



Kilosa District Harvesting Plan

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FOREWORD

A new Kilosa District Harvesting Plan has been developed in 2015.

The objectives of this harvesting plan include:

- promoting ecologically sustainable harvesting of forest products including timber, fuel wood and charcoal
- promoting good governance including transparency, accountability, participation, equitable benefit sharing, and promoting free, prior and informed consent for communities
- and promoting revenue generation from sustainable harvesting of timber and charcoal for local government including the villages

The methods used to calculate sustainable harvesting limits are more scientifically rigorous than previous approaches and involve a combination of ground surveys and remote sensing. The plan is not only the first of its kind in Kilosa District but also in the whole of Tanzania. The scope of this harvesting plan focuses on procedures for harvesting timber and charcoal in un-reserved forests on village land, municipalities, and Local Authority Forest Reserves in Kilosa.

This plan is also intended to contribute to the development of national guidelines on the development of district harvesting plans that integrate timber and charcoal.

The plan includes detailed descriptions of how it should be implemented, particularly with regards to how the district should work with villages and includes estimates of sustainable harvesting broken down by village.

The harvesting plan was developed by a team of consultants which included representatives from the Forestry and Beekeeping Division, Tanzania Forest Services, Kilosa District Council and Sokoine University of Agriculture. The assignment was part of the activities of the project: Transforming Tanzania's Charcoal Sector, which is funded by Swiss Agency for Development and Cooperation.

In Kilosa, as in any other parts of the Tanzania, people depend on forests and woodlands either directly or indirectly. Forests and woodlands are essential for providing a wide range of products such as timber, charcoal and woodfuel. They also provide a wide range of environmental services such as water catchment, biodiversity, clean air and ecotourism. Forests and woodlands are an important source of income and employment.

However, the woodland management in Kilosa is facing challenges. Most of the un-reserved woodland resources in the village lands are being harvested without the presence of harvesting plans. This leads to widespread deforestation and woodland degradation in the district. The presence of this harvesting plan in Kilosa will help in addressing the challenge.

District stakeholders, especially the districts villages, will benefit from this harvesting plan and hopefully other districts in the country will learn from this experience and develop their plans on sustainable harvesting for timber and charcoal. This will be an important step towards starting to curb widespread deforestation and forest degradation of un-reserved forests on village lands throughout the country.

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This assignment of developing the Kilosa District Harvesting Plan was commissioned to the Team by the Tanzania Forest Conservation Group (TFCG). The assignment is part of the Transforming Tanzania's Charcoal Sector Project implemented by the Tanzania Forest Conservation Group (TFCG) in partnership with the Tanzanian Community Forest Conservation Network (MJUMITA), and the Tanzania Traditional Energy and Development Organisation (TaTEDO) with financial support from the Swiss Agency for Development and Cooperation. The team wish to extend their votes of thanks to TFCG for the trust to undertake this important and challenging assignment.

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Village leaders and villagers of Maguha, Magubike, Makwambe and Unone who participated actively in the discussions during our visits to their villages are highly appreciated.

EXECUTIVE SUMMARY

Introduction

Background Information

Kilosa District is located in east central Tanzania, about 148 km from Morogoro town. Kilosa extends between latitude 5°55' and 7°53' South and longitudes 36°30' and 37°30' East. The District covers 12,394 square kilometers; is divided into 35 wards and 118 registered villages with 752 hamlets; has two parliamentary constituencies and two township authorities (Kilosa and Mikumi). Kilosa District has a population of 438,175 people. Kilosa District is endowed with both natural forests and woodlands. Woodlands and forest cover about 40% of the total land area. Dominant tree species in the woodlands are *Brachystegia bohemii*, *Brachystegia spiciformis*, *Brachystegia microphylla*, *Commiphora spp*, *Combretum spp* and *Albizia spp*. The current coverage of central government forest reserves is about 97,700 ha managed by the Tanzania Forest Services. District Council Forest Reserves cover an area of 24,654 ha (Magubike South – 15,055 ha and Magubike North – 9,599 ha). Mikumi National Park overlaps with about 212,500 ha of the district. The area under Village Land Forest Reserves is about 124,335 ha.

Based on remote sensing, the total forest area of Kilosa District in 2014 was 503,727 ha¹. This includes 110,056 ha in Mikumi National Park, 8,168 ha in district council forest reserves, 66,517 ha in national forest reserves, 88,879 ha in village land forest reserves, 21,375 ha in Kilosa and Mikumi township sub-villages, and about 208,732 ha on unreserved village land. The areas of forest reserves are smaller than reported because some forest reserves and protected areas include natural non-forest areas such as grasslands or as in the case of parts of the district council forest reserves, have been converted to agriculture.

By forest type, the district has 35,442 ha of sub-montane forest, almost entirely in protective national government and village land forest reserves, 424,172 of woodland, and 44,112 ha of *Commiphora* dominated thicket/woodland. Forests in the Rubeho Mountains and Ukaguru Mountains in Kilosa District are part of the Eastern Arc Mountains, a globally important biodiversity hotspot. Natural forests are the source of most of Kilosa Districts major rivers.

The Harvesting Plan

The objectives and Scope of the Harvesting Plan

The objectives of the district harvesting plan include:

- promoting ecologically sustainable harvesting of forest products including timber, fuel wood and charcoal;
- promoting good governance including transparency, accountability and participation;
- promoting equitable benefit sharing;
- promoting free, prior and informed consent for communities; and
- revenue generation for local government.

The scope of this Harvesting Plan focuses on harvesting timber and charcoal in un-reserved forests on village lands and local authority Forest Reserves of Kilosa District. The harvesting plan stipulates the following:

¹This estimate does not include any young regenerating forests that have started to grow in the past 15 years.

- Roles and responsibilities of different stakeholders including of the District Harvesting Committee, LGAs, TFS, Village leaders and others.
- Procedures to be followed by those requesting permission to harvest to ensure transparency and the free, prior and informed consent of the communities on whose land harvesting is proposed.
- Permits to be issued to those requesting permission to harvest.
- Procedures for identifying the trees to be harvested and mechanisms to ensure compliance.
- Schedule of fees to be paid by those requesting permission to harvest.
- Schedule of fees to be paid to the villages from whose land timber is harvested; and those to be retained by the District.
- Procedures for the district to channel revenues to the affected villages.
- Procedures for seeking and documenting consent from communities with forests covered by the plan.
- Guidelines clarifying that harvesting within village forest reserves will be covered by the respective VLFR management plans.
- Procedures to adjust the plan when communities include their village forest in village land forest reserves.
- Monitoring and reporting procedures and responsibilities.
- Strategies to ensure enforcement of the plan and procedures for addressing those who contravene the plan.
- Communication and visibility of the plan.

Criteria for a Forest to be harvested

In order for unreserved village land forests or local authority forest reserves to be eligible for harvesting, different requirements need to be fulfilled. Therefore the proposed criteria range from procedural to ecological aspects. Generally these include:

- Forest assessment – a current assessment of harvestable stock should be available
- Forest harvesting plan – a current village harvesting plan that has been approved by the respective village assembly should be available
- Status of forest condition
- Approval of the village – the village must have approved the harvesting plan and by-laws
- By-laws – village by-laws governing harvesting must be in place

Application Procedures

Harvesting of timber and charcoal in un-reserved forests on village land and local authority forest reserves follow different application procedures.

Unreserved forests on village land

- The Village Assembly must have approved a proposal to permit harvesting in the unreserved forests on village land. Permits shall only be issued in villages where the Village Assembly has approved harvesting.
- The forest dealer identifies the forest and village from which timber is to be harvested.
- The Forest dealer submits an application letter to the respective Village Council addressed to the Village Executive Officer.
- The application letter is reviewed and approved by the Village Council and Village Environmental Committee (if existing) who will compare the request with the available harvesting quota as stipulated in the Village Harvesting Plan and taking prior harvesting into consideration.
- The applicant fills a special application form (TFS 1).

- The relevant section in TFS.1 will be filled by the Village Executive Officer.
- Minutes documenting the approval of the request by the village council are attached with the special application form (TFS 1) and are submitted to the District Forest Office for registration.
- The DFO will submit the registered application forms (TFS.1) together with the District Harvesting Plan to the District Harvesting Committee for decision making.
- The applications are discussed by the District Harvesting Committee on a quarterly basis.
- Based on the Committee's recommendations, the DFO will issue a license to the applicant, after paying relevant fees.

Local Authority Forest Reserves

- The DFO submits a proposal for harvesting from a Local Authority Forest Reserve to the DNRO who presents the proposal to the District Council Management Team (CMT) for discussion. After being discussed by the CMT, the proposal is taken to the District Environmental Committee for approval prior to be approved by the District's Full Council meeting.
- After being approved by the Full Council Meeting, the tender for harvesting in the Local Authority Forest Reserve(s) is announced / advertised by the DED
- Applicants submit their applications to the District Council Tender Board.
- District Council Tender Board processes the applications and award.
- District Council is informed of the District Council Tender Board decisions
- The District Harvesting Committee is informed for final decision making

Notwithstanding the above procedure, the current condition of the Local Authority Forest Reserves of Kilosa District does not allow harvesting.

District Harvesting Committee

The current composition of the District Harvesting Committee is as follows:

Regional Natural Resources Officer	Chairperson
District Administration Secretary	Member
District Forest Manager (DFM)	Secretary
District Land and Natural Resources Officer	Member
District Forest Officer	Member
Village Executive Officer of the village owning the forest	Member
Village Chairperson of the village owning the forest	Member

Permit and License Procedures

Permit and license procedures for harvesting forest products in un-reserved forests on village land and local authority forest reserves are guided by the National Harvesting Guidelines of 2015 and Forest Act of 2002. The key sections in the Forest Act regarding permit and license procedures include Sections 49, 50, 54 and 55.

Jurisdictions and area of Operation of the Plan

This Plan will operate in Kilosa District. The areas of jurisdiction are: (1) Un-Reserved Forests on Village Land and (ii) Local Authority Forest Reserves (Magubike South 15,055 ha and Magubike North 9,599 ha).

Roles and Responsibilities

The key stakeholders in the Harvesting Plan are the District Forest Officer (DFO), District Land and Natural Resource Officer (DLNRO), District Economic, Works and Environmental Committee, Full Council Meeting, District Harvesting Committee, Village Chairpersons of the villages where

harvesting is planned and the Customer. The key actors have different roles and responsibilities in the Harvesting Plan that are detailed in the document.

Actual felling Operation

A harvesting cycle of 50 years for timber shall be used to determine the volume of wood that can be harvested annually. The harvesting cycle of 50 years for timber is used in this plan because the harvested areas will be managed by Village Natural Resource Committees to protect those areas against wildfires, grazing and shifting cultivation. This will also provide enough time and conducive environment for the un-harvested small trees to reach harvestable size. Felling will be supervised by the District Forest Manager (DFM) together with the Village Council (represented by the Village Natural Resources Committee) and trees to be felled will be marked. After felling, marking of logs and stumps by the DFM using FD hammer will be done.

