Close to 2,400 m³ of trees have been removed in the 8 ha leaving behind the seed trees.

Standing Volume

Volume Assessment for every compartment was done using random sampling within each Compartment in May 2005. Basal area sweeps were done using a Relascope (Ludde). Height measurements were also carried out.

The assessment revealed that the net remaining stocked area is 861.9 ha. Some compartments were clear felled or partly felled and planted/not planted. According to available records, about 2,080.1 ha was originally planted *Pinus caribaea* (1804.4 ha), *P. oocarpa* (217.4 ha) and other pines (52.3 ha) plus other species (6.0 ha)

Net standing volume was computed from gross volume after deduction of bark and waste. The net standing volume (under bark) was assessed to be 283,041 cubic metres averaging 328 m³ per hectare.

Harvesting and Yield Control

NFA carried out Forest Plantation Assessment and Harvesting Plan Update, May 2005. The crop is generally in good condition apart from about 60 ha affected by

resins tapping which could pose a threat to fire risk. The crop is also generally the youngest in the country (30 to 33 years); most of it having been planted in the 70's.

In all saw-milling operations, conserving the standing volume is essential. Management shall consider, among other things:

- The area earmarked for felling will be demarcated into felling coupes of 5 ha each, averaging 350m³ per ha.
- To limit the number of saw millers to the optimum with annual allowable cut (AAC) commensurate with machinery for sustainable harvesting.
- Close supervision of both harvesting and milling operations, for maximum resource utilization.
- Replanting a cut- over compartment to be done in a period not exceeding two (2) years.

Detailed Harvesting Plan:

A detailed harvesting plan has been drawn from the above scheduling and is presented in tabular format below: It covers the period 2005- 2010.

Table 24: Detailed Harvesting Plan Indicating Annual Removals

Cpt. No.	Year Planted	Species	Age	Volume	Harvest Volume	Remaining Volume	Year of Harvest
8	1973	<i>P. caribaea</i>	33	3,250	3,250	0	2005- 2006
9	1974	<i>P. caribaea</i>	32	19,459	19,459	0	2005- 2006
9	1974	<i>P. caribaea</i>	32	43,661	21,000	22,661	2006- 2007
9	1974	<i>P. caribaea</i>	32	22,661	22,661	0	2007- 2008
10	1974	<i>P. caribaea</i>	32	35,038	35,038	0	2007- 2008
11	1974	<i>P. caribaea</i>	32	70,804	29,000	41,804	2007- 2008
11	1974	<i>P. Caribaea</i>	32	41,804	20,000	21,804	2008- 2009
11	1974	<i>P. caribaea</i>	32	21,804	21,804	0	2009- 2010
12	1975	<i>P. caribaea</i>	31	23,546	23,546	0	2009- 2010
12	1975	<i>P. caribaea</i>	31	53,546	30,000	23,546	2008- 2009
13	1975	<i>P. caribaea</i>	31	15,470	15,470	0	2008- 2009
15	1976	<i>P. caribaea</i>	30	40,613	40,613	0	2008- 2009
Total		<i>P. caribaea</i>		391,656	281,841	109815	

Source: Inventory Report November 2005

6.2 Silvicultural programme

6.2.1 Seedlings production

Seedling production will be done at Katugo Nursery. (**Prescription 7**)

Good nursery work (practices) will be required to raise good quality seedlings, which greatly contributes to plantation vigour and development.

- Local seeds will be procured from NFA National Tree Seed Centre, Namanve or imported seeds to be used in seedling production. (**Prescription 8**)
- Pots for seedling production shall be the same material and size.

- Good practices e.g. regular watering, changing shed, root pruning, weeding, etc shall be carried out.
- Removing stunted seedlings (curling) is essential to raise only healthy seedlings destined for planting.
- Insecticides/ fungicides should be carefully applied to comply with NEMA rules and regulations.

Planned planting target of 400- 500 Ha. /year will require 511060 - 638825 seedlings. This includes 15 % for curls and beating up.

The nursery in Katugo is expected to raise seedlings for NFA planting in Katugo, Kasagala and other Ranges and possibly for some investors.

Nursery management shall be under trained and experienced managers with hands on attitude.

- Labour shall have some working knowledge.
- Nursery inputs shall be promptly availed, e.g. soil mixtures, seeds, polythene tubes.
- As seed sowing is direct on to the pots, pine seedlings shall be taken out early enough for planting (4-5 months in the nursery) to develop the root system in the field.
- A filtering mechanism for the water pump at the new dam is recommended as the water is not clean. The system has to be regularly checked to avoid any blockage

6.2.2 Stand Establishment

In the new planting areas, a compartment shall be 25 –30 Ha. (Prescription 9)

Large compartments in Katugo plantation shall therefore be examined, to re-demarcate them into small compartments as conveniently as possible. Timely bush clearing, lining out and pitting are pre-requisite in order to effect early planting in a rainy season.

- Lining out and pitting shall maintain a straight line in all directions.(prescription 10)
- Spacing will be 3m x 3m for pines giving 1,111 stems/ha unless otherwise directed by relevant authorities.
- A pit 30 cm x 30 cm x30 cm shall be prepared for planting of seedlings.

Replanting of areas that have been harvested but not yet replanted shall be dealt with first before attempting to clear the bush for afforestation of new areas at Kasagala and Katugo. When all the areas which have been harvested ,including some of the 861.9ha which carry a mature crop to be harvested during the same financial year have been planted up, then planting will be carried out on new areas which have been planted before. The area to be replanted is quite small only about 556ha which can be replanted during the first two years of this FMP

Planting

- The planting shall be done in two seasons i.e. April – May and September/ October. However April-May season shall be the main one.
- Planting shall be done carefully to achieve high survival
- Beating up shall be in the same season or done early the following season.

6.2.3 Weeding

Weeding shall be done in the young crop to ensure that the crop is free from competition. Weeding shall be done by chemical method, manual or both.

1. Chemical method

The most commonly type of herbicide that will be used is Glyphosate, under different names such as Roundup, Mamba, Kalach and Pin up. Glyphosate herbicide will be applied at 4-5 litre/ha in pre planting spraying.(prescription 11) This is done along a pitted line immediately before planting (within 24-48 hours) which gives about 3 months free of weed after planting. Post – planting spraying is to be carried out and the seedlings /plants have to be covered with cylindrical cones and care shall be taken to prevent chemical side effects on human life.

2. Manual method:

Where manual / hand weeding is to be done slashing and spot hoeing shall be done in the first year, then spot hoeing and line slashing in the second and third year. (Prescription 12)

The site will dictate the type of weeding required. The intensity of weeding will depend on the aggressiveness of the weed. Weeding shall be done towards the end of the wet season to reduce the fire risks.

6.2.4 Pruning

Pruning will be carried out to facilitate easy access through the plantation and to produce knot free timber of the final crop (prescription 13).

Pruning shall be done just before a rainy season, to ensure fast scar occlusion.

Pinus caribaea and *Pinus oocarpa* generally have small branches. - 1st pruning (access) to 2m will be done when trees are 4-5 years old.

1st high pruning to 4m high will be done when trees are about 6- 7 years old.

2nd high pruning to 7m will be done when trees are about 9 - 10 years old.

3rd high pruning to 10m high when trees are 12 – 13 years old.

Pruning shall always be done after thinning, to avoid pruning stunted and deformed trees to be thinned. A sharp pruning saw, and a ladder for higher pruning are recommended rather than a panga or a hatchet which can easily damage the tree.

Table 25: Schedule for Pruning

	Cpt	Planting year	Species	Area (ha)	1 st pruning year	2 nd pruning year	Remarks
Katugo Plantation	1	2001	<i>P. oocarpa</i>	7	2005	2011	
	2	2001	<i>P. oocarpa</i>	23	2005	2011	
	6	2003	<i>P. caribaea</i>	14	2007	2013	
	6	2004	<i>P. caribaea</i>	8	2008	2014	
	6	2004	<i>P. oocarpa</i>	32	2008	2014	
	7	2004	<i>P. caribaea</i>	100	2008	2014	
	8	2004	<i>P. oocarpa</i>	30	2008	2014	
	8	2004	<i>P. caribaea</i>	87	2008	2014	
	9	2004	<i>P. caribaea</i>	11	2008	2014	
	2	2005	<i>P. oocarpa</i>	27	2009	2015	
	2	2005	<i>P. caribaea</i>	28.3	2009	2015	
	3	2005	<i>P. oocarpa</i>	6	2009	2015	
	3	2005	<i>P. caribaea</i>	29	2009	2015	
	4	2005	<i>P. caribaea</i>	89	2009	2015	
	5	2005	<i>P. oocarpa</i>	12	2009	2015	
	5	2005	<i>P. caribaea</i>	68	2009	2015	
	6	2005	<i>P. caribaea</i>	78	2009	2015	
	8	2005	<i>P. caribaea</i>	61.2	2009	2015	
	5	2006	<i>P. caribaea</i>	15	2010	2016	
	15	2007	<i>P. caribaea</i>	26	2011	2017	
8	2007	<i>P. caribaea</i>	10	2011	2017		
7	2007	<i>P. caribaea</i>	15	2011	2017		
	Total			776.5			
Kasagala Plantation		2002	<i>P. caribaea</i>	10	2006	2012	
		2003	<i>P. caribaea</i>	14.8	2007	2013	
		2003	<i>P. oocarpa</i>	2	2007	2013	
		2003	<i>P. oocarpa</i>	5.4	2007	2013	
		2004	<i>P. caribaea</i>	30	2008	2014	
		2004	<i>P. oocarpa</i>	14	2008	2014	
		2005	<i>P. caribaea</i>	7.4	2009	2015	
		2007	<i>P. caribaea</i>	23	2011	2017	
Total				106.6			

Source: FD/ NFA Katugo Office Records

Fire control

The Nakasongola District with characteristics of semi-arid climate, needs concise fire protection measures, to safeguard development of pine plantations. Forest

Reserve boundaries are bushy in all CFRs, which probably attract people to engage in illegal activities. Seasonal bush fires are common in all grass/ woodland areas, while in Katugo plantation arson was frequently reported. Bad working relations with communities is a very serious matter and can be a contributing factor to fires- as revenge by the aggrieved persons. Katugo plantation and Kasagala planted area are quite vulnerable to any kind of fire, particularly during dry seasons. The key areas that will be focussed on to make the forest safer is:

- a) Sector Manager Katugo shall periodically organise and conduct seminars to inform communities on risks and effects of fires.(prescription 14)
- b) At the beginning of the dry season:
 - i) The Katugo MPA personnel shall draw a fire protection programme and give it wide publicity to partners/ stakeholders;
 - ii) A fire boss will be appointed on weekly basis, who will be in charge of monitoring any fire out break. (prescription 15)
 - iii) Purchase and maintenance of suitable fire fighting equipment
 - iv) Static tanks shall be renovated, maintained and filled with water during dry season. The tanks shall be checked and cleaned to keep water when filled. New valley tanks shall be established as need arises;
 - v) All surrounding boundaries and fire lines within the plantation shall be slashed/ cleared of grass/ shrubs; and herbs. (prescription 16)
 - vi) Staff (including contractors, i.e. Fire patrol persons and fire fighting gang will be trained
 - vii) Early burning shall be organised, where feasible.
 - viii) Fire Danger Index System will be used to guide levels of preparedness.(prescription 17)
- c) At the peak of the Fire season, the following measures shall be available;
 - A fire fighting crew shall be on the stand by with tools/ equipment, on 24-hour alertness (prescription 18)
 - Walkie-talkies/ mobile phone shall be readily available for easy communication among staff, for direction, etc.
 - The MPA staff shall strive to maintain good working relation with communities for mutual benefits. All communities shall be alerted and requested to cooperate in fire fighting;
 - NFA Headquarters shall construct fire tower (at least 35- 40 m high) initially for Katugo and part of Kasagala at a high point from where much of the plantations can be viewed/ controlled. (prescription 19)
 - NFA shall provide adequate funds for timely preparation by Katugo MPA personnel, in organising fire precautions.

