

**MINISTRY OF ENVIRONMENT AND TOURISM
DIRECTORATE OF FORESTRY**



**INTEGRATED FOREST MANAGEMENT PLAN FOR HANS
KANYINGA COMMUNITY FOREST**

Otsub, M.D., Omoro, L.M.A ,Mutabazi, S.P., and J. Mwiikinghi

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Abbreviations and Acronyms

AET	Agricultural Extension Technician
AIDS	Acquired Immune Deficiency Syndrome
DED	German Development Service
DoF	Directorate of Forestry
FF	Farm Forester
FMC	Forest Management Committee
FMPU	Forest Management Planning Unit
HF	Honorary Forester
HIV	Human Immune Virus
IRDNC	Integrated Rural Development and Nature Conservation
MAWRD	Ministry of Agriculture, Water and Rural Development
MET	Ministry of Environment and Tourism
NMS	Namibia Meteorological Service
MWTC	Ministry of Works, Transport and Communication
NFFP	Namibia Finland Forest Programme
NOLIDEP	Northern Livestock Development Project
PIFM	Participatory Integrated Forest Management

Executive Summary

Hans Kanyinga community forest is situated in the eastern part of Rundu district situated approximately 115 km east of Rundu in Kavango region.

The Hans Kanyinga Community Forest was created in 2002. Approximately 1,300 people inhabit the area, which consists of 112 households (FMC, pers. comm., 2003). Local people from adjacent settlements utilize community forest resources for subsistence as well as income generation.

The community has an overall objective to sustainably manage the forest resources and conserve biodiversity, while deriving benefits of wood and non-wood products of the forest for their own use and sales to generate income.

Currently, the community harvests about 17,000 poles (Omoró *et al*, unpublished, 2003) from their surroundings, which includes the community forest. Annually about 143,000 poles can be harvested from the forest for both own consumption and sales. However, they intend only to harvest 150 poles for selling during the first year and gradually increase the harvest as demand warrants.

In addition, the community consumes about 294 tones of fuel wood annually (Omoró *et al*, unpublished, 2003). About 11,600 tones of fuelwood can be harvested per annum which is equivalent to 23,200 dead trees. They used about 3 tones of thatching grass for construction annually. The expected annual revenue from the sales of woody products is about N\$ 34,000.

The management plan is developed in close cooperation between the community of Hans Kanyinga and Directorate of Forestry (DoF). The plan is for an area of about 12,107 hectares which is the Hans Kanyinga community forest. This plan will be valid for 10 (ten) years, 2004 to 2013. The annual operational activities will be revised and modified annually according to the experience.

Community Forest Management Committee will implement the plan assisted by DoF. There will be clearly defined roles in the collaboration between the FMC and DoF whereby DoF's role will be to provide technical support.

1. Introduction

The forest management plan for Hans Kanyinga has been formulated to allow the community to be able to manage and utilize their forest resources sustainably. Hans Kanyinga forest is a resource which belongs to four villages namely Vikota, Kappa Hedi, Tara tara and Shinunga. It covers approximately an area of 30,000 hectares. It is predominantly covered by *Burkea africana*, *Dialium engleranum*, *Guibourtia coleosperma* *Pterocarpus angolensis* and some others. There are considerable stems of good timber quality for these four species (Kamwi, 2003). This plan will therefore, explore ways in which these dominant species can be utilized for the welfare of this community. Special attention will also be given to pasture and other grazing resources which is the main benefit the community derive from the forest. Thatching grass is important for the community for shelter and in a limited way is sold to the outside market, medicinal plants especially Devil's claw which is heavily harvested will also be planned for. Attention will also be paid to environmental forestry concerns by the community especially for watersheds, socio-cultural and biodiversity purposes.

This forest management plan has been drafted with the participation of the members of the FMC of Hans Kanyinga. The role of the Directorate of Forestry will be to facilitate the implementation and monitoring of the activities to see if they are being conducted in conformity with the IFMP. The partnership agreement between the DoF and Forest management committee (FMC), has also outlined the specific roles, each party has to play in ensuring that the activities are carried out as expected.

This IFMP will be valid for 10 years, 2004 to 2013. The annual operational activities must be revised by 1st of September of each proceeding year.

There are no major agencies working in Hans Kanyinga *per se*, however, efforts will be made to integrate the livelihood activities of the community as much as possible. This plan has incorporated many activities as were identified by the community. The community members have played significant roles at different levels of the formulation of this plan which include resource assessment and socio-economic survey. The formulation of this IFMP has been based on the guidelines developed by the Forest Management Planning Unit (FMPU) of the Directorate.

2. Ownership and management of the area

Hans Kanyinga Community Forest belongs to four villages namely Vikota, Tara Tara, Shinunga and Kapupa Hedi in the VaGciriku district of Kavango-east. The people settled in the area in 1958 having come from Mabushe, Ngona, Shitemo, Cavazi, Ndonga Linena, Makendu and Kayengona areas along the Kavango river. The main reasons for this settling in these areas were purposely to find space where the community could cultivate and graze their livestock. The population is estimated at 1,300 with 112 households.

The community forest is communal under the jurisdiction of Vagciriku with all the administrative issues undertaken by the senior Headman on behalf of the Chief. The implementation of this IFMP will be facilitated by the two main community institutions that have been established viz FMC and the Honorary Foresters, Fig 1.