Regarding charcoal harvesting the following shall be taken into consideration:

- Timber species (except *Brachystegia* spp) shall not be harvested for charcoal, except branches left during timber harvesting and timber trees with poor quality (e.g. rotten, crooked and burnt by fire).
- Charcoal production should use efficient technologies (e.g. half-orange, IBEK or Casamanse Kiln) as provided in the National Harvesting Guidelines of 2015.
- Reserved tree species shall not be used for charcoal making.
- Trees for charcoal production will be harvested selectively as defined in Section 1.9.3.
- Remains of the trees harvested for timber will be used for charcoal making. Charcoal made from timber harvesting off-cuts will only be produced by those with permits to produce charcoal and who have been trained in sustainable charcoal production.

Forest potential and harvesting operations in un-reserved forests on village lands

Kilosa District is estimated to have an area of 162,541 ha woodlands suitable for timber harvesting and 158,206 ha of woodlands and thicket suitable for charcoal harvesting on unreserved village land and municipal sub-villages. The potential harvestable volume in a village will be divided to determine annual harvesting quotas. A rotation cycle of 50 years for timber and 90 years for charcoal shall be used to determine annual volume quotas. Note that the rotation for timber is shorter because potentially harvestable timber volume is calculated only from trees already above the legal minimum diameter for harvesting (LMDH) and they are assumed to already be at least 50 years old. Charcoal harvesting includes trees which are much smaller (assumed starting age of at least 10 years) and thus a longer period is required to replace the existing stock, which also includes very old trees. Since very large trees are not required for charcoal production, a shorter rotation could be used (e.g. 24 years) to capitalize on the faster growth of younger trees, but since the unreserved forests on village land are not under any management, it is more appropriate to use a longer rotation. Also, with a 90 year rotation, the effective seed to harvest rotation for charcoal is the same as for timber – 100 years.

The template for timber and charcoal species available, harvestable stock and what can be annually harvested sustainably for timber and charcoal has been prepared and presented in the document.

Timber harvesting operations in un-reserved forests on village land

Timber harvesting in un-reserved forests on village land will be carried out in areas designated for harvesting by villages. Trees that will be harvested shall be identified and marked e.g. by paint and volume estimated after which the customer will be allowed to make preliminary payments. Harvesting will then start by felling the tree, cross-cut into logs. The logs and stumps will be marked

using FD Hammer by DFM. Logs will be processed into timber/ sleepers and the volume measured or taken as logs.

Charcoal harvesting operations in the un-reserved forests on village land

Charcoal production will be done in the same areas that were designated for harvesting by villages after timber harvesting. Also, charcoal production on a limited scale can be directed to trees felled during new agricultural plots preparation in areas set by the village for agriculture. This will not be selective harvesting, but charcoal making using trees felled during new agricultural plots preparation will be done in accordance with the District Harvesting Plan. This will reduce demand for cutting trees from non-farming areas.

Forest development and governance

Compliance to relevant laws, policies and regulations

In order to ensure sustainable supply of forest products such as timber and charcoal the Government has put in place several policies, laws, regulations and guidelines that must be complied with.

Regarding timber and charcoal harvesting important provisions of the Forest Act of 2002 are provided in the harvesting plan.

The District authority shall identify and set selling centres for charcoal. The charcoal selling centers proposed include: Morogoro - Mikumi road (charcoal selling centers to be at Msimba and Doma), Morogoro-Dodoma road (charcoal selling centers to be at Maguha, Berega and Kiyegeya). More charcoal selling centres can be identified.

Natural Regeneration

The potential for woodland to produce charcoal and timber sustainably mainly hinges on the ability of the woody species to regenerate and grow.

The plan encourages natural regeneration. Literature shows that the most efficient way to restore vegetative cover in miombo is to protect it from excessive grazing, wildfires and agriculture expansion. On the other hand, enrichment planting of trees in degraded areas would speed up the process. On the overall, in order to ensure effective regeneration in the timber and charcoal producing areas, the following need to be taken into consideration:

- Ensure that the seed-producing trees are left uncut to facilitate adequate regeneration. The harvesting of charcoal and timber should ensure maintenance of adequate stocks of seed-bearing trees.
- Ensure that seedlings are not damaged during timber and charcoal harvesting.
- Disused paths and tracks should be closed so that regeneration of secondary vegetation occurs.
- Enrichment planting may be done in harvested areas using indigenous species that will not change the vegetation composition.

Wildfires are controlled and fire management is implemented to ensure maximum natural regeneration.

- Natural regeneration in the harvested areas should be protected against grazing, wildfires, shifting cultivation through by-laws and regular patrols. Dense grass cover can inhibit regeneration through competition for resources and by providing fuel for hot fires. Therefore, low-intensity grazing of cattle to reduce grass cover may be beneficial in some circumstance. However, grazing of

goats and other livestock should not be allowed in harvested areas as they will eat regenerating trees.

Tree Planting

Currently, Kilosa District Council is required to plant 2,000,000 tree seedlings annually. At present tree seedling production for tree planting activities is done by various institutions in the District. The main objective of tree planting is to supplement trees cut for timber and charcoal making from the natural forests. The annual plan for each institution starting from the year 2015/16 is given in the document. However, in-order for tree planting to be effective, the planted trees must be tended and protected to ensure survival.

Ecological sustainable harvesting

Charcoal and timber production requires protecting the ecology of the forest. That means the activities should have minimum impacts to water sources, biodiversity, wildlife and the entire ecosystem functions. Some of the conditions that will ensure ecological sustainable harvesting are:

- Harvesting methods that do not impair the original structure and diversity of the forest should be promoted.
- Harvesting methods should minimize impacts on the biological, chemical and physical characteristics of the soil.
- A map showing the protected sites within the harvesting areas should be available for effective monitoring of the ecological sustainability of harvesting.
- Protection of sites of religious, historical, cultural or particular socio-economic value should be ensured.
- The clearing of forests for farming (e.g. in Unone village) and related agricultural activities in the District should be regulated through by-laws.
- Post-harvest species composition and density of undergrowth do not show increased abundance of populations of invasive species.
- Sensitive areas as defined in the Environmental Management Act (EMA) of 2004 should be identified and selected through ecological surveys and included in the protected sites in the harvesting areas.
- Ensure that standardized data on fauna and flora are available for effective ecological monitoring.
- Selective harvesting should be used for timber instead of clear felling so as to ensure ecological sustainability. Regarding felling trees for charcoal production, harvesting in patches (similar to those already being used in the sustainable charcoal project in Kilosa District) should be used to ensure that the size of clearings remain small and dispersed.
- Ensured that diversity and relative abundance of fauna species do not change significantly.

Exhaustive list of the requirements guiding ecological sustainability are stipulated in the Environmental Management Act of 2004, therefore apart from the District by-laws and village by-laws it is very important to adhere to the Environmental Management Act together with the sectoral regulations.

Governance and Control

To enhance good governance and control the Harvesting Plan proposes that:

- Relevant staff at district (including DED, DLNRO, DFO and DFM) and village levels (Village Natural Resource Committee Members, Village Chairpersons and Village Executive Officers) deal with forest harvesting in un-reserved forests on village lands and local authority forest reserves shall be trained on the elements of good governance (e.g. democracy, civil rights, transparency, and

the rule of law, accountability, efficient public services delivery, conflict mediation, budgetary and financial management, revenue mobilization and public expenditures).

- all activities being implemented in a gender sensitive manner, ensure free, prior and informed consent (FPIC) principles, and attention is paid to the cultural, educational and resource constraints that women may have.

Royalties, Fees and Benefit sharing

Every harvesting permit should specify fees, royalties and other charges that must be paid in accordance with the law. The DFO/DFM has a duty to collect all revenue from fees, royalties and licenses charged. Royalties for timber are paid according to timber classes.

In addition, the timber, charcoal and commercial firewood harvesters are required to pay 5% of the royalty paid as a contribution to tree planting. This amount is currently administered by Tanzania Forest Fund. Other fees are payable on services such as transit pass and registration.

Local government authorities such as District Councils and villages have powers to formulate their own by-Laws within their area of jurisdiction. Therefore, Kilosa District Council and Village Councils can collect cess and fees respectively. The by-laws shall stipulate fees that can be collected on the forest products harvested from their areas of jurisdictions. The Kilosa District Council by-Law of 2015 provides for collection of Cess from forest produce.

Unfortunately, most of the village councils are yet to formulate and approve by-laws that stipulate fees for the forest products such as timber and charcoal harvested from un-reserved forests on village lands within their areas of jurisdictions. Village councils are advised to formulate their by-laws that will allow them to charge fees on forest products from un-reserved forests on village lands of their jurisdictions.

Benefit Sharing

Benefit sharing in this Harvesting Plan can be improved through the following approaches:

- Regarding un-reserved forests on village lands, Village Councils should formulate by-laws to enable gaining benefits from timber and charcoal harvesting.
- On District Council Forest Reserves, the Council should enter into Joint Forest Management Agreement with adjacent villages to facilitate sharing of benefits in line with the Joint Forest Management Guidelines of 2013.

Revenue generation for local government

The Local Government Finances Act makes reference to Section 10 of the Forest Act and allows the District Council to collect revenues derived from fees for forest produce and licenses into the general fund of the Council therefore may not necessarily be available to the forest activities in the District.

The sources of revenues of Village Councils are also provided in the Local Government Finances Act. The sources mainly include all moneys derived from licenses, permits, dues, fees, charges or tariffs specified in the by-laws made by the Village Councils. The Act allows Village Councils to formulate by-laws that prescribe reasonable fees, charges and tariffs for any license or permit issued by the Village Council.

Promotion of free, prior and informed consent for communities

For the purposes of the District Harvesting Plan, the underlying principles of free, prior and informed consent can be summarized to include: (i) Information and consultation on preparation and implementation on the Harvesting Plan; (ii) participation of communities on preparation and implementation on the Harvesting Plan and, (iii) representation of communities to the harvesting committees.

Communities need to be given an opportunity to build/strengthen their individual and collective capabilities in order to take advantages of available opportunities.

Coordination at District and National Level

In order to coordinate the harvesting plan, control illegal harvesting, improve revenue collection and law enforcement the following will be done:

- Increase information sharing and communication
- Increase participation in decision making and implementation of the Plan
- Use of existing network
- Promote joint patrol between stakeholders
- Increase regular feedback meeting
- Charcoal producer associations will be promoted

MONITORING AND EVALUATION AND ADJUSTMENT OF THE PLAN

Frequent joint forest patrols involving different stakeholders from the district to the village level specifically Village Natural Resource Committees have to be conducted regularly to ensure harvesting activities comply with district harvesting plan. The DFO is responsible for preparing monthly, quarterly and annual reports showing the amount of tree volume harvested and forest royalties collected. The District Forest Harvesting Committees have to conduct meetings every four months to discuss the harvesting trend as required by the guidelines.