Fire protection measures prescribed above shall apply to both Kasagala and Katugo Plantations.

6.3 Road construction and Maintenance programme

6.3.1 Road construction and Maintenance:

- A road network shall be developed to facilitate communication in the forest (Prescription 20)
- New roads shall be aligned along contours as much as possible.
- Road works involving excavation, bridges/ culverts, must conform to NEMA regulations
- Murram shall be put in areas, which are badly damaged.
- Roadwork shall be done mechanically or manually and available tractor shall assist in the transporting excavated murram.

6.4 Forests Protection against illegal activities

6.4.1 Savannah Woodland Management Programme

The savannah woodland management programme shall cover the whole unplanted area of Kasagala.

The savannah grass/ woodland forest regenerates and grows naturally without any intervention by human activity. However, there is need to protect this forest against damage and destruction by various actions of adjacent communities.

- Domestic animals feed on/ browse tender leaves of many wood species.
- In course of movements, animals trample on young regenerating seedlings/ saplings.
- In many instances, there is overgrazing which is in combination with constant movement of animals which loosen the soil subjecting it to surface running water resulting into soil erosion.
- Where animals must access water points, agreement with cattle owners shall be reached for control and measures put in place.

The savannah grasses/woodlands are quite productive taking into account the vegetation and expected forest products. Other non-timber forest produce e.g. building poles, grass for thatching, craft materials, fencing poles, etc. all come from this vegetation category.

It is therefore absolutely necessary during this programme that NFA shall strengthen and enhance management of these FRs. FD did not provide adequate management for these FRs but concentrated on Katugo Plantation. Management activities shall include protection measures, prescribed under this programme

5.6.1 Sustainable charcoal production

Sustainable charcoal production will be carried in Kasagala forest reserve covering an area of approximately 2000 ha. It will involve the planting of suitable broadleaved, short rotation tree species for purposes of charcoal production. (Prescription 21)

Sustainable charcoal production will involve the use of modern kilns of higher conversion efficiency, in partnership with the local communities and private sector under the Clean Development Mechanism. NFA will initiate this programme as a pilot demonstration for sustainable production of charcoal as opposed to the wasteful and inefficient method of earth kilns used currently.

5.6.2 Forest Plantation Protection against illegal grazing

The ethnic composition of Nakasongola District includes among others the Baruli, Banyarwanda and Bahima who are cattle keepers; and most of them are nomadic pastoralists. Some of these pastoralists prefer to graze their cattle in the younger plantations, where pasture is still fresh yet these animals browse and trample on the trees, hence destroying them. Measures that will be taken shall include:

- a) Emphasising to the local communities the importance of forest to them and to avoid grazing in the plantation.
- b) Recruitment of patrol persons who patrol and safeguard plantation from illegal grazing.
- c) An appropriate fine of not less than shillings 5,000/= per head of cattle shall be maintained and continue to be imposed on the illegal grazers in the plantation.

6.4.4 Forest Reserve Boundaries

Boundary patrols/ inspection shall be carried out frequently in order to discourage illegal activities.

- Resurvey and demarcate all FR boundaries as already expressed by the lands and survey department. All boundaries have to be geo-referenced for future tracing / location of FR'S (prescription 22)
- The boundaries shall be maintained by slashing once every year.
- Strengthen law enforcement in both Katugo and Kasagala

Community livelihood programme

Communities surrounding the 2 FRs practice subsistence livelihood and depend on forest products e.g. firewood, charcoal, grass, poles, herbal medicine, etc. The population increases from year to year yet forest products do not increase at the same rate. In utilising these forest products, the trend is to start with the best by taking large quantities exceeding the immediate needs, i.e. consuming at unsustainable level. Constant resource use depletes the resource base leading to degradation.

The community livelihood programme aims at:

- Using available forest resource/ product at sustainable level
- Provision of alternative sources of products as a relief to FRs base, by communities themselves.
- Creating an understanding among communities through Collaborative Forest Management (CFM) that forest management is a responsibility of all stakeholders.

- Adopting approaches to use resources in the FRs under specific conditions without damaging/ destroying the resource.

Strategies and actions

1. NFA to initiate community awareness on new management and legal limitations, opportunities, difficulties etc.
2. NFA shall encourage and promote tree planting by individuals/ groups of fast growing wood species e.g. *Eucalyptus*, and *Senna* (cassia) for household use and for selling as income generating activities in the fight against poverty.
3. NFA shall encourage communities to undertake small scale planting of Pines either in FRs (Katugo and/or Kasagala) or private land and sell seedlings to them at a nominal fee (production cost).
4. As far as possible, communities shall be given first priority of employment when opportunities prevail.
5. NFA shall encourage communities to grow suitable tree species around their homes which will contribute to:
 - Forest resource development in the district
 - Increase vegetation cover for climate mitigation
 - Increased forest protection as tree farmers will look after their trees while reducing NFA protection costs.
6. NFA shall issue licenses for charcoal burning in Kasagala FR.

5.7 Research programme

For a long time, there have been no visible research undertakings by FD particularly when FD research section was transferred to National Agricultural Research Organisation (NARO)

NFA will need FORRI to revitalise research relating to plantation establishment, wood utilization including tests for working properties, new species to be introduced to the market, etc. NFA shall collaborate with FORRI and other institutions to:

- Examine causes and solutions to the current entomological/ pathological attack on leaves of *Eucalyptus*.
- Undertake a study on methodologies/ techniques to raise seedlings at minimum cost for the planting programme and new breeds, e.g. grafting and cloning.
- Encourage research in establishment and management of seed orchards.
- Encourage/ support PSPs establishment and assessment.

5.8 Partnerships programme

The partnership programme will strengthen and consolidate existing institutional and non-institutional partnerships mentioned in chapter 2. As forestry activities expand and people get more interest, this programme will link and develop approaches between NFA and partners based on CFM principles.

- NFA shall play the lead role in initiating/ developing partnerships

- Partners should, in a participatory process, agree on their roles and responsibilities.
- CFM guidelines (at NFA Headquarters) shall be distributed to all partners as a reference to their activities.
- Operations of partners shall take into account national and international interests to include preserving ecological conditions and biodiversity conservation.
- Communities adjacent to FRs shall be encouraged to take up roles and responsibilities in planning and management of forest resources.
- Partners should have a schedule of meetings to review their field operations, particularly the progress of AWP, preferably every six months.

5.9 Plantation Development

Investors in Kasagala plantation development look at NFA as a source of technical know how and will seek assistance now and again from the NFA staff at Katugo. It is necessary that;

- NFA should clearly demarcate allocated areas to investors (on the ground) with a map indicating:
 - External boundaries (width) for fire protection, etc.
 - Internal road network, showing major/ minor roads (those existing or to be constructed);
 - Any natural forest (belt or otherwise) preserved for ecological purposes.
- NFA to verify their source of seed in order to have a crop of acceptable standard / quality.
- To clarify how resource users will be treated in allocated areas e.g. issuing licences in unplanted area or to be evicted. This should take into account possible negative impact/ repercussions by those affected.

CHAPTER 7: MITIGATION OF ENVIRONMENTAL AND SOCIAL IMPACTS

Mitigation measures tabulated below refer to impacts that result from implementation of this FMP. **Table 26** shows the key environmental impacts (positive and negative). It shows both environmental and social impacts of implementing this FMP.

Table 26: Key Environmental Impacts of Forest Management

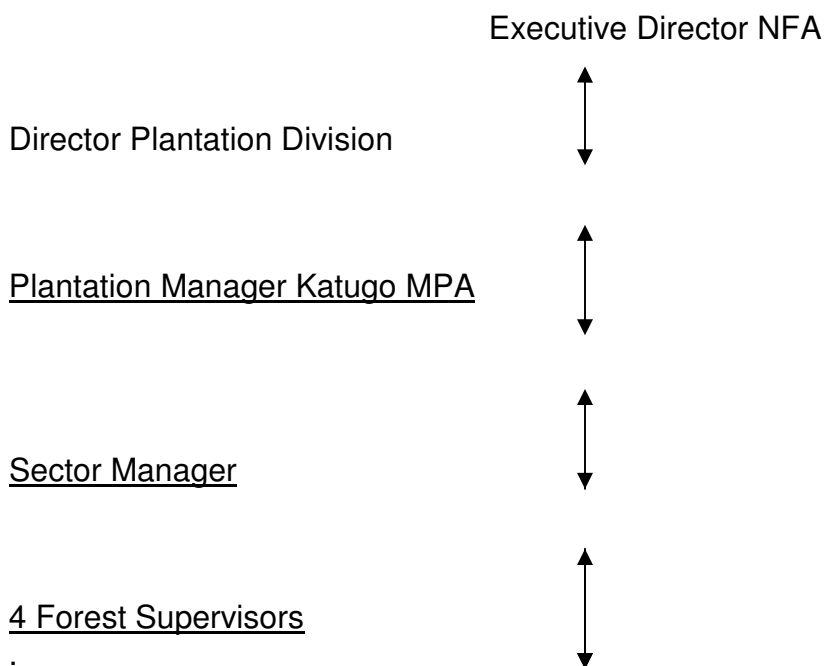
AUTHORISED ACTIVITY	POSITIVE IMPACTS	NEGATIVE IMPACTS	MITIGATION MEASURES
1. logging by clear felling		Loss of ground cover and loosening of soils	<ul style="list-style-type: none"> ○ Replanting of the harvested areas immediately after logging within a period of 1 year.
2. Opening of unclear boundary lines.	<ul style="list-style-type: none"> ○ Reduction of boundary conflicts between NFA and local community. ○ Enhanced status of the forest. 	None	Enhancement of the positive impacts
3. Contracting local community to provide casual labor.	<ul style="list-style-type: none"> ○ Enhanced income from the contracts and improved local livelihoods. 	None	Enhancement of the positive impacts.
4. Harvesting of forest products	<ul style="list-style-type: none"> ○ Improved livelihoods from forest products from subsistence and commercial needs. 	<ul style="list-style-type: none"> ○ Destruction of regeneration 	<ul style="list-style-type: none"> ○ Restriction of harvesting to plantation crop. ○ Permitting only low impact activities in the Conservation WC. ○ Harvesting licenses to be issued after verification of adequate raw material and under tight supervision
6. Charcoal and firewood production.	Improved livelihoods through incomes from the business.	Destruction of the forests through indiscriminate harvesting of the trees.	<ul style="list-style-type: none"> ○ Restriction of commercial charcoal production to Private Sector tree planting zone for purposes of land clearing and using the trees grown for firewood and charcoal production.
7. Road construction and maintenance	<ul style="list-style-type: none"> ○ Improved access to the reserves ○ 	<ul style="list-style-type: none"> ○ Excessive run off and soil erosion ○ soil compaction 	<ul style="list-style-type: none"> ○ .Construction of roads along contours to minimize excessive runoff and soil erosion ○ Use of light equipment and manual labour, during roads construction to avoid soil compaction
Establishment of forest plantations	<ul style="list-style-type: none"> ○ Improvement of forest cover 	<ul style="list-style-type: none"> ○ Removing of indigenous biodiversity 	<ul style="list-style-type: none"> ○ Leave natural belts of indigenous species

	<ul style="list-style-type: none"> ○ Increasing income to government and communities ○ Enhancement of the environment 	<ul style="list-style-type: none"> ○ Use of chemicals for spraying which may affects workers 	<p>within the plantations</p> <ul style="list-style-type: none"> ○ the swampy areas and wetlands will be left unplanted so that wetlands and swampy areas are not degraded ○ Training of workers in proper use and handling of chemicals. ○ Provision of protective wear.
Collaborative forest management	<ul style="list-style-type: none"> ○ Increased incomes to local communities ○ Increased value of the forest to local communities ○ Improved relations with collaborating communities 		<ul style="list-style-type: none"> ○ enhancement of the positive impacts
Protection of biodiversity	<ul style="list-style-type: none"> ○ Increased biodiversity ○ Possibility of increased tourism revenues & income to local communities 		<ul style="list-style-type: none"> ○ enhancement of the positive impacts
Restriction of harvesting	<ul style="list-style-type: none"> ○ Increased biodiversity ○ Forest health is maintained 	<ul style="list-style-type: none"> ○ Increased animosity between people and the managers 	<ul style="list-style-type: none"> ○ Public education ○ Support out-of forest substitutes ○ Affirmative actions towards the vulnerable sections of the people

CHAPTER 8: MANAGEMENT AND LOGISTICS

8.1 The Organisational Structure

The organisational arrangement of Kasagala-Katugo Forest Plantations and the linkage to the headquarters is as indicated in the chart below.