Organogram of Community Institutions

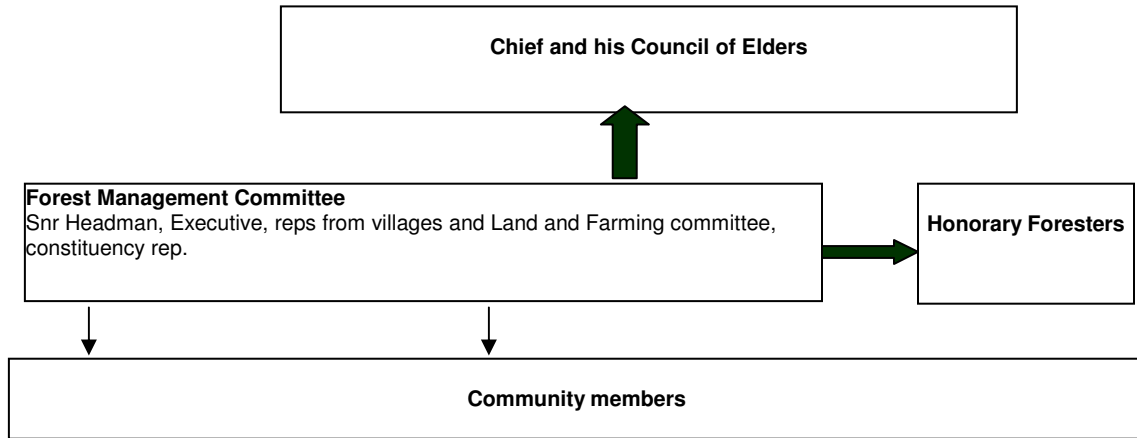


Figure 1 The Management Structure within the Hans Kanyinga community forest
(Source: Omoro *et al.*, unpublished, 2003)

The FMC’s duties are routine administration of community forestry activities in the area. They are answerable to the Chief through the Senior Headman who is the patron of the committee. They supervise the Honorary Foresters in order to ensure that activities in the forest are done according to the plan. They are also responsible for sourcing of resources required by the community and eventually distribution of the accruals from the forest.

The Honorary Foresters roles are forest patrols, training and working with the community on specific aspects of forest management.

3. Overall goal

The main goal of this plan is to allow the community of Hans Kanyinga to utilize their forest resources as well as to be able to attainment the benefits from sale of the said forest resources such as the woody and non-woody products.

4.0 Physical description of the area

4.1 Location

Hans Kanyinga Community Forest lies on latitudes $18^{\circ} 8' 26''$ S and $18^{\circ} 18' 21''$ S and Longitudes $20^{\circ} 11' 54''$ E and $20^{\circ} 27' 46''$ E. It is within Ndiyona Constituency in Kavango region. It lies at about 900m above sea level and located at approximately 115 km South-east of Rundu.

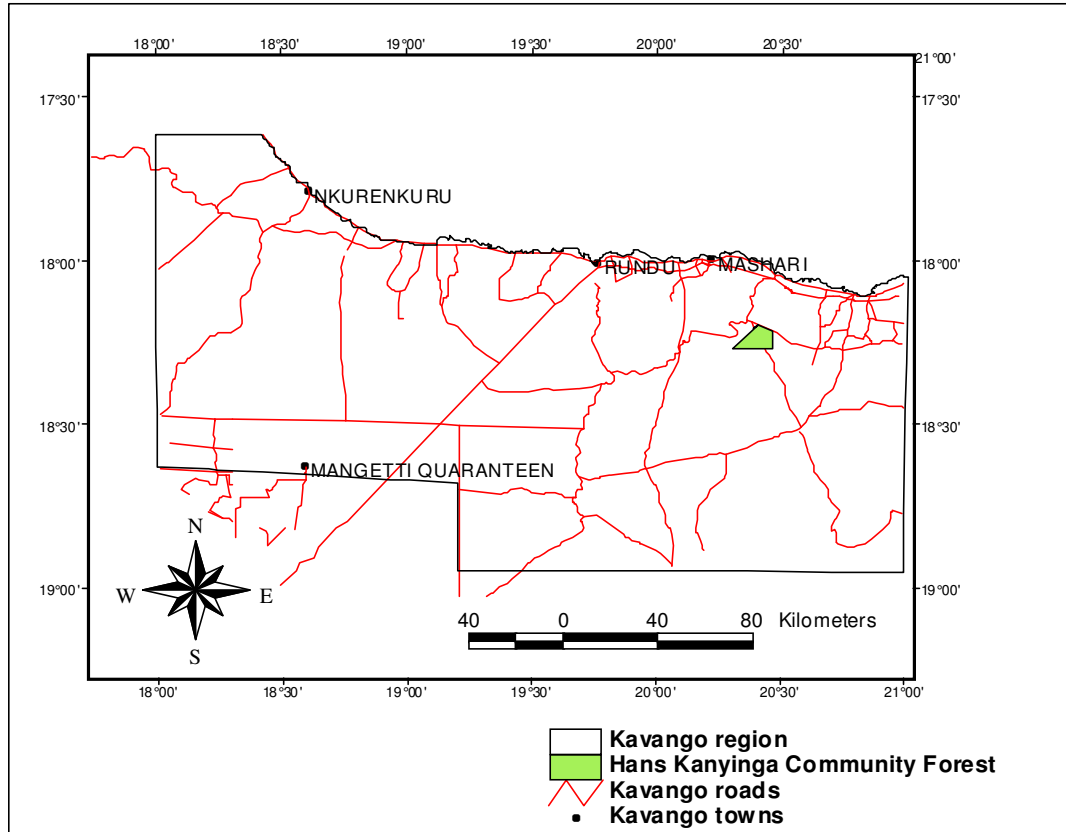


Figure 2 Location map for Hans Kanyinga Community Forest

4.2 Climate, Hydrology, Vegetation and Soils

The area receives on average annual rainfall of 500 mm (see figure 3), with an annual average temperature of 22°C . The soils are predominantly ferratic arenosols (Mendelsohn and Roberts, 1997). The area has undulating topography with few Omurambas cutting across the area (Mendelsohn and Roberts, 1997).