RECOMMENDATIONS

The following are key recommendations:

- The Kilosa District Councils should urgently review the management objectives for Magubike South and Magubike North Forest Reserves, and prepare new management plans.
- The two District Council Forest Reserves (Magubike North and South) can be managed efficiently if Joint forest Management is introduced.
- The harvesting plan should be valid for 5 years and should be reviewed with updated information on forest areas and timber and charcoal stocks at that point.
- Kilosa District Council should ensure that harvesting in un-reserved forests on village lands is done according to the Harvesting Plan, and customers should comply with the Plan.
- District Council should increase awareness to villages on Community Based Forest Management so as to declare more forest into village land forest reserves.
- The District should identify areas to be used as charcoal selling centers and establish them. Charcoal producers and traders should be encouraged to form associations.
- The Kilosa District Council and TFS should enhance their capacity to implement Harvesting Plan.
- Villages should develop By-Laws to enable the villages to benefit from the timber and charcoal harvesting activities within their areas of jurisdictions.

LIST OF ACRONYMS / ABBREVIATIONS

CMT	Council Management Team
DED	District Executive Director
DFM	District Forest Manager
DFO	District Forest Officer
DHC	District Harvesting Committee
DNRO	District Natural Resource Officer
EIA	Environmental Impact Assessment
EMA	Environmental Management Act
FD	Forestry Division
FPIC	Free Prior Informed Consent
GN	Government Notice
IBEK	Improved Based Earth Kiln
KDC	Kilosa District Council
LAFR	Local Authority Forest Reserve
LGAs	Local Government Authority
MNRT	Ministry of Natural Resource and Tourism
PFM	Participatory Forest Management
PMO-RALG	Prime Minister Office- Regional Administration and Local Government
TFS	Tanzania Forest Services Agency
TFCG	Tanzania Forest Conservation Group
TP	Transit Pass
REDD	Reducing Emissions from Deforestation and forest Degradation
VEO	Village Executive Officer
VLFR	Village Land Forest Reserve
WWF	World Wide Fund for Nature

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1) INTRODUCTION

1.1 Background Information of The District

Kilosa District Council is one of seven District Councils in Morogoro Region. Other districts include Kilombero, Mvomero, Morogoro Urban, Morogoro Rural, Ulanga and Gairo. It is located in east central Tanzania, about 148 km from Morogoro town and 300 km west of Dar es Salaam. Kilosa extends between Latitude 5°55' and 7°53' South and Longitudes 36°30' and 37°30' East. Kilosa District is bordered with Gairo District on the North, Mvomero District to the East, Kilombero and Kilolo (in Iringa Region) Districts to the South, Mpwapwa District (in Dodoma Region) to the West and Kongwa District (in Dodoma Region) to the South West (Figure 1).

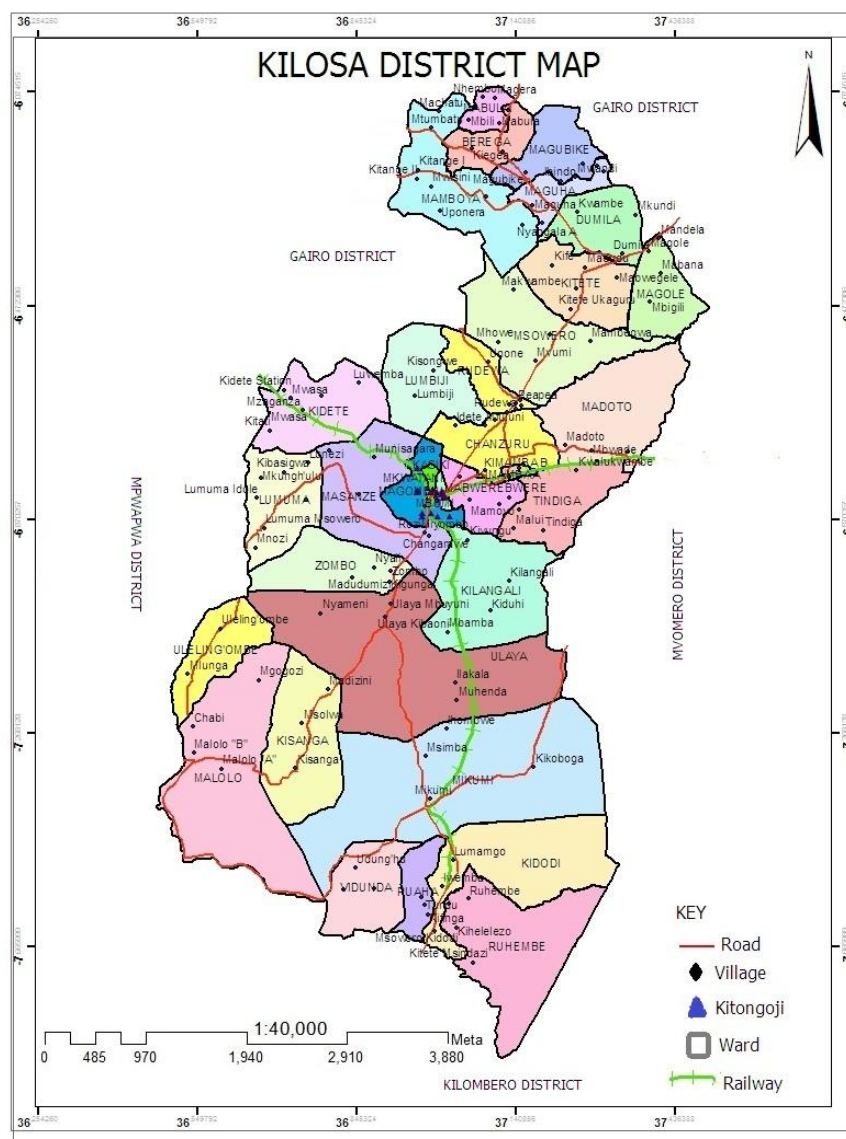


Figure 1: Map of Kilosa District

The name Kilosa originated from Chilosa which Germans failed to pronounce correctly. Before Gairo District was split from Kilosa District, the former District had an area of 14,245 km² (KDC, 2007). Areas of different wards in Kilosa District are documented in KDC (2012). Estimates of areas of the wards in current Kilosa District are shown in Table 1. Implicitly, the current Kilosa District is

estimated to have land area of 12,394 km² (Table 1). It is estimated that 536,590 hectares of the district is arable land. Distribution of total land area by ward is given in Table 1. The largest ward is Mikumi covering 10.6% of the total area of the district. Kilosa District is divided into 35 wards and 118 registered villages with 752 hamlets. The District has two parliamentary constituencies namely Kilosa and Mikumi. The District has two township authorities which are Kilosa and Mikumi Township. Mamboya Ward has the highest number of villages and hamlets with 10 villages and 62 sub-villages, respectively.

Table 1. Land Area by Ward in Kilosa District, 2012

Ward name	Land area in km ²	% of Total District
Dumila	234.8	1.9
Kitete	317	2.6
Magole	224.1	1.8
Msowero	554.1	4.5
Berega	140.1	1.1
Mbula	89	0.7
Magubike	126.5	1.0
Maguha	209	1.7
Mamboya	506.5	4.1
Mkwatani	17.5	0.1
Magomeni	638	5.1
Kasiki	14.6	0.1
Mbumi	3.4	0.03
Lumbiji	326.4	2.6
KimambaA'A'	12.6	0.1
Kimamba 'B'	9.8	0.1
Chanzuru	447.3	3.6
Madoto	324	2.6
Rudewa	147.5	1.2
Lumuma	316.6	2.6
Kidete	379.9	3.1
Kilangali	504	4.1
Masanze	471	3.8
Mabwerebwere	203	1.6
Tindiga	238	1.9
Mikumi	1314	10.6
Ruhembe	607	4.9
Kidodi	456	3.7
Ruaha	229	1.8
Ulaling'ombe	247	1.9
Vidunda	276	2.2
Malolo	883	7.1
Kisanga	451	3.6
Ulaya	1178	9.5
Zombo	298	2.4
Total	12,394	100.0

Source: Kilosa District Council Office, 2012

1.2 Climate

Rainfall distribution in the District is bi-modal with 'short rains' starting in November and ending in January, and 'long rains' starting in March and ending in May with a peak in April. The average annual rainfall varies from year to year and between ecological zones. Average annual rainfall ranges from 1,000 mm to 1,400 mm for the Southern flood plains and ranges from 800 mm to 1,100 mm for the Northern part of the District. Mountain forest areas can receive up to 1,600 mm annually. Temperature in the district varies with altitude. Average annual temperature in the district is 25°C with coldest month being July (19°C) and hottest month being March (30°C).

1.3 Topography and Agro Ecological Zones

Topography within the district is variable. The central and southern flood plains of the Wami, Mkata and Ruaha rivers are at 400 m in elevation. The highest parts of the district are found in the Ukaguru, Rubeho and Vidunda mountains, which form an almost continuous north-south spine along the western side of the district and reach an elevation of 2200 m. There are three main agro-ecological zones which support a variety of crops. Characteristics of these ecological zones and crops they support are summarized in Annex 1.

1.4 Population Size and Growth

According to the 2012 population census, Kilosa District has a population of 438,175 people. Data indicate Kilosa District accounts for 19.8% of the total population of Morogoro Region. Annex 2 shows distribution of population by ward and sex based on 2012 census.

1.5 District Economy

The District is endowed with great potential for economic development and prosperity. The District has a very good climate and arable land favorable for agriculture. Generally agriculture has continued to dominate the livelihood and economy of the district. Besides farming, livestock keeping, trade, fishing and tourism play a significant role in the district economy. Given the diversity of ecological zones in the district, a wide range of crops are grown in the area. These include maize, paddy rice, sorghum and millet, beans, coffee, bananas, sunflower, cotton, soya beans, sesame, onions, cabbages, tomatoes, egg plants, carrots, peppers, sugarcane, sisal, mangoes, oranges and lemons. Most farmers own small farms with an average of 0.8 ha. Crop yields in these farms are generally low caused by poor methods of farming employed by farmers. Most farmers produce at subsistence level and depend on rain-fed agriculture. Irrigation is practiced in a few areas such as Lumuma with crops under irrigation being mainly horticultural crops such as onions. There were 200,000 cattle, 100,000 goats, 40,000 sheep, 10,000 pigs and 750,000 chickens in the District in the year 2011 (KDC, 2012), and the number increased substantially between 2009 and 2011. Contribution of forestry is covered in subsequent sections.