Staff

At present there is one Plantation Manager and 4 Forest Supervisors supported by 2 Transport Assistants charged with management of the MPA. The staff requirements are as indicated below.

Table 27: Current and required staffing levels

Staff category	Current staffing	Required staffing
Plantation Manager	1	1
Sector Manager	0	1
Forest Supervisors	4	4

One Sector Manager in charge of plantation establishment, plus tending operations shall recruited (Prescription 23).

Staff training and motivation.

In order to implement the prescriptions in the plan, a competent technical team is required. Relevant training for staff in various job oriented technical modules shall be conducted from time to time to improve on staff competence thereby contributing towards motivation. (Prescription 24)

Labour

Contractual workers will be engaged from time to time on various forest operations, depending on the requirements from within the local communities or from outsiders where local labour is not available. These will include among others ten patrol persons to assist the staff and also to be responsible for patrols and plantation work. Where the work is technical and the contractors require some skills, training will be conducted to provide the needed skills.

Payment for work done 'Wages/ contract sum' is a right to claimants and management shall treat it as a priority in expenditure *commitments*. Rates of payment shall be competitive and in accordance to standard guidelines issued by the government from time to time

Worker health and safety shall be provided in accordance with standards set by the ministry of labour and the contract terms. Health and Safety provisions will include among others use of protective gears such as helmets, field boots and clothes; and First Aid boxes etc.

Infrastructure

Buildings

The existing buildings will be maintained, however there is no proper store and timber shed. Currently, the uniports used as a store are old and leaking. It will therefore require construction of a permanent store and a timber shed for storage and seasoning of timber. (Prescription 25).

Routine maintenance of the existing buildings shall be undertaken regularly according to a maintenance schedule. The current nursery will also be expanded to cater for raising of seedlings for charcoal production in Kasagala. (Prescription 26).

Roads

The existing road network will be maintained on a yearly basis. However, it is not considered adequate to traverse the entire MPA because harvesting is taking place and replanting of harvested areas going on. It will therefore require opening up new access roads in the planted areas for easy access and also to serve as fire breaks. For both Katugo and Kasagala 30 Km on new roads will be constructed to access the planted areas. (Prescription 27)

Vehicles

The current fleet of vehicles will be maintained and routine maintenance carried out according to a maintenance schedule. The Tractor is old and an outdated model and therefore expensive to maintain. During the Plan period, a new tractor

will be procured and an additional pickup vehicle to facilitate the charcoal production programme. (Prescription 28)

Equipments and tools

There are basics tools that are required to carry out plantation work and road maintenance etc. Therefore, the followings items need to be procured every year. (Prescription 29)

Items	No.
Hoes	100
Pangas	40
Wheel barrows	10
Rakes	10
Pruning Saws	10
Axes	10
Two-man cross saws	10
Bow saws	10
Saw blades	40
Sharpening files	40

The following equipment and tools specific to fire protection that shall be available at the stations:

Items	No
Cellular phones or Walkie-talkies	05
Trailer with water tank of 1,000- 2000 litres capacity	02
20- litre water sprayer	50
15- litre water cans	30
10- litre watering buckets	30
Rakes	20
Fire beaters	100
Hoes	50
Spades/ shovels	30
Pangas	40
Two-man crosscut saws	10
Bow saws	20
Bow saws blades	40
20- Litre Jerry cans	40
Mugs	100
Siren	01
Maps	05

Equipments and Instruments

Basic equipment to carry out surveys and collect measurement data is necessary. Simple and cheap instruments are available on the markets. Other instruments can be made at the station, e.g. tree branch for height measurement and Relascope for Basal area. However, the following items will be purchased.

<i>Item</i>	<i>No</i>
Silver compasses	05
50- metre tapes	05
30- metre tapes	05
Diameter tapes	10
Sunto Clinometers	05
Callipers	04
Calculators	10
Pocket Weather Tracker (Kestrel 4000)	02
Relascope (Ludde)	05
Rain gauge	01

The following records will be kept for management planning and monitoring of the plan:

- Rainfall measurement records
- Silvicultural records
- Harvesting records
- Fire records
- Administrative records
- Establishment records
- PSP records.
- Compartment records.

CHAPTER 9: FINANCIAL FORECAST

9.1 Revenue

NFA is an autonomous body (Self accounting) and has to look for funds in order to sustain activities.

Round wood has been and will continue to be the main source of revenue. NFA does not use constant (gazetted) rates, but issues tenders inviting bids with a reserved (professional) price per cubic metre (m³). Currently, the reserved price for pines is Shs. 62,500/= per cubic metre (without VAT). It is anticipated that the value per m³ will subsequently rise to 75,000/=. These two values are used to calculate the anticipated revenue from the standing volume by year NFA decides to harvest. Table 22 gives the calculated revenue/value of standing volume. This reflects the possible loss in case of any damage/destruction. Details are in the appendixes.

Table 28: Summary of Calculated Revenue/ Value of Standing Volume at Katugo

Planting Year	CPT	Species	Age	Thinning year	Harvest year	Revenue commercial thinning	Revenue final harvest	Projected revenue total
1972/73	8	<i>P. caribaea</i>	35		2008/09	0	67,125,000	67,125,000
1973/74	9	<i>P. caribaea</i>	34		2008/09	0	0	0
1974	11	<i>P. caribaea</i>	34		2009/10	0	2,553,125,000	2,553,125,000
1975	13	<i>P. caribaea</i>	33		2009/10	0	509,625,000	509,625,000
1976	15	<i>p. caribaea</i>	32		2011	0	1,250,000,000	1,250,000,000
1991	15	<i>P. Caribaea</i>	17	2002	2012	15,000,000	262,500,000	277,500,000
1992	15	<i>P. Caribaea</i>	16	2003	2013	15,000,000	262,500,000	277,500,000
1993	15	<i>P. oocarpa</i>	15	2004	2014	7,500,000	131,250,000	138,750,000
1994	1	<i>P. oocarpa</i>	14	2005	2015	30,000,000	525,000,000	555,000,000
1998	1	<i>P. oocarpa</i>	10	2009	2019	9,000,000	157,500,000	166,500,000
1998	3	<i>P. Carribaea</i>	10	2009	2019	22,500,000	393,750,000	416,250,000
1998	4	<i>P. Caribaea</i>	10	2009	2019	16,500,000	288,750,000	305,250,000
1998	6	<i>P. Caribaea</i>	10	2009	2019	55,500,000	971,250,000	1,026,750,000
1998	7	<i>P. Caribaea</i>	10	2009	2019	60,000,000	1,050,000,000	1,110,000,000
1998	8	<i>P. Caribaea</i>	10	2009	2019	36,000,000	630,000,000	666,000,000
2001	1	<i>P. oocarpa</i>	7	2012	2022	10,500,000	183,750,000	194,250,000
2001	2	<i>P. oocarpa</i>	7	2012	2022	34,500,000	603,750,000	638,250,000
2003	6	<i>P. caribaea.</i>	5	2014	2024	21,000,000	367,500,000	388,500,000
2004	6	<i>P. caribaea</i>	4	2015	2025	12,000,000	210,000,000	222,000,000
2004	6	<i>P. oocarpa</i>	4	2015	2025	48,000,000	840,000,000	888,000,000
2004	7	<i>P. caribaea</i>	4	2015	2025	150,000,000	2,625,000,000	2,775,000,000
2004	8	<i>P. oocarpa</i>	4	2015	2025	45,000,000	787,500,000	832,500,000
2004	8	<i>P. caribaea</i>	4	2015	2025	130,500,000	2,283,750,000	2,414,250,000
2004	9	<i>P. caribaea</i>	4	2015	2025	16,500,000	288,750,000	305,250,000
2005	2	<i>P. oocarpa</i>	3	2016	2026	40,500,000	708,750,000	749,250,000

Planting Year	CPT	Species	Age	Thinning year	Harvest year	Revenue commercial thinning	Revenue final harvest	Projected revenue total
2005	2	<i>P. caribaea</i>	3	2016	2026	42,450,000	742,875,000	785,325,000
2005	3	<i>P. oocarpa</i>	3	2016	2026	9,000,000	157,500,000	166,500,000
2005	3	<i>P. caribaea</i>	3	2016	2026	43,500,000	761,250,000	804,750,000
2005	4	<i>P. caribaea</i>	3	2016	2026	133,500,000	2,336,250,000	2,469,750,000
2005	5	<i>P. oocarpa</i>	3	2016	2026	18,000,000	315,000,000	333,000,000
2005	5	<i>P. caribaea</i>	3	2016	2026	102,000,000	1,785,000,000	1,887,000,000
2005	6	<i>P. caribaea</i>	3	2016	2026	117,000,000	2,047,500,000	2,164,500,000
2005	8	<i>P. caribaea</i>	3	2016	2026	91,800,000	1,606,500,000	1,698,300,000
2006	5	<i>P. caribaea</i>	2	2017	2027	22,500,000	393,750,000	416,250,000
2007	15	<i>P. caribaea</i>	1	2018	2028	39,000,000	682,500,000	721,500,000
2007	8	<i>P. caribaea</i>	1	2018	2028	15,000,000	262,500,000	277,500,000
2007	7	<i>P. caribaea</i>	1	2018	2028	22,500,000	393,750,000	416,250,000
2008	1	<i>P. caribaea</i>	0.6	2019	2029	7,200,000	0	7,200,000
2008	15	<i>P. caribaea</i>	0.6	2019	2029	49,500,000	0	49,500,000
2008	12	<i>P. caribaea</i>	0.6	2019	2029	45,000,000	0	45,000,000
2008	9	<i>P. caribaea</i>	0.6	2019	2029	51,750,000	0	51,750,000
2008	10	<i>P. caribaea</i>	0.6	2019	2029	42,000,000	0	42,000,000
TOTAL						1,627,200,000	29,435,500,000	31,062,700,000

Table 29: Summary of Calculated Revenue/ Value of Standing Volume at Kasagala

Planting Year	CPT	Species	Age	Thinning year	Harvest year	Revenue commercial thinning	Revenue final harvest	Projected total revenue
2002		<i>P. caribaea</i>		2013		15,000,000	262,500,000	277,500,000
2003		<i>P. caribaea</i>		2014		22,200,000	388,500,000	410,700,000
2003		<i>P. oocarpa</i>		2014		3,000,000	52,500,000	55,500,000
2003		<i>P. oocarpa</i>		2014		8,100,000	141,750,000	149,850,000
2004		<i>P. caribaea</i>		2015		45,000,000	787,500,000	832,500,000
2004		<i>P. oocarpa</i>		2015		21,000,000	367,500,000	388,500,000
2005		<i>P. caribaea</i>		2016		11,100,000	194,250,000	205,350,000
2007		<i>P. caribaea</i>		2018		34,500,000	603,750,000	638,250,000
2008		<i>P. caribaea</i>		2019		33,000,000	0	33,000,000
TOTAL						192,900,000	2,798,250,000	2,991,150,000

Source: NFA Inventory Report conducted in November 2005 and Katugo office records.