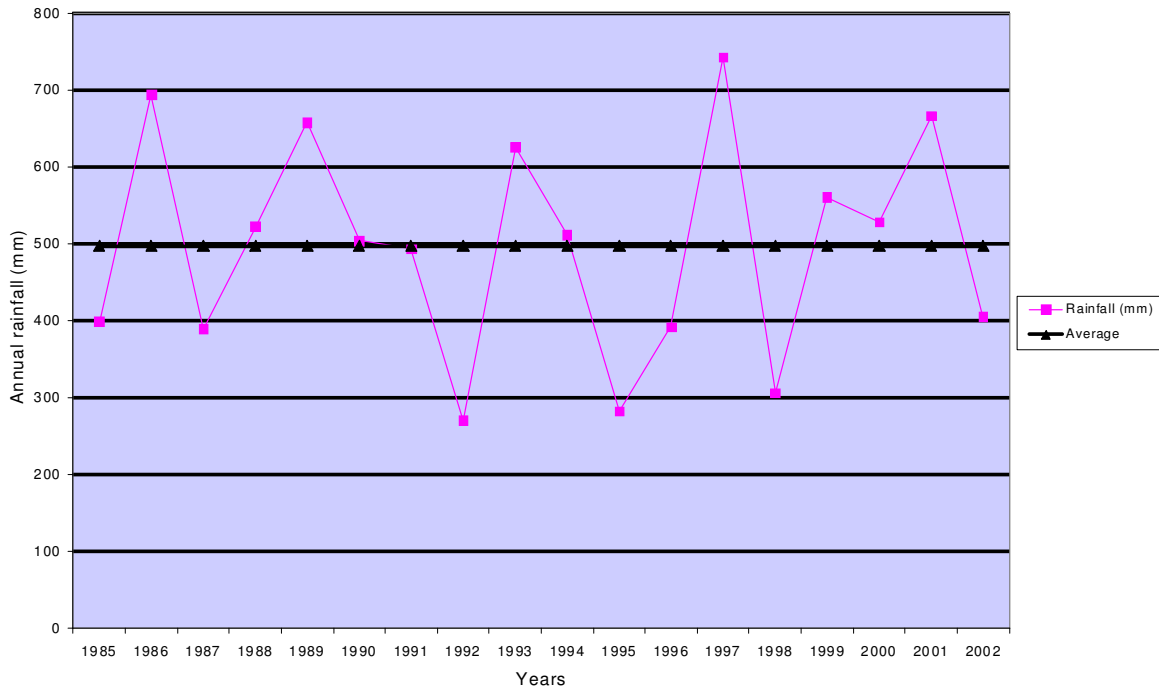


Figure 3 Total annual rainfall in Kavango region (Source: Namibia Meteorological Services, 2003)

As per the forest inventory undertaken the forest comprises of some four dominant timber species of *Burkea africana*, *Dialium engleranum*, and *Guibourtia coleosperma* *Pterocarpus angolensis* (Kamwi, 2003). There are also some fruit tree species that are important for the livelihood of the community such as *Monkey orange*, *Mangetti*. There are also non woody forest products such the Devil’s claw within the forest such as the devil’s claw and grass which are in the forest but were not inventoried.

5. Forest resources

5.1. Trees

Altogether 26 tree species were identified in the inventory with a total of 2,320,000 stems in the inventory area that is 192 stems per hectare. The most frequent species is *Burkea africana* with 803,000 trees growing in the inventory area. The second most frequent species is *Pterocarpus angolensis*, with only 211,000 stems. The third most frequent species are *Combretum collinum* and *Terminalia sericea* with the 140,000 and 123,000 species respectively. All other trees have a significantly smaller number of stems (see table 1 in Annex 2).