1.6 Forest Coverage

Kilosa District is also endowed with both natural forests and woodlands. Natural forests constitute 6.3% which are found in the higher parts of the District (1,400 – 2,200 m.a.s.l), where there is higher rainfall. Most natural forests are protected as forest reserves. These forests are ecologically important for biodiversity as they provide a wide variety of habitat for many species of mammals, birds and insects. Forests in the Rubeho Mountains and Ukaguru Mountains in Kilosa District are part of the Eastern Arc Mountains, a globally important biodiversity hotspot. Kilosa District forests have populations of at least three mammal species classified as Endangered by IUCN: Abbott's

duiker, Howell's forest shrew and Kihale's Mouse Shrew. Kilosa's forests and woodlands also provide important habitat and migration corridors for elephants. Also natural forests are the source of most of the rivers in the District. A combination of these functions provides the basis for protecting them as forest reserves.

Woodlands cover about 40% of the total land area in the District (KDC, 2012). Most of these woodlands are situated on hilly areas. Human activities in dense woodlands have overtime resulted into open woodland and woodland with scattered crops. As a result dense woodlands are situated far from settlements. Woodlands with scattered crop land borders the cultivated land and may be considered as a frontier to the expanding agriculture. Building materials, fuelwood and charcoal are extracted from either open woodlands or woodland with scattered crop land. Woodlands are important for the socio-economic development of the District. They provide timber, energy and honey for the population in the District. Many communities also collect medicinal plants, mushrooms, fruits, tubers and fodder from woodlands and forests. Dominant tree species in the woodlands are *Brachystegia microphylla*, *Brachystegia bohemii*, *Brachystegia spiciformis*, *Commiphora spp*, *Combretum spp* and *Albizia spp* (Shishira *et al.* 1997).

These forests and woodlands are mostly found in the western part of the District, and include forest reserves, un-reserved forests on village lands, and community forests. Before Gairo District was created, the central government forest reserves covered an area of about 106,983 ha. The current coverage is about 97,700 ha managed by the Tanzania Forest Service Agency.

District Council Forest Reserves cover an area of 24,654 ha (Magubike South – 15,055 ha and Magubike North – 9,599 ha). The area under Village Land Forest Reserves is about 124,335 ha. The area under un-reserved forests on village lands is 208,732 ha. Annex 7 provides a list of all forest reserves in Kilosa District.

Table 2: Protected Area Status in Kilosa District

Forest type	Area
Forest reserve under Local Government	24,654
Forest reserve under Central Government	97,700
National Park/Game reserve (overlapping with district)	212,500
Village Forest Reserves	124,335
Total protected areas	459,189

Source: compiled from Shishira *et al.* (1997); KDC (2012)

Based on remote sensing, the total forest area of Kilosa District in 2014 was 503,727 ha². This includes 110,056 ha in national parks, 8,168 ha in district council forest reserves, 66,517 ha in national forest reserves, 88,879 ha in village land forest reserves, 21,375 ha in Kilosa and Mikumi township sub-villages, and about 207,832 ha on unreserved village land. The area of forest in forest reserves is smaller than the area of the forest reserves because some forest reserves include natural non-forest areas such as grasslands or as in the case of the district council forest reserves, have been converted to agriculture.

By forest type, the district has 35,442 ha of sub-montane forest, almost entirely in protective national government and village land forest reserves, 424,172 of woodland, and 44,112 ha of *Commiphora* dominated thicket/woodland. A map of the forests is shown in Figure 2

²This estimate does not include any young regenerating forests that have started to grow in the past 15 years.

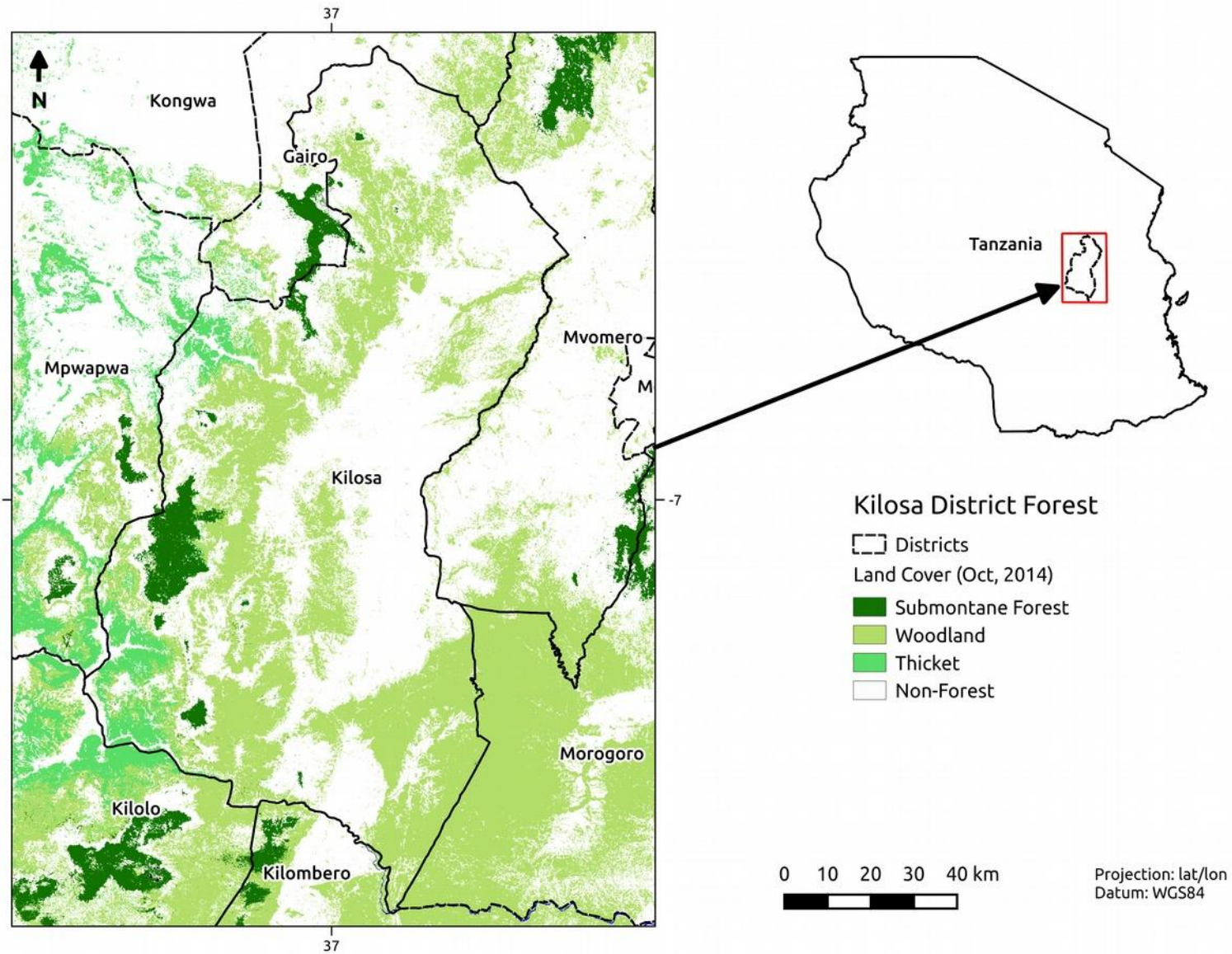


Figure 2: Kilosa District Forest Cover Map (October 2014)

1.7 Demand for Forest Products and Previous Harvesting Plan

Kilosa District is well connected to major the highways of Morogoro – Dodoma and Morogoro – Iringa on the Northern and Southern parts of the District respectively. Forest products from Kilosa District forests are frequently sold along the road side. This is due to the fact that forest products from Kilosa District can easily be transported to the urban markets of Morogoro, Iringa, Dar es Salaam and Dodoma. Empty trucks returning from upcountry and from outside the country and passing through Kilosa District have been the main means of transport for forest products such as timber, charcoal and fuelwood. Its close vicinity to major towns and easy transportation attracts more forest product dealers to Kilosa.

1.8 The Harvesting Plan Formulation Process

The Harvesting Plan formulation was commissioned by TFCG on September 9th 2015 in consultation with Kilosa District Natural Resources Office. The Terms of Reference were provided by TFCG, and background documents were provided by Kilosa District Council, FBD, TFS and TFCG. The formulation process started with a review of relevant documents. Documents were provided and reviewed during field activities in Kilosa District. Important documents reviewed are available in the List of References. The Plan formulation was undertaken in September to October 2015. The Harvesting Plan was developed by a team including representatives from the Forest and Beekeeping Division, Tanzania Forest Services Agency, Kilosa District Council, Sokoine University of Agriculture and selected representatives in four villages.

1.9 Key Definitions and Implications

1.9.1 *Un-reserved Forests on Village Land*

According to Section 7 (1) of the Village Land Act of 1999, village land shall consist of:

- Land within the boundaries of a village registered in accordance with the provisions of section 22 of the Local Government (District Authorities) Acts 1982.
- Land designated as village land under the Land Tenure (Village Settlement) Act 1965.
- Land the boundaries of which have been demarcated as village land under any law or administrative procedure in force at any time before this Act comes into operation whether that administrative procedure based on or conducted in accordance with any statute law or general principles of either received or customary law applying in Tanzania and whether the demarcation has been formally approved or gazetted or not;
- Land, the boundaries of which have been agreed upon between the village council claiming jurisdiction over that land and:
 - (i) where the land surrounding or contiguous to that village is village land, the village councils of the contiguous village;
 - (ii) where the land surrounding or contiguous to that village is general land the Commissioner; or
 - (iii) where the land surrounding or contiguous to that village is reserved land the official or public organisation for the time being responsible for that reserved land; or

Land, other than reserved land, which the villagers have been during the twelve years preceding the enactment of this Act regularly occupying and using as village land in whatever manner such persons or the village assembly or village council were allocated such land including land:

Lying fallow at any time during the said preceding twelve years;

Used for pasturing cattle belonging to villagers or to persons using that land with the agreement of the villagers or in accordance with customary law; land customarily used for passage of cattle.

This definition of village land clearly applies to the majority of unreserved land in Kilosa District.

On the other hand, the Land Act of 1999 defines general land as all public land which is not reserved land or village land includes un-used or un-occupied village land. In Kilosa District, the forests are undoubtedly used by the villages for fuelwood, poles and other non-timber forest products. Since the woodlands of Kilosa District are used by villages, in this Plan they are considered to be un-reserved forests on village lands. This is provided for in the Forest Act in Section 4 (c) which states that Village forests consist of:

- Village land forest reserves;
- Community forest reserves created out of village forests;
- Forests which are not reserved, which are on village land and which the management is vested in the Village Councils.

This Harvesting Plan is focusing on un-reserved forests on village land and the District Council Forest Reserves.

1.9.2 Local Authority Forest Reserve

The Forest Act of 2002 (Part I) defines "Local Authority Forest Reserve" as a forest reserve declared under section 22 of the Act to be a local authority forest reserve. According to Section 22 of the Act the Minister may declare a local authority forest reserve. 'A local authority forest reserve shall be an area of land covered by forest reserved or used principally for the purposes of the:

Sustainable production of timber and other forest produce;

Protection of watersheds, soil conservation and the protection of wild plants, known as a local authority protection of forest reserve; or

an area of land covered by forest reserved for the local authority.