Table 30: Estimated total revenue and sources for the 1st Five years of the FMP period

Source	Quantity	Rate	Amount
Sale of saw logs	120,000m ³	62500	7,500,000,000
2 nd thinning	5,720 m3	37,500	214,500,000
Private growers (ground rent)	500 ha	9,900	24,750,000
Sale of Fuel/firewood	1,800	8,000	14,400,000
slabs	300 lorries	200,000	60,000,000
Charcoal licenses	100	40,000	4,000,000
Seedlings	1,500,000	300	450,000,000
Total			8,267,650,000

Table 31: Estimated Annual Revenue for 1st Five years (2008/9 -2012/13)

Product/Item	2008/09	2009/10	2010/11	2011/2	2012/13	Total
Sale of saw logs	2,500,000,000	2,500,000,000	1,250,000,000	1,250,000,000	0	7,500,000,000
2 nd thinning	75,000,000	139,500,000	0	0	0	280,000,000
Private growers (ground rent)	4,950,000	4,950,000	4,950,000	4,950,000	4,950,000	24,750,000
Sale of Fuel/firewood	2,880,000	2,880,000	2,880,000	2,880,000	2,880,000	14,400,000
slabs	24,000,000	24,000,000	12,000,000	0	0	60,000,000
Charcoal licenses	800,000	800,000	800,000	800,000	800,000	4,000,000
Seedlings	90,000,000	90,000,000	90,000,000	90,000,000	90,000,000	450,000,000
Total	2,697,630,000	2,762,130,000	1,360,630,000	1,348,630,000	98,630,000	8,267,650,000

Table 32: Activity targets per year for the 1st five years

Expenditure item	2008/09	2009/10	2010/11	2011/2	2012/13	Total
Nursery operations (No. seedlings)	811,000	811,000	811,000	511,000	511,000	3,455,000
Nursery operations charcoal(No. seedlings)	800,000	800,000	0	0	0	1,600,000
Crop establishment (Ha)	400	400	400	150	150	1500
Crop maintenance (Ha)	1324	1724	2124	2124	2124	9420
Tending operations (Ha)	216					
Forest protection (Ha)	1748	1748	1748	1748	1748	8740
Fire Management (Km)	45	60	60	75	75	315
Road construction (Km)	0	30	0	0	0	30
Road maintenance (Km)	45	75	75	75	75	345

9.2 Expenditure

Table33: Expenditure estimates for 2008/9- 2012/13

Expenditure item	2008/09	2009/10	2010/11	2011/2	2012/13	Total
Nursery Establishment	121,650,000	121,650,000	121,650,000	76,650,000	76,650,000	518,250,000
Nursery Establishment (carbon)	240,000,000	240,000,000	0	0	0	480,000,000
Crop establishment	164,000,000	164,000,000	164,000,000	164,000,000	164,000,000	820,000,000
Crop establishment (carbon)	410,000,000	410,000,000	0	0	0	820,000,000
Crop maintenance	106,240,000	126,240,000	146,240,000	166,240,000	186,240,000	731,200,000
Tending operations	29,920,000	29,920,000	29,920,000	29,920,000	29,920,000	149,600,000
Forest protection	13,138,000	15,000,000	15,000,000	15,000,000	15,000,000	73,138,000
Fire Management	8,818,000	8,818,000	10,000,000	10,000,000	10,000,000	47,636,000
Road construction	0	60,000,000	0	0	0	60,000,000
Capital and Administrative costs	123,740,000	143,740,000	143,740,000	143,740,000	143,740,000	698,700,000
Road maintenance	6,300,000	6,300,000	10,500,000	10,500,000	10,500,000	44,100,000
Boundary maintenance	7,860,000	7,860,000	7,860,000	7,860,000	7,860,000	39,300,000
Grand Total MPA	1,231,666,000	1,333,528,000	648,910,000	623,910,000	643,910,000	4,481,924,000

Table 2: Katugo Management Plan summary costs for 2008/9

Expenditure item	Total	Percentage
Nursery Establishment	518,250,000	11.56%
Nursery Establishment (carbon)	480,000,000	10.71%
Crop establishment	820,000,000	18.29%
Crop establishment (carbon)	820,000,000	18.29%
Crop maintenance	731,200,000	16.31%
Tending operations	149,600,000	3.33%
Forest protection	73,138,000	1.63%
Fire Management	47,636,000	1.06%
Road construction	60,000,000	1.33%
Capital and Administrative costs	698,700,000	15.58%
Road maintenance	44,100,000	0.98%
Boundary maintenance	39,300,000	0.87%
Grand Total MPA	4,481,924,000	100%

CHAPTER 10: MONITORING AND EVALUATION (M&E)

Monitoring and evaluation (M&E) is necessary to assess the performance against objectives/ targets, both in terms of quality and quantity. Where failures are observed, appropriate action has to be taken in order to rectify the situation and achieve targets. Implementation of the Management plan will be monitored through a more detailed monitoring plan will be prepared from the broad framework shown below. This monitoring plan will be prepared during the first **six** months of management plan. The main ways of monitoring will include:

Forest level

This will involve the field staff with the frequency of monitoring of the forest supervisors most frequent. Depending on the activities, this will range from weekly to monthly to the sector manager and quarterly by the plantation manager

HQ

Headquarter staff, including members of the Senior Management Team, will visit the field regularly to inspect activities at forest level.

Monitoring Team

NFA will constitute a monitoring team composed of the M&E Specialist, the Internal Auditor and the relevant subject matter Coordinator/Specialist. Assessment of management plan performance will then be done once a year, just before starting work on preparing a new AOP. Experiences and lessons learnt will feed into the new AOP. The Team will undertake a mid-term evaluation at the end of year 2 of the management plan performance so that it can be reviewed to take into account emerging issues, lessons learnt and experiences gained.

NFA Board of Directors

One of the roles of the Board is to monitor performance of the NFA. Once a year, the Board will formally assess performance based on the monitoring plan.

Performance Agreement Monitoring Committee

NFA has signed a performance agreement with GoU. Performance under this contract is monitored through a Committee set up by GoU. This Committee carries out a formal monitoring exercise once every six months. This arrangement will continue unless the provisions of the performance contract change.

Table 35: Monitoring Framework for the Management Plan

	Objectives	Baseline	Objectively Verifiable Indicators	Means & Sources of Verification	Frequency of Monitoring	Responsible for Monitoring
1	To develop and manage Katugo as a model profitable enterprise whereby the production chain from nursery through plantation management, wood processing to the seasoning of milled timber will be followed.	1213 ha of young plantation by NFA and 424 ha by private sector	400 ha replanted annually by NFA and 300 ha by the private sector developed by EOY 3.	NFA annual reports; physical inspections	Monthly Quarterly annually	<ul style="list-style-type: none"> • Forest supervisors • Sector manager • Plantation manager • NFA Monitoring Team (M&E Specialist, Internal Auditor, the relevant Coordinator)
		wood processing without seasoning of milled timber	All milled timber seasoned at the station by EOY 5	NFA annual reports; physical inspections	Monthly Quarterly annually	<ul style="list-style-type: none"> • Forest supervisors • Sector manager • Plantation manager • Sawmill manager • NFA Monitoring Team
		No timber seasoning yard available	timber seasoning yard established by EOY 2	NFA annual reports; physical inspections	annually	NFA Monitoring Team
2	To produce sawlogs by planting fast growing tree species which mature within a period of 20 – 25 years.	All the mature sawlogs are beyond the rotation period of 20-25 years	By EOY 5 2000 ha of planted crop will be under proper management and maintenance	NFA annual reports; physical inspections	Monthly Quarterly Annually	<ul style="list-style-type: none"> • Forest supervisors • Sector manager • Plantation manager • NFA Monitoring Team

	Objectives	Baseline	Objectively Verifiable Indicators	Means & Sources of Verification	Frequency of Monitoring	Responsible for Monitoring
3	To provide for sustainable charcoal production using modern kilns of higher conversion efficiency, in partnership with the local communities and private sector under the Clean Development Mechanism	Charcoal production is illegal and unsustainable	By EOY 5, 2000Ha in the production zone of Kasagala planted with indigenous charcoal producing species and communities around Kasagala mobilized and licensed to produce charcoal using improved kilns	NFA annual reports; physical inspections, interviews	Monthly Quarterly Annually	<ul style="list-style-type: none"> • Forest supervisors • Sector manager • Plantation manager NFA Monitoring Team Private sector
4	Conservation of the indigenous vegetation type which does not occur elsewhere in the country even in the protected areas, the National Parks and protect biodiversity associated with such unique vegetation as found in Kasagala forest reserve.	Biodiversity zones demarcated in Kasagala	By EOY 5, Kasagala will be managed in accordance with the conservation objectives contained in the FNCMP	NFA annual reports; physical inspections	Monthly Quarterly Annually	<ul style="list-style-type: none"> • Forest supervisors • Sector manager • Plantation manager NFA Monitoring Team Performance Contract Review Team

APPENDIX 1:**REFERENCES**

- Anon Departmental standing orders, forest department, 1997
- Anon Silvicultural Plantation Management Handbook. Forest Resources Management and Conservation Programme, Forestry Department.
- Anon Nakasongola District Forestry Development Plans. Period of Plan 2003-2014
- Anon Guidelines for implementing Collaborative Forest Management in Uganda, Ministry of Water, Lands and Environment, December 2003.
- Anon The Uganda Forestry Policy, 2001, Ministry of Water Lands and Environment.
- Anon The National Forest and tree planting Act 2003
- Forestry Department Uganda Forest Nature Conservation Master Plan 2002
- Kiwanuka Bonny Management Plan for Katugo Plantation. For period 2001-2024 et el 2002
- M.E Sizomu-Kagolo Et al 2003 Forest Management Plan for Kalinzu Forest Reserve for period 1st Jan 2003 –31st Dec 2013.
- P.K Karani, Matching Tree Species to sites at Kasagala Forest Reserve, Nakasongola Nov.2002 District (Final Draft).
- P.K Karani, Matching Tree Species to Sites at Katugo Forest Reserve Nakasongola district May 2004 (final report)
- P.K. Karani Management Plan for Kasana- Kasambya Central Forest Reserve, Mubende
- Paul Drichi & D Elungat. Rapid Forest Plantation Assessment and Harvesting Plan update, January 2004.
- Tugimisirize Obed, Report on Management Planning Exercise in Conifer Plantations (March 2000- Apr - Dec 2001) Forest Department
- David Elungat NFA Inventory Report for Soft wood Plantation, November 2005