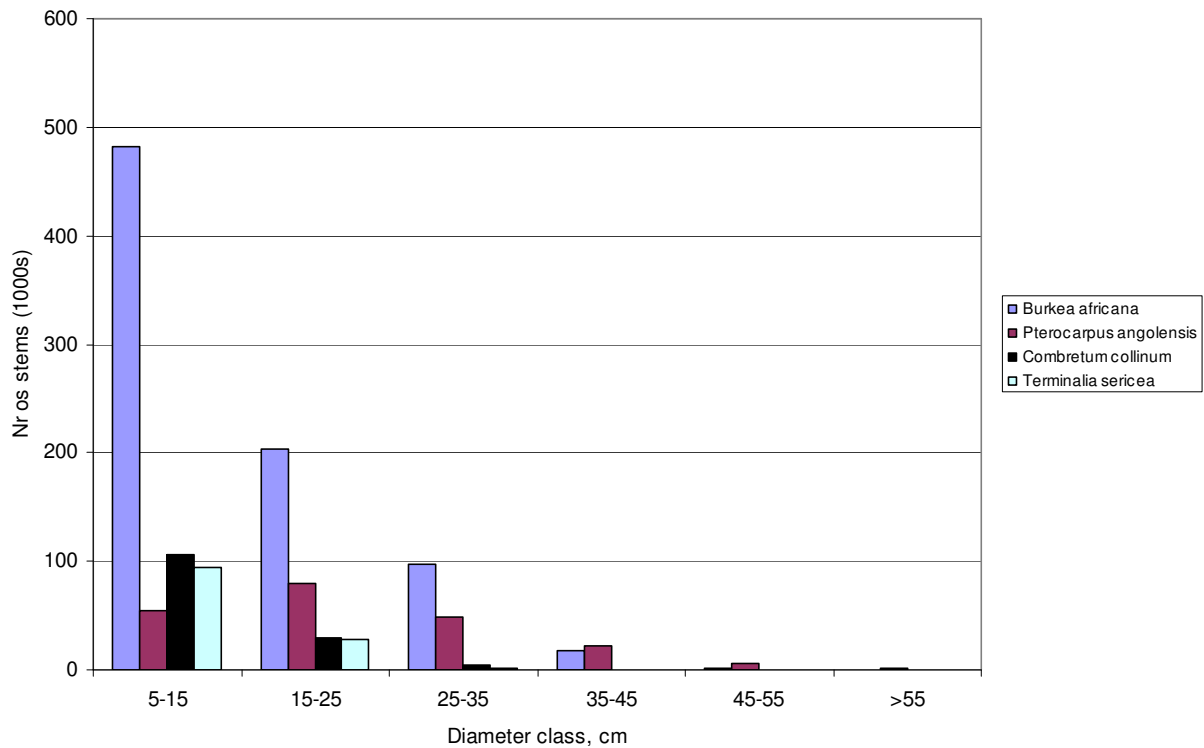


Figure 4 Diameter distribution of the four most frequent tree species

The diameter distribution of burkea is good, there is a large number of small trees, however very few big trees. About 60% of all *Burkea africana* stems are less than 15 cm at breast height. This gives a potential for harvesting some poles and rafters without risking the future of the forest structure. About 76 % of *Combretum collinum* stems are less than 15 cm at breast height, however the overall distribution is not good. *Terminalia sericea* has similar trend, however it has much lesser stems compared to the other two species. The possibilities for sustainable utilization of trees in the inventory are mainly related to *Burkea africana*, *Combretum collinum*, *Pterocarpus angolensis* and *Terminalia sericea*.

The total volume of all live trees is 489,112 m³. The total volume of *Burkea africana* is 169,072 m³, *Pterocarpus angolensis* is 83,169 m³, for *Combretum collinum* is 13,014 m³ and *Terminalia sericea* 8,495 m³. *Guibourtia coleosperma* has 78,249 m³; however it is neither used for either construction or as fencing materials.

5.2 Deadwood

Thirteen dead tree species were identified in the inventory area, with a total number 232,000 stems (Kamwi, 2003). Most of the dead trees were mostly found in smaller diameter classes, where 73.7 % is recorded; however, dead trees with bigger dbh were found of *Burkea africana* and *Pterocarpus angolensis*.

There is a total volume of 27,724 m³ of deadwood in Hans Kanyinga community forest (Kamwi, 2003). More than 56 % of the volumes are from *Burkea africana* and *Pterocarpus angolensis* trees. Dead trees with bigger diameter are especially *Pterocarpus angolensis*.

5.3 Shrubs and regeneration

All together 1,488 shrubs and saplings per hectare were recorded growing in the inventory area (Kamwi, 2003). 15 different species were identified. *Ochna pulchra*, 395 saplings and *Burkea africana*, 378 saplings have got vigorous regeneration per hectare. *Combretum collinum* has a good regeneration as well of 110 saplings per hectare but less much as former. Part of saplings will grow to become trees first in the smaller diameter classes and replacing trees which will grow into bigger classes or which might be harvested.

5.4 Estimation of sustainable yield (allowable cut)

The tables of the calculations for the allowable harvest of *Burkea africana*, *Combretum collinum*, *Pterocarpus angolensis*, *Terminalia sericea* and *Baikiaea plurijuga* are presented below. The calculation is based on the growth of the trees and the movement of stems from smaller diameter classes into bigger diameter classes. The main objective in the calculation is that the diameter distribution during the ten years period of the implementation of the plan will remain constant. This implies that the structure of the forest would remain the same in the future too.

Harvesting is proposed to be done only in the four smallest diameter classes as the inventory showed that the number of the big trees is not enough. Also, it has been suggested that the wildlife specifically benefits larger trees. A mortality rate of 20 % has been used in the calculations. In practice, portion of these dying trees can be harvested too. However, in the following calculation this has not been taken into account.

Table 1 Calculation of sustained yield of *Burkea africana* (for an area of 12,107 hectares)

DBH class cm	No. of stems/ha	No. of stems after 10 years	Total stems in area	Annual cut in 10 years
5-15	32	41	104,604	10,460
15-25	17	26	109,932	10,993
25-35	8	20	146,882	14,688
35-45	2	60	702,303	70,230
			Total	106,371

The calculation above results in the following proposal of annual harvest of *Burkea africana*, which is about 10,400 stems with an average diameter between 5 and 15 cm, 11,000 stems of average diameter between 15 and 25 cm, 14,700 stems with an average

diameter between 25 and 35 cm and 70,000 stems with an average diameter between 35 and 45 cm. There are not enough big trees (diameter > 45cm) for harvesting currently.

Similarly, the calculation of the sustained yield for *Pterocarpus angolensis* is presented in table 2. According to calculation, there are not enough trees for harvesting in the classes below the diameter of 25 cm and beyond 35 cm. Hence, no harvesting is proposed in these classes.

Table 2 Calculation of sustained yield of *Pterocarpus angolensis* (for an area of 12,107 hectares)

DBH class cm	No. of stems/ha	No. of stems after 10 years	Total stems in area	Annual cut in 10 years
25-35	4	5	9322	932
35-45	2	6	50123	5012
			Total	5,944

It is proposed from the results in the table 2 that 5,900 stems with average diameter of less than 25 cm and bigger than 45 cm can be harvested annually.

Table 3 Calculation of sustained yield of *Combretum collinum* (for an area of 12,107 hectares)

DBH class cm	No. of stems/ha	No. of stems after 10 years	Total stems in area	Annual cut in 10 years
5-15	9	11	31381	3138
15-25	2	6	41454	4145
25-35	1	4	43101	4310
			Total	11,593

Furthermore, the calculation of the sustained yield for *Combretum collinum* is presented in table 3. According to calculation, there are not enough trees for harvesting in the classes beyond the diameter of 35 cm. Hence, no harvesting is proposed in these classes. However, 3,100 stems could be harvested in an average diameter below 15 cm, 4,100 stems in an average diameter between 15 and 25 cm. In addition, 4,300 stems could be harvested in an average diameter between 25 and 35 cm.