1.9.3 Selective harvesting

In this plan selective harvesting means that only mature, commercial trees of a specific diameter (as per National Harvesting Guidelines of 2015) can be harvested so as to maintain the forest's natural eco-balance. Selective harvesting will allow the younger trees to grow for the next harvesting cycle. This provides younger trees with a chance to grow to their full commercial potential, while removing aged trees that would otherwise die naturally. Selective harvesting prohibits harvesting on river buffers and high terrain, protected trees species, seed trees and nesting trees.

1.9.4 Degraded forest

Former forest land severely damaged by: excessive harvesting of wood, fire, grazing, or poor management or other disturbances to a degree that inhibits or delays re-establishment of forests to its former status.

1.9.5 Timber/sleepers

According to Part 1 Section 1 of the Forest Act of 2002, "timber" means any wood or tree which has fallen or has been felled or cut off and all wood whether unsawn, hewn, sawn or machined, split, or otherwise cut up or fashioned and shall include lumber (sawnwood), flooring strips, shingles, and sleepers but does not include any article manufactured from such wood or firewood. Sleeper is an oversize sawn wood.

2) THE HARVESTING PLAN

The Kilosa District Harvesting Plan provides clear guidance to all stakeholders on its objectives, scope, procedures, monitoring and reporting. The Plan is aligned with relevant laws, policies and regulations including, but not limited to, the Forest Policy, the Forest Act 2002 and its regulations; and the Village Land Act 1999. The Plan promotes free, prior and informed consent and equitable benefit sharing for villages whose land is covered by the Plan. Also, this Plan is intended to contribute to the development of national guidelines on the development of district harvesting plans that integrate timber and charcoal.

2.1 The Objectives and Scope of the Harvesting Plan

2.1.1 Objectives of the plan

The objectives of the district harvesting plan include:

promoting ecologically sustainable harvesting of forest products including timber, fuel wood and charcoal;
promoting good governance including transparency, accountability and participation;
promoting equitable benefit sharing;
promoting free, prior and informed consent for communities; and
revenue generation for local government.

2.1.2 Scope of the plan

The scope of this Harvesting Plan focuses on procedures for harvesting timber and charcoal in un-reserved forest on village land and Kilosa Local Authority Forest Reserves. The harvesting plan stipulates the following:

- Roles and responsibilities of different stakeholders including of the District Harvesting Committee, LGAs, TFS, Village leaders and others.
- Procedures to be followed by those requesting permission to harvest to ensure transparency and the free, prior and informed consent of the communities on whose land harvesting is proposed.
- Permits to be issued to those requesting permission to harvest.
- Procedures for identifying the trees to be harvested and mechanisms to ensure compliance.
- Schedule of fees to be paid by those requesting permission to harvest.
- Schedule of fees to be paid to the villages from whose land timber is harvested; and those to be retained by the District.
- Procedures for the district to channel revenues to the affected villages.
- Procedures for seeking and documenting consent from communities with forests covered by the plan.
- This plan cannot be used as a basis for harvesting in Village Land Forest Reserves (VLFRs).
- Procedures to adjust the plan when communities include their village forest in village forest reserves.
- Monitoring and reporting procedures and responsibilities.
- Strategies to ensure enforcement of the plan and procedures for addressing those who contravene the plan.
- Communication and visibility of the plan.
- This Plan will be reviewed after every five years.

2.2 Criteria for a forest to be harvested

In order for un-reserved forests on village land or local authority forest reserves to be eligible for harvesting, the following criteria need to be fulfilled:

2.2.1 Criteria for un-reserved forests on village land

- A forest assessment to determine the harvestable potential species and their volumes for timber and charcoal production needs to be conducted. This assessment will help to establish the quality of the forest in terms of biodiversity value, catchment value and vulnerable areas such as steep slopes and valleys that are susceptible to degradation.
- A current forest harvesting plan should be in place that shows: species, volume, annual harvesting quotas that can be sustainably harvested. Such a plan should also adhere to the legal procedures. Additionally, the harvesting plan should show that reserved/protected tree species are not allowed to be harvested without a legal written permit or license.
- The status of forest condition should be known to help decisions on whether the forest should be harvested or left for conservation /regeneration e.g. degraded forests should be protected to facilitate regeneration.
- Approval of the village assembly for a forest inside the village boundary to be harvested is required. Moreover, the villages should develop by-laws in order for them to be able to benefit financially from the forest products harvested from unreserved forests on village land.

2.2.2 Local Authority Forest Reserves

- A Forest Management Plan is a pre - requisite condition for sustainable management of forest reserves. The preparation of a management plan involves forest inventory to determine the resource base. The plan indicates and guides the forest manager as to what, when, where, how and who to undertake forest management activities in and outside the forest reserve
- A Forest Harvesting Plan is required and should show species, volume and annual harvesting volumes and coupes. The plan should provide legal procedures to be fulfilled by relevant stakeholders. Also, the Plan should indicate that reserved / protected tree species are not allowed to be harvested without a legal written permit or license.
- District by-laws should be in place as a necessary tool for implementing forest management and harvesting plans.
- The forest condition should be known to help a decision on whether the forest should be harvested or protected. For example, the highly degraded forests of Magubike South and Magubike North should be protected at least for five years to allow regeneration after which this decision will be reviewed. In addition, Kwambe area which is part of the Magubike North Forest Reserve was politically and administratively re-allocated by District authorities to pastoralists without revoking the Government Notice No. 330 that created the reserve in 1995. The reallocation was done in 2009 for the purpose of reducing the conflicts between farmers and pastoralists. Therefore these forests cannot be part of this Harvesting Plan.

2.3 Application Procedures

2.3.1 Unreserved Forests on Village Land

Timber and charcoal harvesting in **Unreserved Forests on Village Land** requires the following procedures:

- The forest dealer identifies the forest in the village to be harvested.

- Forest dealer applies by submitting an application letter to the village council addressed to the village executive officer describing the unreserved forests on village land intended to be harvested, by specifying the type of forest produce, species and quantity.
- The application letter is discussed by the Village Council and Village Natural Resource Committee to assess whether the request is compatible with the assessment and criteria referred to in Section 3.4 of this document.
- The applicant (Forest Dealer) to fill a special application form named TFS 1 providing information in sections A, B, C, D and E.
- Relevant section in TFS.1 will be filled by the Village Executive Officer.
- Application for permits should comply with Section 49 of the Forest Act which provides the legal basis for issuing permits for the harvesting of forest produce from un-reserved forests on village land. Section 6 requires that the Village Council shall approve by resolution and such resolution shall be confirmed by the Village Assembly before permits can be processed. Once the requests have been approved, signed minutes from the Village Council and Village Assembly meetings shall be attached with special application form (TFS 1) and submitted to the District Forest Office for registration.
- A copy of the TFS 1 form shall be retained by the Village.
- The DFO will submit the registered application forms (TFS.1) together with the District Harvesting Plan to the District Harvesting Committee for decision making.
- The applications are discussed by the District Harvesting Committee on a quarterly basis.
- Based on the Committee's recommendations, the DFO will issue a license to the applicant, after paying relevant fees.

2.3.2 Local Authority Forest Reserves

Timber and charcoal harvesting in Local Authority Forest Reserves require the following procedures:

- DFO submits proposal for harvesting in a Local Authority Forest Reserve to the DNRO who presents the proposal to the District Council Management Team (CMT) for discussion. After being discussed by the CMT, the proposal is taken to the District Environmental Committee for approval prior to being approved by the District's Full Council meeting.
- After being approved by the Full Council meeting, the tender for harvesting District Authority Forest Reserve is announced/advertised by DED giving conditions (e.g. registration, TIN, address, security bond, bank statement) and instructions on how to apply.
- District Council Tender Board receives applications.
- District Council Tender Board processes the applications and award.
- District Council is informed of the District Tender Board decisions
- The District Harvesting Committee is informed for final decision making

Notwithstanding the above procedure, the current status of the Local Authority Forest Reserves do not allow harvesting.

2.4 District Harvesting Committee

The Ministry of Natural Resources and Tourism is responsible for guiding the composition, roles and operations of the District Harvesting Committee. The Committee has been established according to the Forest Act 2002, Government Notice No. 69 and 70 of 2006 and National Harvesting Guidelines of 2015. All applications approved by village governments are to be forwarded to the District

Harvesting Committee for scrutiny, approval or rejection. The current composition of the District Harvesting Committee is as follows:

Regional Natural Resources Officer	Chairman
District Administrative Secretary	Member
District Forest Manager (DFM)	Secretary
District Land and Natural Resources Officer	Member
District Forest Officer	Member
VEOs of villages that have approved applications (Section 3.3 above)	Member
Chairpersons of villages that have approved applications (Section 3.3)	Member

The number of Village Chairperson and Village Executive Officers in the meeting will depend on the number of villages submitting applications for harvesting. The committee meets once per quarter to go through all applications and make decisions. The decisions of the meeting will be implemented in collaboration and with full knowledge of the Village Natural Resources Committees (VNRC) in villages where harvesting operations will be carried out. The Committee will use this Harvesting Plan to guide decisions.

2.5 Permit and License Procedures

2.5.1 Unreserved Forests on Village Land

According to the National Harvesting Guidelines 2015 licensing procedures for harvesting forest products (timber, charcoal and commercial firewood) in village forests is as follows:

- Application approved by respective village in accordance with Section 49(6) of the Forest Act
- The forest dealers should be registered for specific forest produces
- Application approved by District Harvesting Committee
- Possession of a valid license to harvest in the unreserved forests on village land granted by the DFO.

2.5.2 Local Authority forest reserve

According to Section 49 of the Forest Act of 2002, a permit is required to be issued for gathering and taking away specific forest produce (e.g. charcoal), felling or extracting timber for domestic, commercial or export in a local authority forest reserve subject to such conditions as may be attached to the said permit.

Section 49(4) of the Act states that no permit shall be granted unless the activity is consistent with the forest management plan applicable to the local authority forest reserve and also the activity complies with written laws pertaining to the environment or land which are applicable to that forest reserve.

- Procedure for a permit application is provided in Section 50 (1) of the Forest Act of 2002 which states that an application for a permit shall be:
 - submitted on a prescribed form;
 - accompanied by the prescribed fee;
 - signed by the applicant or a duly authorized representative or agent of the applicant;

- sent to the Forest Manager of the local authority forest reserve in which it is proposed to undertake the activity for which the permit is being applied for;

The Forest Manager may, by notice in writing, require an applicant to supply more information. A list of all applications received shall be affixed (in conspicuous places in the offices of the local authorities and the relevant Village Councils) for not less than fourteen days before a meeting for decision is held by the District authority having jurisdiction in the area. The forest manager shall maintain a register of applications which have been submitted to him/her in the prescribed form which shall be available for inspection by the members of the public during office hours. Section 53 of the Act provides procedures for permit variations and modification. Section 54(11) provides conditions to surrender the permit to the Forest Manager. Section 55(1) provides revocation or suspension of the permit by the Director.