Appendix 2: Summary of Prescriptions

There will be three management circles: **Prescription 1:**

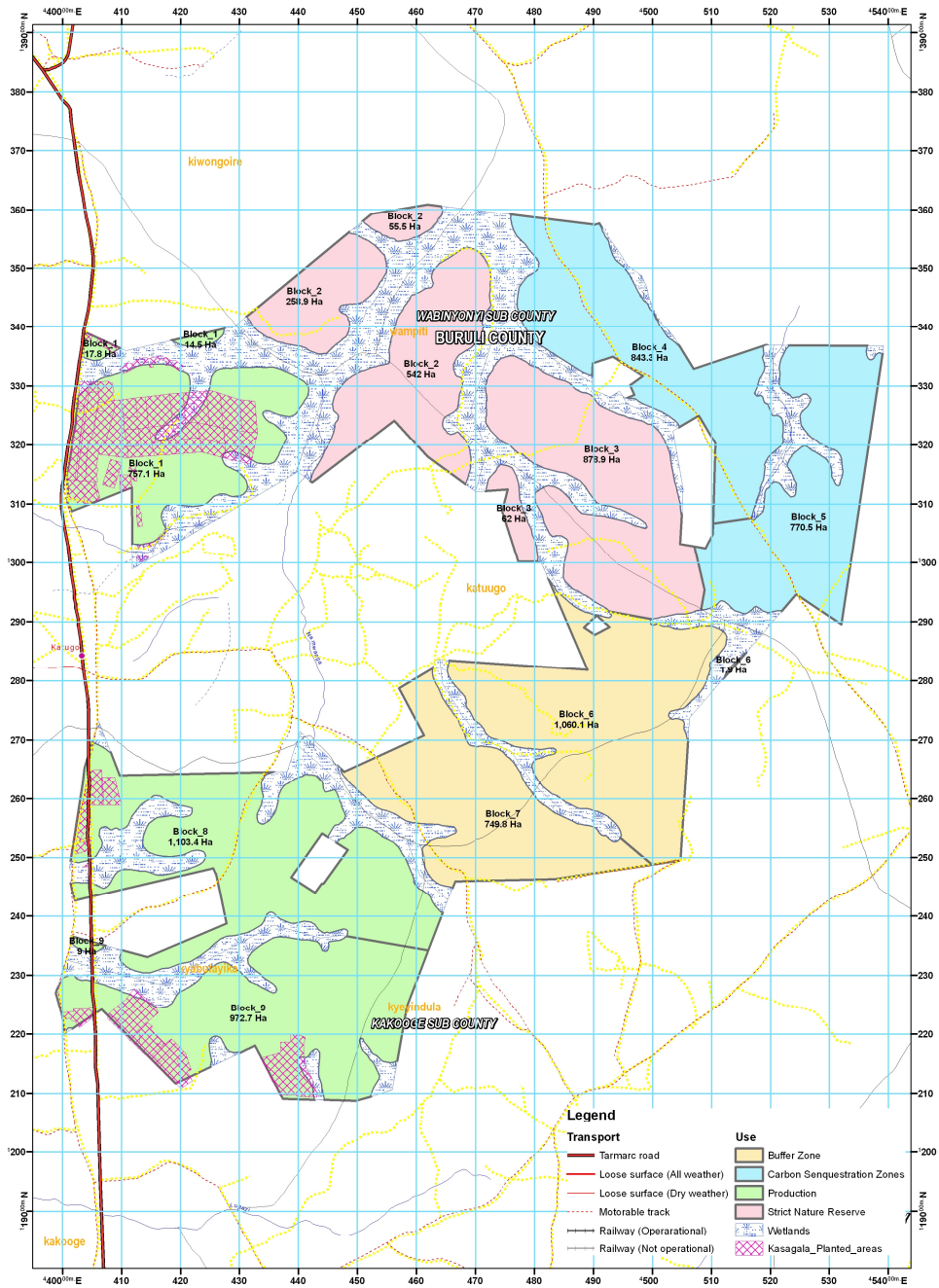
- A. The sawlog production circle to be managed by NFA covering about 8000 hectares in Katugo and Kasagala, private tree planters and the community.
- B. Sustainable charcoal production circle to be managed by NFA in partnership with the local community and private sector in Kasagala covering 2000 ha.
- C. The conservation of indigenous vegetation and biodiversity in Kasagala F.R nature reserve and ecologically sensitive areas management circle. This will take up 3100 ha of the northern part of Kasagala reserve. The area includes the Strict Nature Reserve 2100 ha and the buffer zone 1000ha.
 - This plan for Katugo and Kasagala reserves will remain valid for a period of twenty (20) years from 1/7/2008 to 30/6/2028. It shall be reviewed every five (5) years in a participatory manner with communities and key stakeholders to cope up with forest management and related needs. **(Prescription 2).**
 - The long-term aim to produce a sustainable yield of round wood by attaining and maintaining forests that are approximately normal in terms of areas of different age gradation in order to obtain regular supplies of timber for wider market and local communities use. To attain this, the annual volume to be cut shall be regulated and approximately equal to the annual increment. **(Prescription3).**
 - Clear felling will be concentrate in areas, which reached the rotation age. Clear felling will be done by NFA and individual customers after buying wood of standing volume. **(Prescription 4).**
 - Thinning will be carried out twice in order to remove poorly formed trees, so that the stands produce only large, high quality trees which can be sold at a premium price. **(Prescription 5).**
 - Trained contractors under close supervision of the Forest Supervisor in-charge will carry out thinning in the plantation. Cross cut saw, axes, bow saw and power saws will be used in carrying out thinning. **(Prescription 6).**
 - Seedling production will be done at Katugo Nursery. **(Prescription 7).**
 - Local seeds will be procured from NFA National Tree Seed Centre, Namanve or imported seeds to be used in seedling production. **(prescription 8)**
 - In the new planting areas, a compartment shall be 25 –30 Ha. **(Prescription 9).**

- Lining out and pitting shall maintain a straight line in all directions.(**Prescription 10**).
- Glyphosate herbicide will be applied at 4-5 litre/ha in pre planting spraying. (**Prescription 11**).
- Where manual / hand weeding is to be done slashing and spot hoeing shall be done in the first year, then spot hoeing and line slashing in the second and third year. (**Prescription 12**).
- Pruning will be carried out to facilitate easy access through the plantation and to produce knot free timber of the final crop (**Prescription 13**).
- Sector Manager Katugo shall periodically organise and conduct seminars to inform communities on risks and effects of fires.(**prescription 14**)
- A fire boss will be appointed on weekly basis, who will be in charge of monitoring any fire out break. (**Prescription 15**).
- All surrounding boundaries and fire lines within the plantation shall be slashed/ cleared of grass/ shrubs; and herbs. (**Prescription 16**)
- Fire Danger Index System will be used to guide levels of preparedness.(prescription 17).
- A fire fighting crew shall be on the stand by with tools/ equipment,on 24-hour alertness (**Prescription 18**).
- NFA Headquarters shall construct fire tower (at least 35- 40 m high) initially for Katugo and part of Kasagala at a high point from where much of the plantations can be viewed/ controlled. (**Prescription 19**)
- A road network shall be developed to facilitate communication in the forest (**Prescription 20**).
- Sustainable charcoal production will carried in Kasagala forest reserve covering an area of approximately 2000 ha. It will involve the planting of suitable broadleaved, short rotation tree species for purposes of charcoal production.(**Prescription 21**).
- Resurvey and demarcate all FR boundaries as already expressed by the lands and survey department. All boundaries have to be geo-referenced for future tracing / location of FR'S (**Prescription 22**).
- One Sector Manager in charge of plantation establishment, plus tending operations shall recruited (**Prescription 23**).

- Relevant training for staff in various job oriented technical modules shall be conducted from time to time to improve on staff competence thereby contributing towards motivation. **(Prescription 24).**
- The existing buildings will be maintained, however there is no proper store and timber shed. Currently, the uniports used as a store are old and leaking. It will therefore require construction of a permanent store and a timber shed for storage and seasoning of timber. **(Prescription 25).**
- The current nursery will also be expanded to cater for raising of seedlings for charcoal production in Kasagala. **(Prescription 26).**
- For both Katugo and Kasagala 30 Km on new roads will be constructed to access the planted areas. **(Prescription 27).**
- During the Plan period, a new tractor will be procured and an additional pickup vehicle to facilitate the charcoal production programme. **(Prescription 28).**
- There are basic tools and equipment that are required to carry out plantation work and road maintenance etc. Therefore, the following items need to be procured every year. **(Prescription 29).**

APPENDIX 3: MAPS OF KATUGO CFR

APPENDIX 4: MAPS OF KASAGALA CFR ZONATION



Appendix 5: Planning Process

The planning process for drafting this Forest Management Plan (FMP) was as follows:

Formation of planning team:

Planning team consisted of the following members:

1	Kagolo M.Sizomu Kagolo	FMP Consultant
2	Okurut Stephen	Plantation Manager- Central Plantation
3	Mbazzira Josephat	DFO- Nakasongola District
4	Wamugera Swalli	Former Assistant Forestry Officer- Katugo
5	Oyiro Dennis Julius	Sector Manager- Nakasongola Sector
6	Eunice Basemera	Forest Supervisor- Katugo
7	Ajok Florence	Forest Supervisor- Kasagala
8	Kamwada Willy	Forest Supervisor- Katugo Nursery
9	Edrisa Sserunga	Former Forestry Guard- Katugo

Process Initiation and programme

This started way back on September 15th 2004 at Katugo Forest Station involving all members of the planning team. The views of the stakeholders were collected and analysed.

Data Collection:

Data were collected through field consultations with communities adjacent to the Forest Reserves as per the programme and it yielded a lot of information concerning history of these reserves.

Review of various literatures provided for Inventory Report by David Odeke Elungat on the status of the Forest Reserves.

Organisation the Consultations Workshop

The workshop was intended to examine the views/ issues raised by adjacent communities so that they are discussed and incorporated in the FMP.

Review of the final draft was undertaken in October 2008 by Katugo Plantation staff led by the Plantation Manager, Mr. Joseph Sentongo and the forest supervisors mentioned above in addition to Mr. Tangzekpe Genesisious Iba

Appendix 6 : Area statement for Katugo FR: by compartments and species

Zone	Area (ha)	Description
1. Plantation Zone		Production area is demarcated into Compartments.
Planted timber species	<ul style="list-style-type: none"> - 1084.8.3 ha to <i>P. caribaea</i> - 156.3 ha planted to <i>P. oocarpa</i> - 52.3 ha planted to other Pines - 5.9 ha other species - 719.8 ha Species as above 	Well-stocked area of various areas, of various planted species. Planted but poorly or non-stocked area.
Firelines	- 83.7 ha	Strips clear of vegetation to protect plantation from fires.
Roads	39 ha	
Unplanted areas within the plantation zone	437.3 ha	Swampy area gazetted to maintain a supply of water for the Forest Reserve.
2. Residential areas	19.9 ha	Forest Station, Settlements, Picnic sites, Schools etc.
<i>Total Plantable Area</i>	<i>2811.5</i>	
3. Swampy Area outside plantation area	506.5 ha of swamp	River Lugogo
<i>Total Area of Forest Reserve</i>	<i>3,318 ha</i>	

Appendix 7: Katugo Historical trends

Date	Event	Significance to Forest management
1963	Gazetement of 2,546 ha	Demarcating for specific forestry objectives
1964	First trial planting of confers <i>Maesopsis eminii</i> and <i>Terminalia ivorensis</i>	Increase wood supply through research of indigenous and exotic spp.
1966- 1976	Extensive planting of <i>Pinus caribaea</i> , <i>P. oocarpa</i> , <i>P. kesiya</i> , <i>P. insularis</i> and <i>P.markussii</i>	Establishment of important area of commercial scale plantations.
Early 1970's	Swamps are added to existing Reserves area to provide water for plantations	Enhancing plantations management with adequate supply.
1989	FD carried out inventory of Katugo plantations planted: 1297.3 HA TO P. CARIBAEA - 156.3 ha planted <i>P. oocarpa</i> - 52.3 ha planted with other species - 5.9 ha other species 719.8 ha Mixed species	Determining the available resources for proper planning and management purposes.
1992	Logging operation started in mature stands. Some replanting done, but was not of good quality and was not tended.	Industrial use of mature crop.
2000	Preparation of Management Plan for Katugo Forest Reserve by FD staff	Improving management and Resource use control
2004	NFA took over the control of Katugo Central Forest Reserve for former FD	Improving effective management of the CFRs
2004	Massive replanting by NFA.	Most of the clear felled areas were planted.