Table 4 Calculation of sustained yield of *Terminalia sericea* (for an area of 12,107 hectares)

DBH class cm	No. of stems/ha	No. of stems after 10 years	Total stems in area	Annual cut in 10 years
5-15	8	10	27,991	2799
15-25	2	5	36,079	3608
25-35	1	3	39,609	3,961
			Total	10,368

Also, calculation below results in the following proposal of annual harvest of *Terminalia sericea*, which is about 2,800 stems with an average diameter between 5 and 15 cm, 3,600 stems of average diameter between 15 and 25 cm, 3,900 stems with an average diameter between 25 and 35 cm. There are not enough big trees (diameter > 35cm) for harvesting currently.

Table 5 Calculation of sustained yield of *Baikaea plurijuga* (for an area of 12,107 hectares)

DBH class cm	No. of stems/ha	No. of stems after 10 years	Total stems in area	Annual cut in 10 years
15-25	1	3	17,143	1,714
25-35	1	2	12,737	1,274
35-45	1	6	66,952	6,695
			Total	9,683

Finally, the calculation of the sustained yield *Baikaea plurijuga* is presented in table 5. According to calculation, there are not enough trees for harvesting in the classes below the diameter of 15 cm. Hence, no harvesting is proposed in these classes. About 1,700 stems could be harvested from average diameter between 15 and 25 cm, 1,300 stems could be harvested from 25 and 35 cm. In addition, 6,700 stems could be harvested from an average diameter between 35 and 45 cm.

The total harvesting potential is about 143,000 stems from five tree species annually. However, the Hans Kanyinga community would like to harvest only 20% of the annual allowable cut, which accounts 28,700 stems.

It must be noted that the calculation of sustained yield here is very sensitive to the estimate for the natural mortality of 20 per cent used for the diameter classes. If would for example be doubled of the one used, the allowable cut would be only half as much as amount given here.

6. Current use of the resources

According to the Hans Kanyinga Community Forest Committee, people living in the area are not extracting woody resources from the proposed community forest area. There are about 112 households in the settlement adjacent to the Community Forests (FMC, 2003).

According to the interviews conducted with the community, at average about 120 poles are needed per household to construct or renovate a house (FMC, 2003). Every year 10 new houses are constructed and 7 houses renovated, which consumed 1,200 and 840 poles respectively. In total about 2,040 poles of the preferred species, *Terminalia sericea*, *Combretum collinum* and *Burkea africana* will be required for both construction and renovation in a year. However, according to Omoro et al., (2003) community extract up to 17,000 poles for both domestic consumption and selling. This is far below the sustained yields of 143,000 poles estimated in calculation. It seems that the proposed community

forest is not the main source for construction poles. Even if it was, the harvest is still within sustainable amounts.

Also, during the one-day training workshop conducted with the working group, most of the interviewees confirmed that they collect 7.2 kg fuel wood bundle three times per week. However, according to the participants, a normal family (ten members) consumes one bundle of averaged 7.2 kg per day. This translates into 5,645 kg of fuel wood consumed by the whole settlement per week. Their annual consumption is 293,530 kg or 294 tones of fuel wood for the whole settlement.

The inventory results have given about 19 dead trees per hectare and a total of 232,000 dead trees in the inventory area (Kamwi, 2003). It is difficult to predict sustained yield for fuel wood because annual accumulation of deadwood biomass is difficult to determine accurately. Hence, it is cautiously proposed that 10% of total dead trees being harvested for fuel wood annually for the harvesting cycle of 10 years. This would result in 23,200 dead trees being harvested for fuel wood annually. On average a tree can produce up to 0.5 tones of fuelwood. Thus, 23,200 trees can produce 11,600 tones of fuelwood.

In addition, thatching grasses are used a lot in construction and renovation of houses. In house construction a small and a large house consume on average 15 and 20 bundles respectively. An average weight of the bundles is 5 kg, thus on average 3 tones of thatching grass is used for construction annually.

The information on the quantities of non-woody forest products utilized by the community is very patchy. Therefore, no prediction was made on sustain yields for the products.

It is increasingly an important issue to define the community forest area. Generally, community members do not utilize resources from the smaller core area (inventoried area). However, they are using resources from the area as whole. According to the working group, communities collect some forest resources (woody and non-woody) as far as about two to three kilometer radius from their homesteads. It is easy to sustainably manage a smaller core area than the larger area as whole. Therefore, it is very important that the DoF staff and Forest Management Committee come together and address this issue, so that the area as the whole will eventually be under sustainable management too.

7. Specific objectives for forest management

7.1 Pole extraction

The harvesting of forest resources within the Hans Kanyinga community forest will be based on the inventory results as well as intended products. Medium sized poles with a diameter of 10 to 15 cm would be preferred as this is suitable size utilized for hut construction and home courtyard fencing. Rafters will only be harvested in densely forested areas and also while taking care of coppicing management. Big diameter trees

will be allowed to stay in order to serve as seed sources. For craft purposes only big dead diameter trees will be used. No one will be allowed to harvest live trees for wood-carvings. Dead wood will also serve as the sole source of firewood. Thatching grass will be harvested for both domestic and commercial purposes. A market survey and pricing study will be done prior to the harvesting.