2.6 Jurisdictions and area of Operation of the Plan

This Plan will operate in Kilosa District. The areas of jurisdiction are (1) unreserved forests on village land (ii) Local Authority Forest reserves. This Plan excludes Mikumi National Park, game reserves, central government forest reserves and village land forest reserves/community forest reserves and plantations. The Plan focuses on timber and charcoal only in the District. The Plan encourages harvesting of other produces to be done sustainably.

This Harvesting Plan is flexible as it is possible to adjust the plan when a village declares part of its un-reserved forest to become a village land forest reserve. The procedure to follow for un-reserved forest on a village land to become village land forest reserve is given in Section 3.8.4.

In case a village decides to up-grade part of its un-reserved forest land to VLFR the information in Annexes 4, 5 and 6 will have to be adjusted i.e. involved villages, un-reserved forest area to be harvested, timber spp, and the total harvestable volume, annual sustainable timber volume that can be harvested. The adjustment has to be reflected in the Kilosa District Harvesting Plan. DFO and DFM will have to initiate the process of reviewing the District Harvesting Plan, submit the adjusted Plan to the District Harvesting Committee and to the District Council for approval. The adjusted Plan has to be sent back to villages for implementation.

Forest reserves under Kilosa District Council authority include Magubike South (15,055 ha) gazetted in 1995 through Government Notice number 329 and Magubike North (9,599 ha) gazette in 1995 through GN 330. However, these two forest reserves are highly deforested and degraded due to human activities. Therefore harvesting will not take place in these forests. The Plan will focus on forest development such as conservation activities.

2.7 Roles and Responsibilities

The key stakeholders in the Harvesting Plan are the DFO, District Land and Natural Resource Officer (DLNRO), District Economic, Works and Environmental Committee of the District Council, Kilosa District Council, District Harvesting Committee, Customer and villages. The key actors have different roles and responsibilities. Annex 3 presents the roles and responsibilities of different stakeholders.

2.8 Cutting Cycles

The Harvesting Plan provides estimates of how much can be harvested annually and sustainably. In principle, the total harvestable volumes of every potential unreserved forest on village land will be estimated and divided into annual quotas using a harvesting cycle of 50 years for timber and 90 years for charcoal to ensure sustainable harvesting based on natural regeneration. Taking *Pterocarpus angolensis* as an example, Shackleton (2002) reported the mean annual diameter increment of 0.45 cm and Von Maltitz and Rathogwa (1999) reported the growth of 0.35 cm per year. On the other hand, the minimum harvestable diameter of *Pterocarpus angolensis* in Tanzania is 45 cm (URT, 2002b). Using a harvesting cycle of 50 years and annual diameter increment of 0.45 cm implies that after 50 years trees that were 22.5 cm in diameter and above will be ready for harvesting. This means it is possible to harvest *Pterocarpus* using a harvesting cycle of 50 years. Also a study in Zimbabwe by Grundy (1995) reported the mean growth of 0.27 cm per year for all trees in an area protected from fire and human disturbance. Using harvesting cycle of 50 years and the annual mean growth of 0.27 cm per year implies that after 50 years trees that were 31.5 cm in diameter and above will be ready for harvesting.

Note that the rotation for timber is shorter because potentially harvestable timber volume is calculated only from trees already above the legal minimum diameter for harvesting (LMDH) and they are assumed to already be at least 50 years old. Charcoal harvesting includes trees which are much smaller (an assumed starting age of at least 10 years) and thus a longer period is required to replace the existing stock, which also includes very old trees. Since very large trees are not required for charcoal production, a shorter rotation could be used (e.g. 24 years) to capitalize on the faster growth of younger trees, but since the unreserved forests on village land are being managed for both timber and charcoal simultaneously and will not have the level of management in a true village forest reserve it is more appropriate to use a longer rotation. Also, with a 90 year rotation, the effective seed to harvest rotation for charcoal is the same as for timber – 100 years.

Therefore the harvesting cycle of 50 years for timber is considered practical and used in this Plan. The harvesting cycle is adequate because the harvested areas will be managed by the Village Natural Resource Committee to protect it against wildfires, grazing and shifting cultivation. This will also provide enough time and conducive environment for the un-harvested (small) trees to reach harvestable size.

For easy monitoring, evaluation and reporting, a licensed forest dealer will be allocated wood volume from the annual quota. Harvesting of annual quota will be supervised and monitored by the District Forest Manager with the support of Village Councils (Village Natural Resources Committees) who should also ensure that, trees to be felled are marked. Trees intended to be harvested each year will be identified and marked e.g. by paint and volume estimated after which the customer will be allowed to make the payment. Harvesting will then start by felling marked trees.

Regarding timber, before a customer is allowed to remove or process logs, the stumps shall be marked by the DFM using an FD hammer. For pit sawing, the DFM, District Forest Officer and Village Natural Resources Committee shall ensure that the customer has filled the pits and put off any fires used during harvesting.

Chain saws shall not be used in the forests for any operations.

Sawing machines with high recovery rate shall be used for the timber operations.

Directional felling shall be applied to reduce ecosystem disturbances.

Only fully matured trees shall be considered for harvesting.

Regarding charcoal harvesting the following shall be taken into consideration:

Timber species (see Table 3-2), except *Brachystegia* spp, shall not be harvested for charcoal, except branches left during timber harvesting and timber trees with poor quality (e.g. rotten, crooked and burnt by fire).

Charcoal production should use efficient technologies (e.g. half-orange, IBEK or Casamanse Kiln) as provided in the National harvesting Guidelines of 2015

Reserved tree species shall not be used for charcoal making

Trees for charcoal production will be harvested selectively as defined in Section 1.9.3

Remains of the trees harvested for timber will be used for charcoal making. Timber harvesters will not engage in charcoal production. Charcoal will be produced by those with permits and trained.

2.9 Blocking Procedures, Forest Potential and Harvesting Operations in Un-Reserved Forests on Village Land

Kilosa District is estimated to have an area of 162,541 ha woodlands suitable for timber harvesting and 158,206 ha of woodlands and thicket suitable for charcoal harvesting on unreserved village land and municipal sub-villages in villages. These estimates of area under un-reserved forests on village or municipal land includes forests left out of village land forest reserves in villages that have established village land forest reserves. Potential harvestable volume in an un-reserved forest on village land is calculated by dividing the existing harvestable stocks by the number of years in a harvesting cycle to determine annual harvesting quotas. The harvesting cycle of 50 for timber and 90 years for charcoal shall be used to determine annual harvestable volume quotas.

2.9.1 *Timber potential*

Potential sustainable timber harvesting was estimated through a combination of ground surveys of forest, GIS and remote sensing carried out in 2015.

The remote sensing used a combination of historical Landsat imagery and PALSAR radar imagery to arrive at a reliable map of forest areas in Kilosa that have been forested at least since 1998. Forest areas were broken into three forest types: sub-montane forest, woodland, and thicket. A map of Kilosa showing the distribution of these forest types in 2014 is presented in Figure 2.

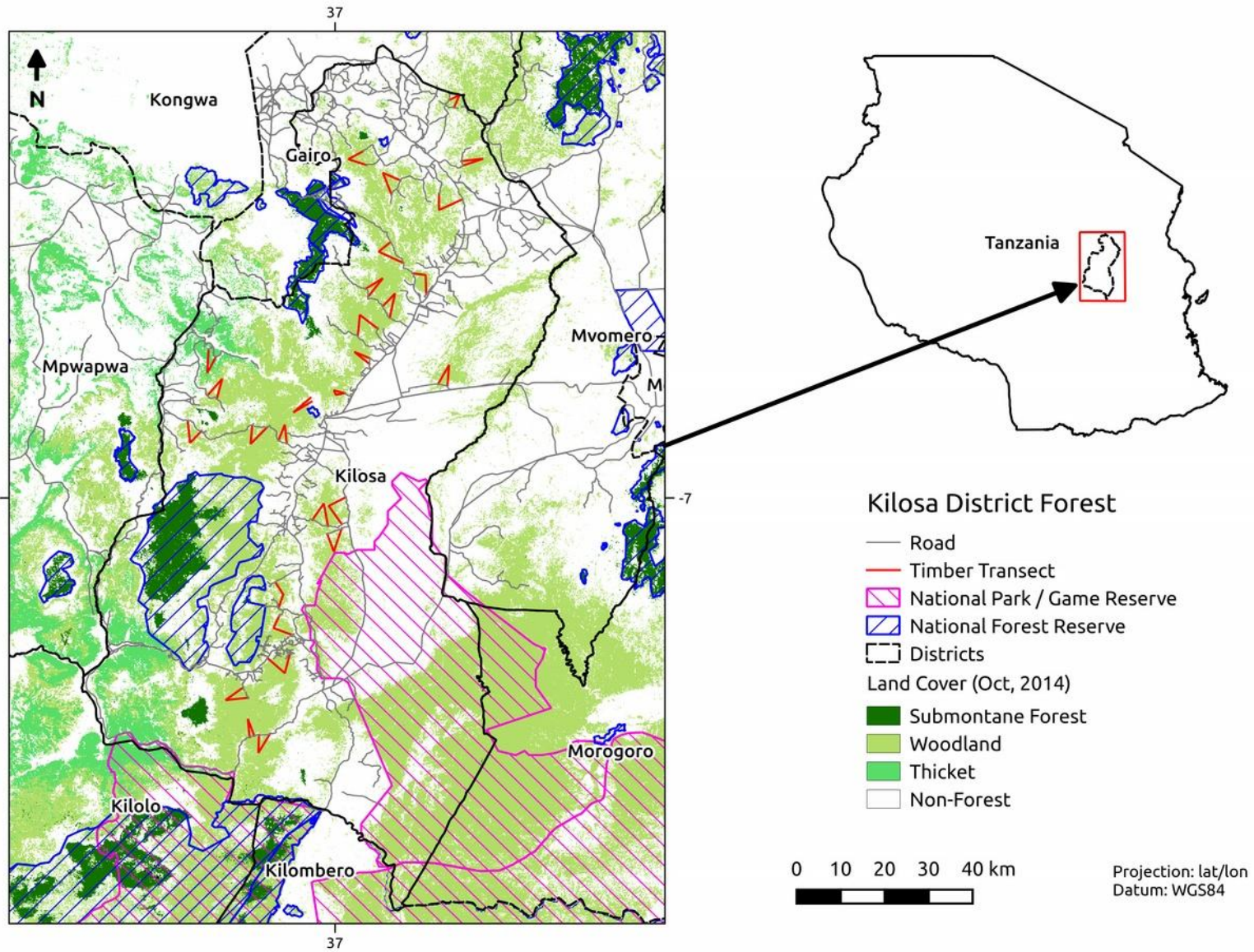
Nearly 100% of the remaining sub-montane forest in Kilosa is protective government or village forest reserves. Therefore, no harvesting is anticipated in this type of forest. Furthermore, initial surveys of the thicket areas in the western parts of the district revealed that they contained no valuable timber species (in addition to being nearly impenetrable). Therefore, only woodland areas were considered when estimating the sustainable timber harvesting levels for the district.