Appendix 8: Historical trends of Kasagala CFR.

Year	Event/ Activity	Significant to Forestry
1963	1 st gazettement as Local Forest Reserves	Introducing FD management on demarcated area (Forest Reserve).
1967- 1968	<ul style="list-style-type: none"> - Regazettment as CFR. - There was a serious famine in the area as a result of the Buganda Kingdom crisis of 1966. Charcoal burning started in areas along the road as income generating activity. 	<p>Enhancing management. Forest harvesting by charcoal burners started.</p> <p>Severe unplanned reduction of forest resources.</p>
1968	<ul style="list-style-type: none"> - Construction of Kampala-Gulu Highways started. - Charcoal burning increased due to markets provided by road workers. 	More Forest resource harvested for charcoal.
1981- 1986	Many people abandoned homes due to insecurity	Reduction of forest use.
1986	<ul style="list-style-type: none"> - Museveni came to power. - People came back to their villages. <p>Charcoal burning increased as it was the only quick means of livelihood</p>	Most forest resource harvested.
1988- 1990	Banyarwanda and Banyankole also came back with their animals.	Settling and grazing in FR in big numbers.
1993- 1994	Biological inventory on Forest Reserve	Proposed for zonation into: <ul style="list-style-type: none"> - Strict Nature Reserve - Buffer Zone - Production Zone
1993- 1995	<ul style="list-style-type: none"> - Boundary resurvey, reopen and planted with live markers 74 kms of external boundary. - Protection patrols were also intensified. 	Boundaries of the FR were made known. Some encroachers in Kalungu left. Charcoal burning was also reduced.
1996	The EC fund to the forest stopped. Patrolmen were laid off.	<ul style="list-style-type: none"> - Charcoal burning again increased. - Cattle grazers also continued settling on FR.
1998- 2000	<ul style="list-style-type: none"> - Enactment of the Land Act - Many Private Land Owners started fencing off their lands evicting people. 	<ul style="list-style-type: none"> - Many evicted people especially cattle grazers invaded the FR land. - Increased encroachment.
1998- 1999	Protection supported by EC Forestry Programme	Proposed Strict Nature Reserve got some protection. But when lifted, encroachers returned.
2000	Eviction notices given to all encroachers by the District Forest department.	More protection of the FR to ensure FD control.
2002	Strategic Forest Management Planning for Nakasongola DFD started.	Enhancing systematic forest management.
2002- 2004	EU funded FRCMP project established a 80 ha Demo plot of Pines.	More interest developed in Tree planting by private farmers.

Appendix 9: Monitoring Sustainable Forest Management: Extracts of Criteria and Indicators from ITTO guidelines.

Criteria for sustainability	Indicators of sustainability
Resource security	Clear boundary demarcation
	Presence/absence of illegal exploitation and encroachment.
	Duration of partnership agreements
The conservation of flora and fauna	Protection of the ecosystems in the management unit
	The extent of vegetation disturbance after human activity.
An acceptable level of environmental impact	Extent of soil disturbance/erosion, especially through human activity.
	Extent and spatial distribution of riparian and other watershed protection areas.
	Provision of or protection of rivers, streams and wetlands.
Socio-economic benefits	The number of people employed (self-employed or other wise)
	The nature and extents of benefits from activities based on the MP.
Planning and adjustment to experience	Community conservation
	Arrangements to take into account traditional forest utilization.

Extracted from: International Tropical Timber Organisation (ITTO) Policy Development Series No. 3, 1992.

Appendix 10: Rainfall Record Statistics in millimetres (mm)- Katugo Forest Station June 03- April 06

Day	Jun-03	Jul-03	Aug-03	Sep-03	Oct-03	Nov-03	Dec-03	Jan-04	Feb-04	Mar-04	Apr-04	May-04	Day	Jun-04	Jul-04	Aug-04	Sep-04	Oct-04	Nov-04	Dec-04	Jan-05	Feb-05	Mar-05	Apr-05	May-05	Day	Jun-05	Jul-05	
1	0		0	0	0	6	7	0	0	9		0	1	0	0	0	0	0	0	0	0	0	78	0	0	1	0	0	
2	0		0	0	21.5	0	0	0	0	0		0	2	0	0	0	0	16	0	7	0	0	0	0	47	2	0	0	
3	0		0	23	0	8	0	0	0	0		5	3	1	0	0	0	19	0	0	0	0	0	0	0	3	0	0	
4	0		0	0	2	34	0	11	0	0		0	4	0	0	5	0	0	0	0	0	0	5	0	6	4	0	0	
5	0		0	7	0	0	0	3	0	14		0	5	0	0	0	0	0	0	0	0	0	6	20	0	5	0	0	
6	0		0	0	0	0	0	0	0	0		0	6	0	0	0	43	0	22	0	0	0	8	5.5	0	6	4	0	
7	0		0	0	7.2	0	0	0	0	19		0	7	0	0	0	0	0	17	0	0	0	0	0	0	7	0	0	
8	0		13	0	0	0	0	0	0	3		10	8	0	0	0	8	0	0	0	0	0	0	0	0	8	7	0	
9	0		0	40	0	0	0	0	0	0		0	9	0	0	0	6	0	0	0	0	0	0	2.5	0	9	0	0	
10	0		0	9	1.5	15	43	0	0	0		0	10	0	0	0	0	0	0	0	0	0	0	0	0	10	0	0	
11	35		0	10	0	26	5	0	0	0		0	11	0	0	0	3	0	0	0	0	0	0	0	7	11	0	13	
12	0		0	0	0	25	0	0	0	0		0	12	11	0	7	0	11.5	0	0	0	0	0	10	0	12	0	0	
13	0		0	0	0	0	0	0	0	0		0	13	2	0	12	0	0	0	0	0	0	0	13	16	13	0	0	
14	0		12	0	8	8	0	0	0	0		0	14	0	0	9	0	8	0	0	0	0	0	8.5	0	14	0	0	
15	0		5	0	0	6	0	0	0	0		0	15	0	0	0	8	0	15	0	0	0	0	2	9	15	0	0	
16	0		0	0	0	4	0	0	0	0		1	16	0	0	2.5	0	0	0	0	0	0	0	7	0	0	16	2	0
17	0		4	12	0	0	0	0	0	0		0	17	0	0	0	0	26	0	0	0	0	0	0	3.5	0	17	0	0
18	0		0	2	21.3	24	0	0	1	0		0	18	0	0	24	0	0	0	0.05	0	0	3.5	14.5	12	18	4	0	
19	0		0	0	17.4	0	0	13	10	0		0	19	5	0	15	0	11.5	5	0	0	0	0	0	0	19	0	0	
20	0		0	0	21.4	0	16	0	2	0		0	20	0	0	0	3	7	17.5	0	0	0	10	0	0	20	0	0	
21	18		0	0	16.4	0	16	0	0	0		0	21	0	0.1	0	0	7	0	0	0	0	15	0	0	21	12	0	
22	0		0	0	0	0	0	0	0	0		0	22	0	0	0	0	11	0	0	0	0	0	0	0	22	0	0	
23	0		0	0	0	0	0	50	0	0		0	23	0	0.1	0	36	0	0	0	0	0	0	0	15	23	33.5	4.5	
24	0		19	0	17.6	0	0	44	0	0		0	24	0	0.1	11	0	0	37	0	0	0	0	0	0	24	0	0	
25	0		0	0	7.3	9	0	0	0	0		0	25	0	0.3	3.5	27.5	0	22.2	0	0	0	0	0	0	25	0	0	
26	0		0	0	0	0	0	0	16	45		0	26	0	0	15	0	0	2	0	0	0	11	0	0	26	0	0	
27	0		0	0	0	0	0	0	0	0		0	27	0	3.93	0	0	15	0	0	0	0	0	14	0	27	0	0	
28	0		0	0	0	0	0	0	0	0		0	28	0	0	0	0	53	0	0	0	0	2.5	18	0	28	0	0	
29	0		38		0	1.5	0	0	3	0		0	29	0	0	0	0	5	0	0	25	0	56	0	4	29	0	0	
30	3.5		0	1.9	22	0	0	0	0	0		0	30	0	0	0	46.5	10	0	0	5	0	0	0	28	30	0	0	
31	0		0	0	0	0	0	0	0	0		0	31	0	0	0	0	19	0	0	0	0	0	0	0	31	0	0	
Total	56.5	0	91	104.9	163.6	166.5	87	121	32	90		16	Total	19	4.53	104	181	219	137.7	7.05	0	202	111.5		Total	144	62.5	17.5	

Planning Matrix for Plantation Development and Savannah Woodland Management

Problem/ Issues	Causes	Vision	Management Objective	Strategies	Activities
Management	- Lack of Skills (private partners/ NFA)	A well established plantation(s) in providing both direct and indirect benefits to the community and the nations	- To equip staff and partners with skills	- Training of staff and partners and contractors	- Mobilisation of staff and contractors - Identify institutions or service providers - Carry out a needs assessment - Organise training workshops and seminars
	- Inadequate funding/resources		- Adequate funding and resources	- Acquiring long term loans and grants	- Writing of proposals and advocating
				- Collaborative efforts	- Formation of cooperative/ CBOs - Making partners agreements - Mobilisation of community
- Inadequate staff	- To contract service providers	- Identify and register competent people	- Training and mobilisation - Awarding contracts		
Management activities	- Limited accessible land outside CFRs		- Ensure effective utilisation of land outside CFRs	- Promote modern farming technologies	- Sensitisation - Demonstrations
				- Promote non consumptive use of CFRs, e.g. bee farming	- Sensitisation - Demonstrations - Issue use permits/ agreements
				- Legalise existing settlement	- Establish number and areas (ha)(covered - Identify alternative land for exchange with NFA - Degazetting the area occupied

Forest Category	Problem/ Threat/ Issues	Causes	Vision	Management Objective	Strategies	Activities
		- Inadequate control		- Ensure strict management and control	- Promote collaborative management with local communities	- Identify communities/ stakeholders - Organise community meetings - Establish/ create CBOs - Use CFM agreements
	Termites	- Imbalance in ecosystem, climatic changes		- Control damage of trees by termites for ensuring survival of plantation growth	- Research studies	- Publish the termite problem - Conduct research - Use available chemical
					- Plant termite resistant species	- Identify and promote tree planting - Disseminate information on resistant species
	Poor public relations	- Inadequate PR by staff - Negative attitudes towards CFRs by the local people - Lack of direct benefits by the community - Limited information on importance of forest conservation	As above	- A plantation for timber and other products where NFA management and community understand the value	- Impart PR skills	-
					- Strengthening the community	- Training - Radio programme - Open days - Implementing CFM guidelines
					- Address some needs for the community	- Identify and integrate the community concerns in the management plans - Initiate projects for community benefit/ use
Savannah woodland	<ul style="list-style-type: none"> ▪ Indiscriminate cutting of trees ▪ Charcoal burning 	<ul style="list-style-type: none"> - Poverty - Ignorance - Unemployment - Farming, Firewood, grazing fields 	A well managed sustainably and productive woodland by 2015	- Sustainable forest production for social and economic development by	- Sensitising the community	<ul style="list-style-type: none"> - Use media through talk shows and newspaper - Conduct meetings - Conduct workshops