7.2 Grazing

Livestock farming plays an important role in the tradition of the community. Therefore, there is a need for livestock to be integrated into forest management planning. Generally, cattle do not reach fringes of Hans Kanyinga community forest's area. Since the livestock are restricted around the settlements, they tend to destroy cropfields because latter are not fence-off. Moreover, due to the fact that the population is rising, settlement expansion is inevitable. Hence, seasonal grazing will be practiced in order to allow enough grazing resources in the area. The community grazed their livestock in the community forest from January to June because; they prevent livestock to destroy cropfields and protection of livestock against predators such as hyenas, wild dogs and leopards. Thus, the area will be wisely grazed by controlling the stocking rates, whereby farmers will graze livestock appropriately without overgrazing the forest. No illegal grazing in community forest is not allowed during the dry season.

7.3 Utilization of dead wood

The inventory results have given about 19 dead trees per hectare and a total of 232,000 dead trees in the inventory area (Kamwi, 2003). It is cautiously proposed that 10% of total dead trees being harvested for fuel wood annually for the harvesting cycle of 10 years. This would result in 23,200 dead trees being harvested for fuel wood annually. On average a tree can produce up to 0.5 tones of fuelwood. Thus, 23,200 trees can produce 11,600 tones of fuelwood.

7.4 Protection of forest

Forest patrols will be organized and conducted regularly to minimize illegal harvesting. Cutlines will be constructed to protect the forest against devastating fires. More environmental awareness campaigns will be conducted to educate people against the abovementioned environmental disasters.

7.5 Thatching grass production

Thatching grasses are used a lot in construction and renovation of houses. In house construction a small and a large house consume on average 15 and 20 bundles respectively. An average weight of the bundles is 10kg, thus on average 12.5 tones of thatching grass is used for construction annually.

7.6 Coppicing

The forest management committee would like to carry out coppicing in the forest. They will do coppicing according to the different tree species and their use. For *Pterocarpus angolensis* 1-2 sprouts will be left per tree. In case of *Dialium engleranum*, 2 sprouts should be left per tree. For *Terminalia sericea*, 5 sprouts should be left per tree. For *Schinziophyton rautanenii*, only male trees should be coppiced.

7.7 Enrichment planting

If seeds or seedlings are available, *Pterocarpus angolensis* and *Mulilia species* should be planted.

7.8 Fire management

Forest should be protected against forest fires. Community should be encouraged and assisted to construct firebreaks or cut lines around the community forested area. They need to be trained on how to carry out prescribed burning and to extinguish forest fires. The forest management committee will be responsible to organize people during the occurrence of forest fires.

7.9 Illegal harvesting of timber

The forest management committee will see to it that the weekly patrols will be conducted by the community honorary foresters. The duties of the honorary foresters are to inspect forest against illegal harvesting, fires and other natural phenomena.

7.10 Zoning according to location, cultural and scientific sites

It is important to note that the harvesting being discussed here refers to woody products. The harvesting of non-wood products will be carried out randomly as need arise. The harvesting of woody resources will be done on rotational basis and hence once the whole area has been covered, the cycle will commence again (see figure 5).

As it is indicated in the figure 5, the forest is divided in 10 blocks different areas for better management and these are Likora layeshemb, Madeghure, Tolingi layeshemb, Katjire, Mukuve, Kambyau, Kumutya, Tcumashi, Mungunga and Shanyumba Forest. For better management and sake of safe control, it is advisable to conduct specific activities within a specified area at a given time. Thus, some silvicultural activities such as fire management and law enforcement may cover the whole area of Hans Kanyinga community forest. Harvesting of various forest products will be done as indicated below. All scientifically and culturally significant sites will be protected against any tree harvesting within and around. The only cultural site identified is the old graveyard and this will be protected against any tree harvesting within and around the graveyard, cleaning and fencing will be done.

It is important to note that the harvesting being discussed here refers to woody forest products. The harvesting of none wood products will be done randomly as needs arise. The harvesting of woody resources will be done on rotational basis and hence once the whole area has been covered, the cycle will start again.

Table 6 Harvesting blocks for Hans Kanyinga community forest

Area (Block)	Activity	Year
Likora layeshemb	Harvesting and other tending operations	2004
Katjire	Harvesting and other tending operations	2005
Kambyau	Harvesting and other tending operations	2006
Kumutya	Harvesting and other tending operations	2007
Madeghure	Harvesting and other tending operations	2008
Tolingi layeshemba	Harvesting and other tending operations	2009
Mungunga	Harvesting and other tending operations	2010
Tcumashi	Harvesting and other tending operations	2011
Mukuve	Harvesting and other tending operations	2012
Shanyumba Forest	Harvesting and other tending operations	2013