Ground surveys were conducted using 27 transects (an additional transect was in thicket and was discarded). The transects were 10 meters wide, 6 to 10 km long and evenly distributed throughout woodlands in the district. They were planned to run more or less perpendicular to roads since distance to road is probably an important factor in determining timber stocks. A map of the transects is presented in Figure 3. In total, the transects covered 245 ha of woodland.

The transect teams recorded the name and DBH of all timber trees with a DBH of at least $\frac{1}{2}$ the legal minimum diameter for harvesting. Then the data was entered into a spreadsheet designed by the Mpingo Conservation and Development Initiative to calculate timber stocks based on transect data.

Then a map of all of the villages in Kilosa based on boundary maps from the Ministry of Lands was overlaid on the map of unreserved woodlands to calculate the amount of unreserved woodland in each village. Finally, the timber stocks for each village were calculated by scaling the district level stocking data to the area of unreserved woodland within each village. No timber stock data was calculated for villages with less than 200 ha of unreserved woodland. Also, the timber stock data for a few villages whose woodland is not miombo, was limited to the species known to occur there.

The potential sustainable timber offtake for each village from unreserved forests is listed in Annex 5 and Annex 6.



17 | Page **Figure 3: Kilosa District 2015 Timber Transects and Forest Cover**

2.9.2 Charcoal potential

Like timber, potential sustainable charcoal harvesting levels from unreserved forests in village land were estimated through a combination of ground surveys and remote sensing.

Ground data was obtained from biomass plots conducted in the southern half of the district as part of the TFCG/MJUMITA REDD project in Kilosa. In total, 402 plots were conducted in woodland or tall thicket (Figure 4). Potential stocks for charcoal harvesting were calculated by removing all timber species except *Mtondoro* and *Myombo* and all trees less than 10 cm DBH. The result was 35 tons of biomass per ha on average. There was not a significant difference between the tall thicket and the woodland parts of the district.

The Transforming Tanzania's Charcoal Sector project has previously estimated the efficiency of different types of charcoal kilns used in the district. The average efficiency in terms of conversion of biomass to charcoal was about 15%. Thus, taking 15% of 35 tons per ha, the average hectare in the district can produce 5.25 tons of charcoal once timber and trees smaller than 10 cm DBH are excluded. Then, dividing that figure by 90, yields potential sustainable charcoal harvesting of 0.0583 tons of charcoal per ha per year over a 90 year rotation.

In practice, charcoal harvesting tends to be less selective than timber harvesting. Thus, it is not ideal to harvest charcoal in areas of steep slope prone to erosion or where regeneration will be hindered by more intense fires. Thus, for charcoal before calculating the amount of unreserved woodland and tall thicket falling within each village, it was also necessary to remove all woodlands and tall thickets from unreserved village lands that were on slopes greater than 40%.

The estimates of potential sustainable annual charcoal harvesting from unreserved village land are presented in Annex 6.

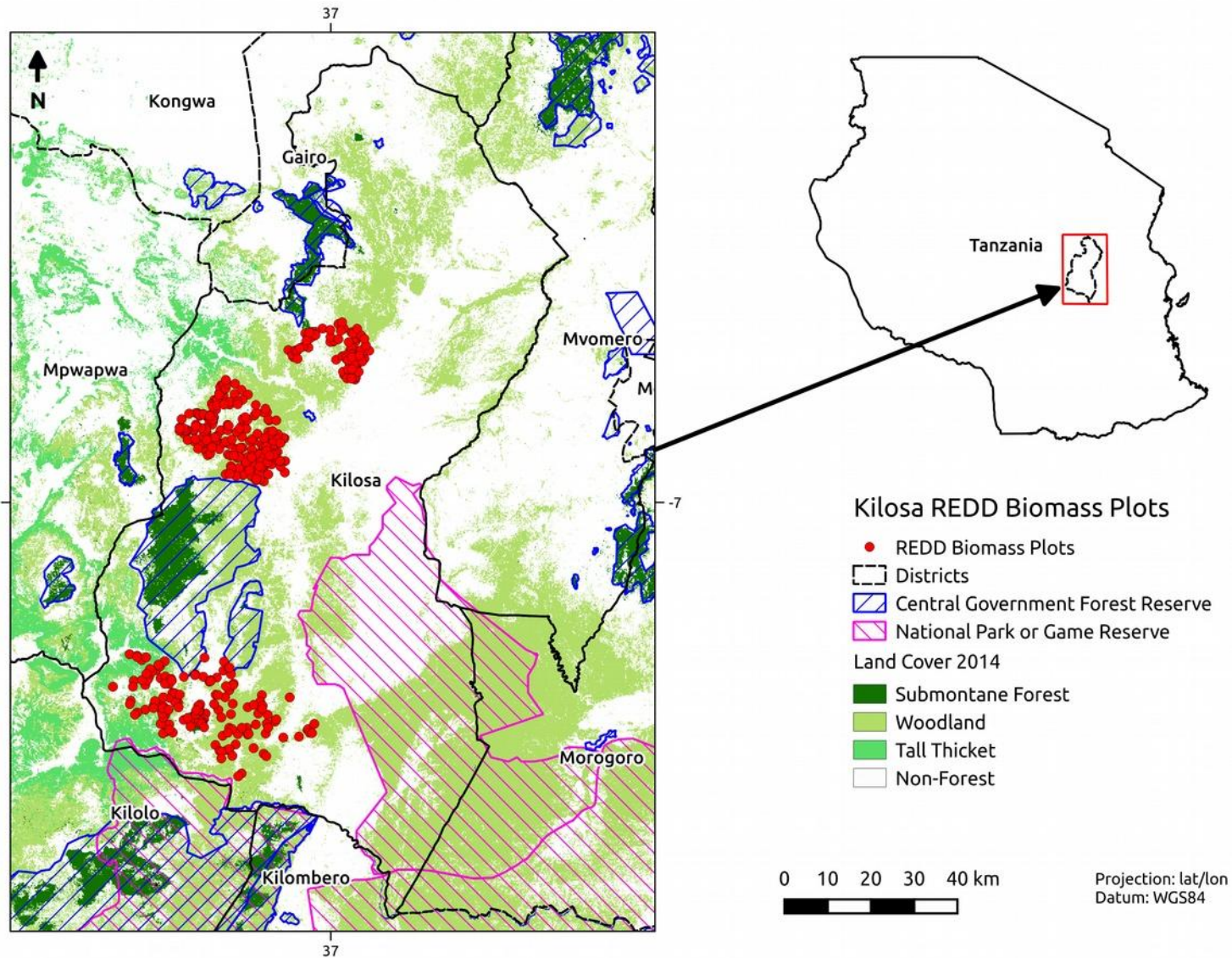


Figure 4: Kilosa biomass plots used to estimate potential charcoal making stocks.

2.9.3 Timber harvesting operations in un-reserved forests on a village land

Timber harvesting will be carried out in areas earmarked by villages in un-reserved forests on village lands. For easy monitoring, evaluation and reporting, a licensed forest dealer will be allocated wood volume from the annual quota. Trees that will be harvested shall be identified and marked e.g. by paint and volume estimated by the DFM with support from the village natural resource committees after which the customer will be allowed to make the payment. Harvesting will then start by felling marked trees and cross-cutting into logs. The logs and stumps will be marked using FD Hammer by DFM. Logs will be processed into sawnwood / sleepers and the volume measured, or logs will be transported as a whole. The recovery rate 30%, 60% and 70% of the standing volume will be used to calculate volume of sawn timber, sleepers and logs respectively.

Timber cutting rules:

- Chain saws shall not be used in the forests for any operations.
- Sawing machines with high recovery rate shall be used for the timber operations.
- Directional felling shall be applied to reduce ecosystem disturbances.
- Only fully matured trees shall be considered for harvesting.
- Also, timber trees with environmental and biodiversity importance (e.g. nest trees, fruit trees, trees on slopes and water sources) shall not be harvested for timber.
- Remains of the trees harvested for timber will be used for charcoal making. Timber harvesters will not engage in charcoal production. Charcoal will be produced by those with permits and trained.
- For pit sawyers, the DFM, District Forest Officer and Village Natural Resources Committee shall ensure that the customers fill the pits and put off any fires used during harvesting.

2.9.4 Charcoal harvesting operations in un-reserved forests on a village land

Charcoal production will be done in the same areas that were earmarked by villages after timber harvesting. Also, charcoal production on a limited scale can be directed to trees felled during new agricultural plots preparation in areas set by the village for agriculture. This will not be selective harvesting, but charcoal making using trees felled during new agricultural plots preparation will be done in accordance with the District harvesting Plan. This will reduce demand for cutting trees from none farming areas.

Together with the above conditions, also the following shall be taken into account during charcoal production:

- Timber species (see Table 3-2), except *Brachystegia* spp, shall not be harvested for charcoal, except branches left during timber harvesting and timber trees with poor quality (e.g. rotten, crooked and burnt by fire).
- Charcoal production should use efficient technologies (e.g. half-orange, IBEK or Casamanse Kiln) as provided in the National harvesting Guidelines of 2015
- Reserved tree species shall not be used for charcoal making
- Trees for charcoal production will be harvested selectively as defined in Section 1.9.3
- Only trees above 15 cm diameter will be harvested.
- All trees that support ecosystem biodiversity (e.g. nest trees, fruit trees) shall not be harvested.
- Trees within water sources, steep slopes, areas prone to soil erosion shall not be harvested. The Environmental Management Act of 2004 Section 57 (1) prohibits human activities that can affect river banks, water dams or reservoirs etc. within 60 m. Also, the Kilosa District Council By-law

of 2015 (Part 4 Section 16) prohibits human activities such as agriculture, tree cutting, grazing within 60 meters from the water sources. Steep slopes are recognized as environmental sensitive areas by EMA 2004 Section 52. The Minister responsible for environment shall determine a gradient not to be exceeded after taking account of proper scientific advice.

3) FOREST DEVELOPMENT AND GOVERNANCE

3.1 Compliances to Relevant Laws, Policies and Regulations

In order to ensure sustainable supply of forest product such as timber and charcoal the Government has put in place several policies, laws, regulations and guidelines that must be complied with.