Forest Category	Problem/ Threat/ Issues	Causes	Vision	Management Objective	Strategies	Activities
		<ul style="list-style-type: none"> - Lack of ownership - Building construction - Settlement 		2015	<ul style="list-style-type: none"> - Planting of trees 	<ul style="list-style-type: none"> - Provision of seeds and seedlings - Technical training to communities on how to raise trees - Provision of planting materials at subsidised prices
					<ul style="list-style-type: none"> - Staff motivation 	<ul style="list-style-type: none"> - Provision of transport - Provision of good salary
					<ul style="list-style-type: none"> - Collaborative forest management 	<ul style="list-style-type: none"> - Agreement with communities - Developing/ use guidelines under CFM
	<ul style="list-style-type: none"> ▪ Eviction of settlers and encroachers 	<ul style="list-style-type: none"> - Lack of land - Political instability - Fertile land 		-	<ul style="list-style-type: none"> - Resettlement of encroachers and settlers in FRs. 	<ul style="list-style-type: none"> - Use land fund - Identification of accessible alternative land for settlers to relocate
Forest Category	Problem/ Threat/ Issues	Causes	Vision	Management Objective	Strategies	Activities
	Eviction of settlers and encroachers (Continues)	<ul style="list-style-type: none"> - Overpopulation - Lack of jobs - Ignorance - Laziness 		-	<ul style="list-style-type: none"> - Amendment of existing Forest Act to benefit the settlers or (illegal settlement) 	<ul style="list-style-type: none"> - Lobbying parliament - Nakasongola DLG to intervene in acquiring land
		<ul style="list-style-type: none"> - Unemployment - Non observance of Forest Act/ Laws - Ease income earnings resource 		<ul style="list-style-type: none"> - Promotion of Environmental protection and nature Conservation 	<ul style="list-style-type: none"> - Conservation of wetlands 	<ul style="list-style-type: none"> - Sensitisation - Enact bye-laws and ordinances - Developing action plan for community
	Illegal animal grazing	-	▪	-	<ul style="list-style-type: none"> - Soil and Water conservation 	<ul style="list-style-type: none"> - Planting trees - Appropriate farming methods, e.g. mulching, agroforestry, contour ploughing etc
		-	▪	-	<ul style="list-style-type: none"> - Biodiversity conservation 	<ul style="list-style-type: none"> - Sensitisation and education - Demarcation of strict nature reserves (zoning)

Forest Category	Problem/ Threat/ Issues	Causes	Vision	Management Objective	Strategies	Activities
	Poverty	<ul style="list-style-type: none"> - Over population - Lack of jobs - Ignorance - Laziness 		<ul style="list-style-type: none"> - Participatory management and improved community living 	<ul style="list-style-type: none"> - Participatory management - Improved community living 	<ul style="list-style-type: none"> - Use CFM guidelines - Form management LC committees - Secure licenses for trading in forest produce - Seminars on income-generating activities

Appendix 12: Matching tree species to soil sites in Katugo CFR

	Soil Site (Zone)	Soil Characteristics	Area (Ha.)	Remarks
A	Hill top	Laterite (ironstone) and quartzite rocks exposed to the surface. Top layer soil generally thin. Cpts. 4,5,8,9 and 10.	73.6	<i>Pinus caribaea</i> for replanting compartments
B	Watershed between Lugogo and Namwanga	Iron sheet rock below the soil surface, small parts exposed by erosion and road works in cpts. 15, 5, and 1 North to south. Laterite boulders on soil surface.	685.8	Most suitable <i>P. caribaea</i>
C	Top and flanks of hills-typical of Buruli catena	Serious sheet erosion and annual fires, which the pine needles cover, layer exposing topsoil, this trampled by cattle loosening and subjecting it to downhill water erosion. Cover parts of cpt, whole of 3 and 6 to 14.	1787	<i>P. caribaea</i> var. <i>hondurensis</i> and <i>P. kesiya</i> most suitable, <i>P. oocarpa</i> demands timely weeding, pruning and thinning to minimize fire effects.
D	Narrow band of intersection of gentle slope of B and steep slope.	A narrow band 100m wide or less. Soil with quartz stones exposed to surface. Quartz associated with laterite boulders appearing as small anthills through the zone of thin soil.	163.4	<i>P. caribaea</i> survives best.
E	Valley bottom and flood plain areas – on either side of streams.	Sandy and free draining deep and fertile soil, washed down from C&D Zones. Clay swamps, cause of impeded drainage.	608.2	<i>P. oocarpa</i> grows better in valley bottom sandy soils and most suitable
	TOTAL		3318	

Appendix 13: Matching tree species to soil sites in Kasagala CFR

	Soil Site (Zone)	Soil Characteristics	Area (Ha.)	Remarks
A	Hill top	Sites of forest and woodland gradually merging on flanks of hills .Soil lost fertility through overgrazing, erosion and trampling by cattle humus lost.	3659	Suitable species <i>P.caribaea</i> , <i>P. kesiya</i> and <i>P. oocarpa</i>
B	Narrow band a bout 20 m round hills	Similar to Zone A above and zone C below showing occurrence of solid laterite rock outcrops and shallow stony soils with laterite and quartzite pebbles in them. Low moisture content due to grazing.	92	Most suitable <i>P. caribaea</i>
C	Hill flanks where land rises gently about 5 %	Lower part has some best sites in the FR especially next and above Zone B. Well-drained loam soils where charcoal burning and intensive grazing not observed yet.	1682	Suitable species <i>Araucaria cunninghamii</i> , <i>Cedrela odorata</i> and <i>Maesopsis eminii</i> on sites still with trees.
D	On either side of swamps with grass	Soils sandy, sandy clay to clay, freely drains with signs of water logging near swamps. Most trees cut down were replaced by grass, grazed during the dry seasons.	808	Planting <i>Araucaria cunninghamii</i> <i>Maesopsis eminii</i> is limited to areas of natural forest/woodland not degraded by overgrazing. <i>Pinus caribaea</i> , <i>P. kesiya</i> and <i>P.oocarpa</i> on remaining areas.
E	Seasonally water logged swamps	Flatness of valleys with luxuriant growth of <i>Loudetia phragmito</i> ides grass reduce fast flow of rain water-it stagnates long. Water logging every rainy season. Water level depends on frequency of rain and amount of rain at a time	499	Site considered unplanted, but scattered termite mounds with good soil for <i>cereal odorata</i> , <i>Khaya anthotheca</i> and <i>Measopsis eminni</i> . No of trees per mound of final crop 1-2.
	TOTAL		6740	

Appendix 14: Annual schedule of activity 2008/9

Main Activity	Sub-activity	MONTHS											
		Jan	Feb.	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Nursery work	Procure seed												
	Sow seed												
	Nursery maintenance												
Plantation establishment	Planting												
	Weeding												
Plantation tending	Pruning												
	Thinning												
Harvesting	Supervision of harvesting												
	Boundary patrols												
	Boundary maintenance												
Fire protection	Community education awareness												
	Clearing boundary/fire lines												
	Fire tower lookouts												
Buildings	Katugo station maintenance												
Planning	Prepare annual work plan												
	Review AWP												

Appendix 15: Expenditure for Year 2004-2005

Activity	Q1	Q2	Q3	Q4	TOTAL
Seedling production	12,973,000	8,623,000	2,370,000	2,370,000	26,336,000
Plantation establishment	20,251,000	48,366,000	11,000,000	20,383,000	100,000,000
Weeding old plantings	5,169,000	7,960,000	7,800,000	7,800,000	28,729,000
Tending	0	5,000,000	0	0	5,000,000
Fire line control	475,500	560,000	990,500	200,000	2,225,000
Fire line maintenance	0	3,000,000	1,000,000	0	4,000,000
Perimeter fence	0	1,700,000	0	0	1,700,000
Permanent sample plots (PSPs)	0	600,000	600,000	300,000	1,500,000
Maintenance of buildings	0	700,000	800,000	1,000,000	2,500,000
Roads	0	8,000,000	0	0	8,000,000
Vehicle fuel	1,256,600	1,443,400	1,636,000	1,443,400	5,779,400
Vehicle maintenance	187,500	187,500	187,500	187,500	750,000
Vehicle service/repairs	375,000	375,000	375,000	375,000	1,500,000
Motorcycles (fuel and repairs)	1,920,600	1,920,000	1,920,600	1,920,600	7,682,400
Night allowance (ZM)	144,000	144,000	144,000	144,000	576,000
Night allowance(SM)	288,000	288,000	288,000	288,000	1,152,000
Night allowance (supervisors)	480,000	480,000	480,000	480,000	1,920,000
Night allowance (drivers)	432,000	432,000	432,000	432,000	1,728,000
SDA (ZM)	18,000	18,000	18,000	18,000	72,000
SDA(SM)	36,000	36,000	36,000	36,000	144,000
SDA (drivers)	30,000	30,000	30,000	30,000	120,000
Airtime (ZM)	100,000	100,000	100,000	100,000	400,000
Prepare FMP for few FRs	500,000	9,700,000	0	0	10,200,000
Patrols	250,000	750,000	1,250,000	1,250,000	3,500,000
Fostering work arrangements	0	0	1,500,000	0	1,500,000
Strengthening participatory approaches	75,000	75,000	75,000	75,000	300,000

Activity	Q1	Q2	Q3	Q4	TOTAL
Stakeholders meet on SFM	0	0	0	1,750,000	1,750,000
TOTAL	44,960,200	100,488,500	33,032,600	40,582,500	219,063,800

Source: adapted from NFA/Luwero complex zone 2004-2005 budgets.

Appendix 16: Summary of Views/Opinions from Community Consultations

Problems/issues/concerns discussed and views/opinions

Products/benefits/advantages from forests	How forest resources are used	Threats from or to forests	Problems experienced by communities	Proposals for the FMP
<p>Pasture, firewood, herbal medicines, fruits, sand, charcoal, timber, building poles, thatching grass, employment, cultivating and settling, in FRs, wild animal meat, grazing, rain, employment, quarry stone, clay, education facility, wind barriers, vegetables, vegetables, environment protection, conserving soil</p>	<p>Indiscriminate tree cutting, limited and over grazing (illegal), cultivation and settlements in FRs, bush burning for pasture/carelessness, collecting firewood, selective cutting of trees, hunting, hiding place during hard time (war) or bad people, habitat for wild animals and birds, unlicensed charcoals burning, cutting timber from Katugo (plantation)</p>	<p>(a) From forests Animals and birds destroy crops, cattle ticks, snakes, hideout for thieves, mosquitoes, over shadowing adjacent crops, wild animals eat domestic animals</p> <p>(b) To forests Setting bush fires, cutting all mature trees, no seeds for regeneration, indiscriminate tree cutting, over grazing, cutting trees without planning, poor management by FD (Katugo plantation), clearing a forest without planned use/activity.</p>	<ul style="list-style-type: none"> • Evicted people abandon gardens and loose property • Inadequate employment • Poverty and famine • People employed not paid • Lack of know how on forest and tree growing • People settled by government being evicted • Local people denied jobs and importing labour from outside • Poor working relations (FD and community) • Lack of water for human and animals use. • Lack of seedlings for people to plant trees • Evicting people without alternative land for settlement • Built development projects threatened by eviction e.g. schools, dispensary • Termites but no effective insecticide 	<ul style="list-style-type: none"> • Issuing of grazing licences in FRs • Permits to cultivate while planting trees • Allow grazing and trade in forest products • Provision of water for human and animal use • Good relationship between FD/NFA and communities • Legalise existing encroachment/settlements in Kyalubanga and Wabisi wajala • Education/awareness on forestry matters, land policy • NFA/Government find land for exchange • Training people in tree planting and care for trees/forests • Clear marking for forest reserves boundaries