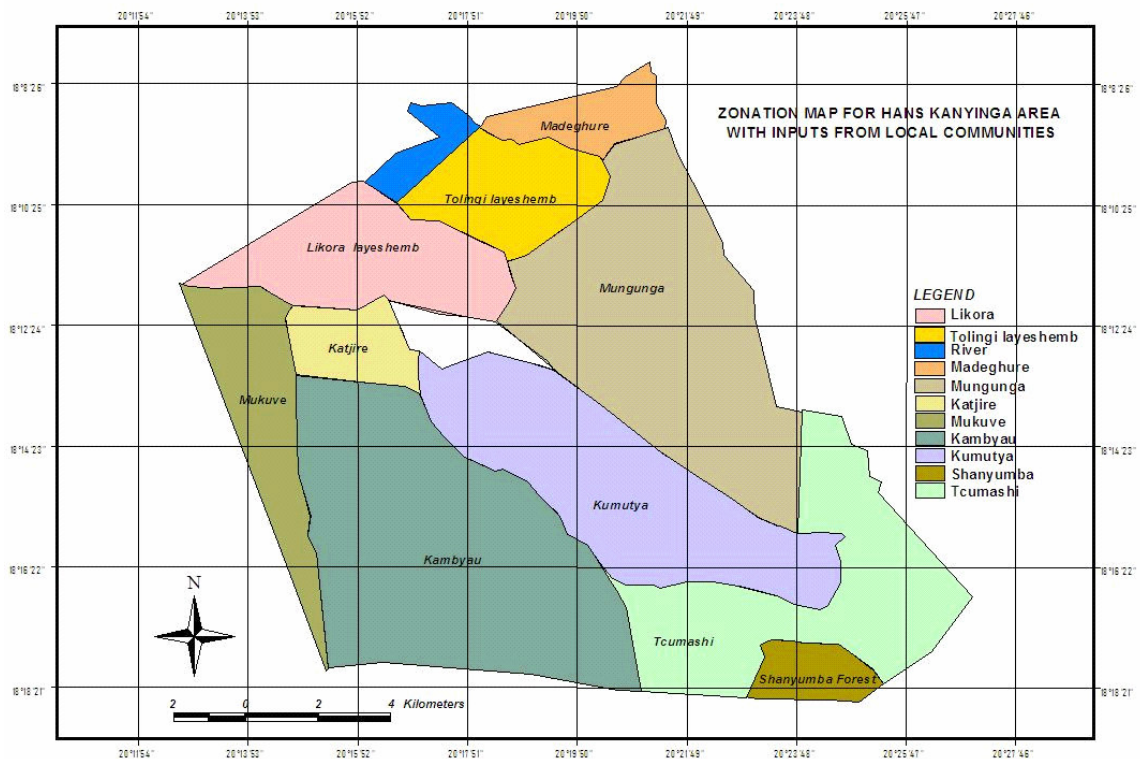


Figure 5 Management blocks for Hans Kanyinga Community Forest

8. Structural targets

The most important sources of livelihood for the community of Hans Kanyinga in order of importance are agriculture, livestock and forestry (Omoró, et al, 2003). The community of Hans Kanyinga relies chiefly on the forest for provision of poles and grass for grazing particularly during the dry season. Hence, it is important that pole quality be improved and grazing resource management is done. The resource is currently abundant. There are good opportunities to utilize them; however, no radical changes in the structure of the forest are desired by the community. The community wants to keep the forest well stocked in the future too.

In line with community's preferences for the utilization of forest resources, only 20% of the potential allowable cut of poles will be harvested; disappearing tree species will be re-introduced or protected and cultural sites preserved.

9. Forest management approach

The integrated forest management approach will be practiced, whereby all resources, livestock, cropping, forestry, grazing, woodlots and fire will be managed together. Appropriate silvicultural practices will be employed to improve the quality of poles which is the main products from the forest.

All types of silvicultural practices will be applied such as coppicing, pruning, selective harvesting, thinning and encouraging of regeneration.

Grazing system will be shifted to seasonal grazing systems and varied according to the seasons. The livestock number should be set according to availability of grazing resources.

Fire management will include construction of firebreaks in order to reduce incidences of fire occurrence in the forest. Fire suppression will be conducted whenever they occur and promotional activities to raise awareness levels of the community members.

10. Expected revenue estimates

The average price used in the calculation here for small sized pole is N\$ 7.00 and for a large size pole it is N\$ 10.00 (Cole, 2003). The total revenue of N\$ 34,000 (2,000 small-sized poles and 2,000 large-sized) poles might be expected from selling the poles during a normal year. Whether selling of the poles is financially feasible, depends on the cost of labor required for processing of poles, and hauling them to the markets. These costs calculation has not been included here.

11. Management prescriptions (schedule, timeframe)

Table 7 Proposed forest management activities year 2003

	Thatch-grass	Grazing management	Devil's claw	Poles	Fruits	Firewood	Timber	Crafts	Fire protection	Permit and patrols	Enrichment planting	HIV/Aids awareness
Jan		Control grazing inside the forest	Marketing		Collection/elling/ book keeping				Training	Issuing permits and carrying out patrols	Direct sowing	Awareness campaign
Feb		Control grazing inside the forest	Marketing		Collection/elling/ book keeping	Marketing	Marketing	Marketing	Training	As above	Direct sowing	As above
Mar	Finding buyers	Control grazing inside the forest	Harvesting	Marketing	As above	Marketing	As above	As above	Campaign	As above		As above
Apr	Finding buyers	Control grazing inside the forest	Processing	Marketing		Selling and book keeping	As above	As above	Cut lines construction	As above		
May	Finding buyers	Control grazing inside the forest	Marketing	Marketing		As above	As above	As above	Maintenance	As above		Community training
Jun	Selling	Control grazing inside the forest		Selling		As above	Selling	Selling	As above	As above		Drama (Aids)
Jul	Selling	Livestock grazed around mahangufields (uncontrolled grazing)		Selling		As above	As above	As above	As above	As above		Awareness campaign
Aug	Selling	Livestock grazed around mahangufields (uncontrolled grazing)		Selling	Marketing	As above	As above	As above	As above	As above	Seeds acquisition	Awareness campaign

Sep	Selling	Livestock grazed around mahangufields (uncontrolled grazing)		Selling	Marketing	As above	As above	As above	Campaign	As above	Seeds acquisition	Awareness campaign
Oct	Selling	Livestock grazed around mahangufields (uncontrolled grazing)		Selling	Collection/selling/ book keeping	As above	As above	As above	As above	As above		Awareness campaign
Nov	Selling	Livestock grazed around mahangufields (uncontrolled grazing)	Training		As above	As above	As above	As above	As above	As above	Direct sowing	As above
Dec		Livestock grazed around mahangufields (uncontrolled grazing)	Marketing		As above	As above	As above	As above	As above	As above	Direct sowing	As above

12. Implementation

Hans Kanyinga Community Forest Management Committee does not have immediate human capacity and material resources to carry out the envisaged activities in the management plan. It will definitely need technical support from Rundu Forestry Office. During each annual harvesting cycle, it is expected that Rundu Forestry Office to render technical advice in identification of harvesting blocks (coupes) and marking of trees. Rundu Forestry Office will also play a supervisory role to ensure that proper harvesting guidelines are followed in accordance with *Forest Act No 12 of 2001*.