Appendix 17: COMPARTMENT YIELDS AS OF OCTOBER 2007

Forest Reserve:
Katugo
Area: 3318Ha
Ownership: National Forestry Authority

Compt	Area Ha	Species Source	Variety	Estab. Date	Age YY-MM	Plantable Ha	Standing Ha	% Surv.	Fell YY	Fell age	M.A.I.	Remarks	Batch No.
2 (II)	27	P.oocarpa	Okarveru	2005 04	0 06	27	27	75	2025 04	20		NFA	0
2 (II)	2.5	P.caribaea	Hondurensis	2005 09	0 01	2.5	2.5	80	2025 09	20		NFA	
2 (I)	25.8	P.caribaea	Hondurensis	2005 04	0 06	25.8	25.8	81	2025 04	20		NFA	3982
3	6	P.oocarpa	Katugo	2005 09	0 01	6	6	75	2025 09	20		NFA	
3	29	P.caribaea	Hondurensis	2005 09	0 01	29	29	75	2025 09	20		NFA	
4	89	P.caribaea	Hondurensis	2005 03	0 07	89	89	79	2025 03	20		NFA	3982
5I	30	P.caribaea	Hondurensis	2005 04	0 06	60	60	85	2025 03	20		NFA	3982
5II	23	P.caribaea	Hondurensis	2005 04	0 06	14	14	73	2025 03	20		NFA	3982
5 III	15	P.caribaea	Hondurensis	2006 04	1 06			74					
5III	12	P.oocarpa	Okavureru	2005 04	0 06	12	12	60	2025 03	20		NFA	0
6I	78	P.caribaea	Hondurensis	2005 09	0 01	78	78	87	2025 09	20		NFA	
6IIa	14	P.caribaea	Hondurensis	2003 11	1 11	14	14	84	2023 11	20		FRMCP	
6II	8	P.caribaea	Hondurensis	2004 10	1 00	8	8	70	2024 10	20		NFA	
6II	32	P.oocarpa	Gulu	2004 10	1 00	32	32	47	2024 10	20		NFA	
7III	30	P.caribaea	Hondurensis	2004 04	1 00	30	30	82	2024 04	20		FRMCP	
7IV	20	P.caribaea	Hondurensis	2004 04	1 00	20	20	76	2024 04	20		FRMCP	

7V	20	P.caribaea	Hondurensis	2004 10	1 00	20	20	80	2024 10	20		NFA	
7VI	30	P.caribaea	Hondurensis	2004 10	1 00	30	30	74	2024 10	20		NFA	
8 (I)	11	P.caribaea	Hondurensis	2005 09	0 01	11	11	65	2025 09	20		NFA	
8II	2	P.caribaea (Seed)	Hondurensis	2005 05	1 00	2	2	82	2025 04	20		NFA	
8 (II)	33	P.caribaea	Hondurensis	2005 09	0 01	33	33	87	2025 09			NFA	
8III	27	P.caribaea	Hondurensis	2004 10	1 00	62	62	64	2024 10	20		NFA	
8IV	30	P.caribaea	Hondurensis	2004 10	1 00	30	30	68	2024 10	20		NFA	
8V	30	P.caribaea	Hondurensis	2004 10	1 00	30	30	52	2024 10	20		NFA	
8VI	30	P.oocarpa	Okavureru	2005 04	0 06	15	15	32	2025 04	20		NFA	
8 (VI)	8	P.caribaea	Hondurensis	2005 09	0 01	8	8	87	2025 09	20		NFA	
8 (VI)	8.2	P.oocarpa	Katugo	2005 09	0 01	9	9	71	2025 09	20		NFA	
9I	11	P.caribaea	Hondurensis	2004 10	0 00	7	7	67	2024 10	20		NFA	

Appendix 18: Programme for Katugo MPA Community Consultations

CFR	No.	Communities	Date & Time
KATUGO	(1)	Kyampisi, Kinyogoga, Kiranga, Bamusuuta, Katikakalu, Kakira and Kyabutayiga- <i>Meeting at Bamusuuta Trading Centre</i>	22/9/ 2006 10: 00 a.m.
	(2)	Kyandyanga, Kasambya, Kyalubambula, Kyankonwa and Kyalweza, Mayirye- <i>Meeting at Kyankonwa</i>	22/9/ 2006 02: 00 p.m.
	(3)	Wakakoli, Katugo, Kyabukonyogo, Kinoni, Kasanga and Kyamilimbye- <i>Meeting at Katugo</i>	22/9/ 2006 04: 00 p.m.
KASAGALA	(1)	Mitanzi, Kalungu, Walulayi, Malengera- <i>Meeting at Kalungu</i>	22/9/ 2006 10: 00 a.m.
	(2)	Kiralamba, Butenga, Kiwongoyire, Kittanswa- <i>Meeting at Kiralamba Trading Centre</i>	22/9/ 2006 10: 00 a.m.

Appendix 19: Roundwood Revenue Forecast For Katugo For The Period 2008-2028

Planting Year	CPT	Species	Area Mapped	Thinning year	Projected Thinning volume	Rate	Amount	Final felling year	Projected final harvest volume	Rate	Amount
1972/73	8	P.caribaeaa						2008/09	1074	62,500	67,125,000
1973/74	9	P.caribaeaa						2008/09	30000	62,500	1,875,000,000
1974	11	P.caribaeaa						2009/10	40850	62,500	2,553,125,000
1975	13	P.caribaeaa						2009/10	8154	62,500	509,625,000
1976	15	p. caribaeaa						2011	20000	62,500	1,250,000,000
1991	15	<i>P. Caribaea</i>	10	2002		37500	0	2012	3500	75,000	262,500,000
1992	15	<i>P. Caribaea</i>	10	2003		37500	0	2013	3500	75,000	262,500,000
1993	15	<i>P. oocarpa</i>	5	2004		37500	0	2014	1750	75,000	131,250,000
1994	1	<i>P. oocarpa</i>	20	2005		37500	0	2015	7000	75,000	525,000,000
1998	1	<i>P. oocarpa</i>	6	2009	240	37500	9,000,000	2019	2100	75,000	157,500,000
1998	3	<i>P. Carribaea</i>	15	2009	600	37500	22,500,000	2019	5250	75,000	393,750,000
1998	4	<i>P. Caribaea</i>	11	2009	440	37500	16,500,000	2019	3850	75,000	288,750,000
1998	6	<i>P. Caribaea</i>	37	2009	1480	37500	55,500,000	2019	12950	75,000	971,250,000
1998	7	<i>P. Caribaea</i>	40	2009	1600	37500	60,000,000	2019	14000	75,000	1,050,000,000
1998	8	<i>P. Caribaea</i>	24	2009	960	37500	36,000,000	2019	8400	75,000	630,000,000
2001	1	<i>P. oocarpa</i>	7	2012	280	37500	10,500,000	2022	2450	75,000	183,750,000
2001	2	<i>P. oocarpa</i>	23	2012	920	37500	34,500,000	2022	8050	75,000	603,750,000

2003	6	<i>P. caribaea</i>	14	2014	560	37500	21,000,000	2024	4900	75,000	367,500,000	
2004	6	<i>P. caribaea</i>	8	2015	320	37500	12,000,000	2025	2800	75,000	210,000,000	
2004	6	<i>P. oocarpa</i>	32	2015	1280	37500	48,000,000	2025	11200	75,000	840,000,000	
2004	7	<i>P. caribaea</i>	100	2015	4000	37500	150,000,000	2025	35000	75,000	2,625,000,000	
2004	8	<i>P. oocarpa</i>	30	2015	1200	37500	45,000,000	2025	10500	75,000	787,500,000	
2004	8	<i>P. caribaea</i>	87	2015	3480	37500	130,500,000	2025	30450	75,000	2,283,750,000	
2004	9	<i>P. caribaea</i>	11	2015	440	37500	16,500,000	2025	3850	75,000	288,750,000	
2005	2	<i>P. oocarpa</i>	27	2016	1080	37500	40,500,000	2026	9450	75,000	708,750,000	
2005	2	<i>P. caribaea</i>	28.3	2016	1132	37500	42,450,000	2026	9905	75,000	742,875,000	
2005	3	<i>P. oocarpa</i>	6	2016	240	37500	9,000,000	2026	2100	75,000	157,500,000	
2005	3	<i>P. caribaea</i>	29	2016	1160	37500	43,500,000	2026	10150	75,000	761,250,000	
2005	4	<i>P. caribaea</i>	89	2016	3560	37500	133,500,000	2026	31150	75,000	2,336,250,000	
2005	5	<i>P. oocarpa</i>	12	2016	480	37500	18,000,000	2026	4200	75,000	315,000,000	
2005	5	<i>P. caribaea</i>	68	2016	2720	37500	102,000,000	2026	23800	75,000	1,785,000,000	
2005	6	<i>P. caribaea</i>	78	2016	3120	37500	117,000,000	2026	27300	75,000	2,047,500,000	
2005	8	<i>P. caribaea</i>	61.2	2016	2448	37500	91,800,000	2026	21420	75,000	1,606,500,000	
2006	5	<i>P. caribaea</i>	15	2017	600	37500	22,500,000	2027	5250	75,000	393,750,000	
2007	15	<i>P. caribaea</i>	26	2018	1040	37500	39,000,000	2028	9100	75,000	682,500,000	
2007	8	<i>P. caribaea</i>	10	2018	400	37500	15,000,000	2028	3500	75,000	262,500,000	
2007	7	<i>P. caribaea</i>	15	2018	600	37500	22,500,000	2028	5250	75,000	393,750,000	
2008	1	<i>P. caribaea</i>	4.8	2019	192	37500	7,200,000	2029	1680		-	
2008	15	<i>P. caribaea</i>	33	2019	1320	37500	49,500,000	2029	11550		0	
2008	12	<i>P. caribaea</i>	30	2019	1200	37500	45,000,000	2029	10500		0	
2008	9	<i>P. caribaea</i>	34.5	2019	1380	37500	51,750,000	2029	12075		0	
2008	10	<i>P. caribaea</i>	28	2019	1120	37500	42,000,000	2029	9800		0	
					TOTAL	41,592		1,559,700,000		479,758		31,310,500,000

Appendix 20: ROUNDWOOD REVENUE FORECAST FOR KASAGALA FOR THE PERIOD 2008-2028

Planting year		Species	Area	Thinning year	Projected Thinning volume	Rate	Amount	Final felling year	Projected final harvest volume	Rate	Amount
2002		<i>P. caribaea</i>	10	2013	400	37500	15,000,000	2023	3500	75000	262,500,000
2003		<i>P. caribaea</i>	14.8	2014	592	37500	22,200,000	2024	5180	75000	388,500,000
2003		<i>P. oocarpa</i>	2	2014	80	37500	3,000,000	2024	700	75000	52,500,000
2003		<i>P. oocarpa</i>	5.4	2014	216	37500	8,100,000	2024	1890	75000	141,750,000
2004		<i>P. caribaea</i>	30	2015	1200	37500	45,000,000	2025	10500	75000	787,500,000
2004		<i>P. oocarpa</i>	14	2015	560	37500	21,000,000	2025	4900	75000	367,500,000
2005		<i>P. caribaea</i>	7.4	2016	296	37500	11,100,000	2026	2590	75000	194,250,000
2007		<i>P. caribaea</i>	23	2018	920	37500	34,500,000	2028	8050	75000	603,750,000
2008		<i>P. caribaea</i>	22	2019	880	37500	33,000,000	2029	7700		0
							192,900,000				2,798,250,000