The Forest Management Committee expects the Rundu Forestry Office to assist them with training to be able to mark and fell trees. About the haulage of products there are three options. They will use donkey cart to transport little quantities of poles from the forest. However, if the large amount of trees is felled for commercial sales, they will seek assistance from MET to haul their products to nearest access point. Alternatively, DoF staff advised the FMC that most of the saw-millers have capabilities to carry out the whole harvesting process until end-products are produced. The FMC is very skeptical to consider latter options because they fear that the buyers will pay them less money.

Finally, it is strongly recommended that a plan for implementation for each year be drafted together with Rundu Forestry Office. It is very important that tasks and responsibilities of all the stakeholders be clearly being specified in the plan. In the implementation plan there should also have been a schedule for each activity. The plan will be prepared on an annual basis so that the lessons learned in one year can be taken into account when planning for the activities of another year.

13. Collaboration

Hans Kanyinga Community Forest Management Committee needs technical advice as well as other services from the Rundu Forestry Office. They will require assistance in preparation of annual implementation plan until harvested products are marketed. However, the Committee emphasized that DoF staff will only play advisory and supervisory role. The Forest Management Committee will be entirely responsible for the actual implementation of activities on the ground.

14. Monitoring

The Forest Management Committee assisted by the Rundu Forestry Office staff will carry out monitoring of the implementation. The monitoring will include at least following field based activities;

- Whether there is practically activities happening on the ground such as identifying areas for harvesting of timber and poles.
- Marking of correct trees and prescribed distances to be kept between the trees.

- Marketing strategies are carried out to attract timber buyers through media or other methods (publicity).
- Record keeping for all activities occurring in the community forests.
- Monitoring of any changes in the forest (illegal harvesting, damages by fires, wildlife, pests, etc.) to be done by FMCs and Honorary Foresters when patrolling the community forests.

15. Event book

Every activity taking place during the course of the year will be recorded and this will help to keep track of all events/transactions which have occurred. The table below shows different activities and items to be recorded;

Table 8. Event book for Hans Kanyinga Community Forest monitoring

Events	Items
Firewood	Cubic meters/tons harvested
	N\$ sold
	Stock in cubic meters/tons
Thatching-grass	Cubic meters/bundles harvested
	N\$ sold
	Stock in cubic meter/bundles
Seedling production	Number of seedlings produced
	Number of seedlings sold
	Number of seedlings planted
	Number of remaining stock after planting
Grazing	Area grazed
	Period of grazing
	Number of animals
Training	Number of people trained
	Field of training given
Deadwood	Number of trees harvested and species
	Number of articles of crafts made
	Amount of money generated from the craft articles
	Number of items in stock
Fire campaign	Number of meetings held
	Number of people attending
	Media used
	Age class and gender attending meetings
HIV/AIDS campaign	Number of meetings held
	Media used
	Number of people attending the meeting
	Age class and gender attending meetings
	Number of condoms distributed

(Source: Omoro *et al.*, 2003)

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Annex 1. Diameter distribution of the total number of stems by species for live trees.

Species/Diameter Class	5-15	15-25	25-35	35-45	45-55	55-65	> 65	Total	% of total
<i>Acacia erioloba</i>	2.64	1.32	0.33		0.15			4.43	0.2
<i>Acacia nebrownii</i>	3.95	1.65	1.32	0.99	0.29			8.20	0.4
<i>Acacia tortillas</i>			0.33					0.33	0.0
<i>Boscia albitrunca</i>		0.33						0.33	0.0
<i>Burkea Africana</i>	9.23	1.32	1.32	1.98	0.59	0.15	1.00	14.87	0.7
<i>Colophospermum mopane</i>	1310.26	342.39	76.78	32.30	12.38	4.69	5.00	1783.62	81.7
<i>Combretum apiculatum</i>	2.64	1.65	0.33					4.61	0.2
<i>Combretum collinum</i>	18.45	5.27	3.95	0.66				28.34	1.3
<i>Combretum imberbe</i>	23.73	7.58	0.66	0.33				32.30	1.5
<i>Combretum molle</i>	3.95		0.33					4.28	0.2
<i>Commiphora angolensis</i>	1.32		0.33					1.65	0.1
<i>Diallum engleranum</i>	6.59							6.59	0.3
<i>Diospyros mespiliformis</i>				0.99	0.15	0.15	1.00	1.57	0.1
<i>Erythrophleum africanum</i>	2.64		0.66	1.98	0.15			5.42	0.2
<i>Fiadherbia albida</i>	3.95	0.33						4.28	0.2
<i>Lonchocarpus capassa</i>	9.23	7.58	5.60	1.98	0.29	0.15		24.83	1.1
<i>Lonchocarpus nelsii</i>			0.99					0.99	0.0
<i>Manilkara mochicia</i>	3.95	1.32	0.66	0.66		0.15	0.15	6.88	0.3
<i>Ochna pulchra</i>		0.33						0.33	0.0
<i>Peltophorum africanum</i>	15.82	0.33	0.99	0.33	0.15		0.15	17.61	0.8
<i>Piliostigma thonningii</i>						0.15		0.15	0.0
<i>Sclerocarya birrea</i>	3.95		0.33			0.29	0.15	4.72	0.2
<i>Terminalia sericea</i>	90.95	58.66	33.61	6.92	1.61	0.88	0.15	192.78	8.8
Unknown		1.32						1.32	0.1
<i>Ximenia Americana</i>	26.36	5.60	0.33					32.30	1.5
Total	1539.62	436.97	128.9	49.10	15.74	6.59	6.00	2182.73	