Regarding timber and charcoal harvesting the following provisions in the Forest Act of 2002 are among the most important to be observed:

- Harvesting of forest products for business purposes requires a license.
- Harvesting should be done according to the harvesting plan.
- All applications for harvesting of forests in un-reserved forests on a village land should be approved by the Village Councils.
- All applications for harvesting of forests (of more than 3 m³) should be approved by the District Harvesting Committee.
- Reserved tree species are protected by law, therefore can only be harvested with a written permit and license from the DFO.
- A Transit Pass (TP) is required for transportation of forest products. In accordance with Section 7.5.1 of the National Harvesting Guidelines of 2015. A Transit Pass is issued by the DFM or any other authorized forest officer. The Transit Pass shall include: the name, License number, Registration number, type and quantities of forest produce and means of transportation *inter alia*.
- Transportation of forest products should be between 6 am to 6 pm.
- Vehicles used for transportation should be open to allow quick verification.
- Logs, timbers and stumps should be marked with an FD Hammer from the respective district.
- Vehicles carrying forest produce should stop at every forest checkpoint for inspection.
- For each harvestable species a minimum girth of trees that may be felled is provided for in the Third Schedule of Forest Regulations of Forest Act 2002, for example, *Brachystegia spiciformis* is 55 cm and *Terminalia* spp 45cm which are common in Kilosa District.
- Charcoal production should be done using efficient kilns.
- Timber should be produced using high recovery technologies.
- Use of chain saws is prohibited.
- Every timber tree permitted to be felled shall be cut at a height not exceeding 15 cm above the ground.
- All timber and charcoal business centres should be registered.
- All sawmills should be registered.
- Charcoal bags shall weigh approximately 75 kg per bag as stipulated in the Forest (Amendment) Regulations of 2015 Part II Item 5.
- Removal of the forest produce allowed by license shall be completed within the period prescribed in the license or within such further period as shall be extended by the District Forest Manager upon payment of prescribed fees.
- The license holder must fill-up pits dug during the process of timber and charcoal harvesting.

In addition to the above, District administration have agreed that the DFO shall identify and set selling centers for charcoal. Charcoal sale points should be known and enforced. The charcoal selling centers proposed include: Morogoro - Mikumi Road (Charcoal selling centers to be at

Msimba and Doma), Morogoro-Dodoma Road (Charcoal selling centers to be at Maguha, Berega and Kiyegeya). More charcoal selling centres can be identified.

3.2 Natural Regeneration

The potential for woodland to produce charcoal and timber sustainably mainly hinges on the ability of the woody species to regenerate and grow. Woodland regeneration generally involves coppicing of the harvested trees, natural seeds production and germination, vegetative regeneration and overall survival of seedlings. In the absence of intense disturbance such as frequent late fires and overgrazing, woodlands have the capacity to regenerate almost to their original status. Unless the trees have been uprooted, most of the subsequent development of woodland will be derived from re-growth of coppice from the surviving stems, stump/root sucker shoots and recruitment from old stunted seedlings already present in the grass layer at the time of tree cut, fall or death (Chidumayo, 1993).

Therefore, one of the principles for sustainable forest management in the woodland areas is to encourage natural regeneration. Natural regeneration is easier in miombo woodlands and is favoured by villages compared to tree planting because tree planting requires more time, labour and other resources and survivorship of regenerating trees is higher than planted trees. Regeneration of miombo also provides added benefits in terms of biodiversity conservation compared with the introduction of exotic tree species.

Literature shows that the most efficient way to restore vegetative cover in miombo is to protect it from grazing, wildfires and expansion of agriculture. Vegetation will usually regenerate naturally, even on bare lands if such land remains undisturbed. On the other hand, enrichment planting of trees in degraded areas would speed up the process. In such cases, indigenous tree species should be used.

Overall, in order to ensure effective regeneration in the timber and charcoal producing areas, the following need to be taken into consideration:

- Ensure a few seed-producing trees are left uncut to facilitate adequate regeneration.
- Disused paths and tracks should be closed so that regeneration of secondary vegetation occurs.
- Enrichment planting may be done in harvested areas using indigenous species that will not change the vegetation composition.
- Wildfires are controlled and fire management is implemented to ensure maximum natural regeneration.
- Natural regeneration in the harvested areas should be protected against grazing, wildfires, shifting cultivation through By-laws and regular patrols.

3.3 Tree Planting

According to the National Guidelines for Forest Products Harvesting of 2015 Section 7.1 requires that a harvesting plan should among other things include the number of trees to be planted in the harvested areas. Consequently, each DFO and DFM is required to have approved harvesting and tree planting plans for their districts. Also, Section 7.2.3 of the National Guidelines for Forest Products Harvesting of 2015 point out that the District Harvesting Committee is responsible for following up on the implementation of a tree planting plan in the harvested areas and for providing advice to the TFS and DED. In addition, the District Harvesting Committee is required to submit a report on tree planting activities, including number of trees planted and survival rate for the

planting season before the next harvesting season. Tree species that can be promoted for planting may include fast growing hybrid species and those species with dual benefits.

Currently, Kilosa District Council is required to plant 2,000,000 tree seedlings annually. At present tree seedling production for tree planting activities is done by various institutions in the District. The main objective of tree planting is to supplement trees cut for timber and charcoal making from the natural forests. The plan for each institution from year 2015/16 is shown in Table 3-1. In this Plan every village in Kilosa is expected to plant 10,000 seedlings annually. However, in-order for tree planting to be effective, the planted trees should be tended and protected to ensure survival.

Table 3: Annual plan for seedling production and tree planting in Kilosa

Institution	Seedling production Annual target for tree planting	Remarks
118 villages (10,000 per village)	1,180,000	Supported by TFCG/MJUMITA, WWF, TaFF, KDC
ILOVO	300,000	
Religious Institution	50,000	
Primary school	85,000	
UDUFAGECO	50,000	Supported by SUA (under EPINAV)
WAMAJUKUU	20,000	
STETIANA	10,000	
AZIMIO	10,000	
RUKWIMAGE	12,000	
Emasha	20,000	
Kambarage	20,000	
Kituma	15,000	
TFS (District Forest Manager)	10,000	To support villages
Others	300,000	
Total	2,082,000	

3.4 Ecologically Sustainable Harvesting

Charcoal and timber harvesting requires protecting the ecology of the forest. That means the activities should have minimum impacts to water sources, biodiversity, wildlife, soils and the entire ecosystem functions.

According to the Kilosa District Council By-law of 2015, the District is responsible for establishing, managing and protecting water sources. In these areas the District Council usually takes measures according to the District By-law against anyone who destroys / damages water sources or does not participate in water source protection activities without a compelling reason. The By-law states that tree harvesting should not be done within 60 metres from a water source. As pointed out earlier in Section 2.9.2 of this Plan, trees on steep slopes and valleys should not be harvested to avoid erosion. Although most villages do not have Village By-laws in which water sources, steep slopes and valleys are protected, sustainable timber and charcoal harvesting should note that it is prohibited for any person to conduct tree felling, or doing timber and charcoal activities which can harm in any means water catchment and environment conservation in un-reserved forests on village lands. Village councils should be encouraged to develop and approve By-laws to ensure protection of ecological sustainability including water sources areas in the timber and charcoal harvesting areas.

Timber and charcoal production should only be allowed in the area once the timber and charcoal harvesting plans that consider ecological sustainability are prepared and approved. Such conditions to ensure sustainable ecological harvesting are that:

- The harvesting methods that do not impair the original structure and diversity of the forest should be promoted.
- Harvesting methods should minimize impacts on the biological, chemical and physical soils characteristics.
- A map showing the protected sites within the harvesting areas should be available for effective monitoring ecological sustainability of harvesting.
- Protection of sites of religious, historical, cultural or particular socio-economic value should be ensured.
- The clearing of forests for farming (e.g. in Unone village) and related agricultural activities in the District be regulated through By-laws.
- Post-harvest species composition and density of undergrowth do not show increased abundance of populations of invasive species.
- Sensitive areas should be identified and selected through ecological survey and included in the protected sites in the harvesting areas.
- Ensures that standardized data on fauna and flora are available for effective ecological monitoring.
- Selective harvesting should be used instead of clear felling so as to ensure ecological sustainability.
- Ensured that diversity and relative abundance of fauna species do not change significantly.

An exhaustive list of the requirements guiding ecological sustainability are stipulated in the Environmental Management Act of 2004, therefore apart from the District by-laws (KDC, 2015a) and village by-laws it is very important to adhere to the Environmental Management Act to gather with the sectoral regulations.

In the long term, the District should aim for timber and charcoal certification by using experiences from Mpingo Conservation Development Initiatives in Kilwa. This will increase ecological sustainability and timber and charcoal harvesting legitimacy.

3.5 Governance and Control

At the time of preparing this plan in late 2015, forest harvesting in the District is characterized by very weak governance. Access to resources is almost complete unrestricted, leading to illegal and unsustainable production and trade without payments being made for the raw material (e.g. wood), and licenses and levies largely evaded. The main cause for these problems is inadequate and improper instruments, low transparency, low participation, and weak rule of law, lack of fair legal frameworks, low equity and inclusiveness, inefficiency on resource use, and low accountability.

Given a lack of resources in the government for day to day monitoring of forest harvesting, there is a need to involve the villages more closely in the implementation of the forest harvesting plan, initially through the following:

- Relevant staff at District (including DED, DLNRO, DFO and DFM) and village levels (Village Natural Resource Committee Members, Village Chairmen and Village Executive Officers) deal with forest harvesting in un-reserved forests on village lands and local authority forest reserves shall be trained on the elements of good governance (e.g. democracy, civil rights, transparency, and the rule of law, accountability, efficient public services delivery, conflict mediation, budgetary and financial management, revenue mobilization and public expenditures).

- Ensure implementation of all activities in a gender sensitive manner, ensure use of the principles of free, prior and informed consent, and paying attention to the cultural, educational and resource constraints that women may have.
- Proper application of the Forest Act by empowering the villages to manage the un-reserved forest on village land.

3.6 Royalties, Fees and Benefit sharing

3.6.1 Royalties and fees

Section 77 of the Forest Act of 2002 states that the Minister may determine and thereafter prescribe, the services and permits for which fees shall be charged by Forest Managers and their corresponding charge rates.

Section 77 (3) of the Forest Act 2002 states that no royalties shall be required for the harvesting or extraction of forest produce within a village forest reserve or a community forest reserve by the resident of the village or the members of a Group as the case may be unless such a requirement is specifically provided for any agreement under which they are managed.

Regarding payments for forest produce from unreserved forests on village lands are indicated in Table 4, 6, and 7. The payments include royalties, 5% of the royalty to be paid as a contribution to tree planting and other fees (transit pass, registration and fees for reserved trees).

Any fees, royalties or other imposts arising out of any permitted activity are owing to the Government. The DFO has a duty to collect all revenue from fees, royalties and licenses charged or issued in respect of such District local authority forest reserves and un-reserved forests on village land, and pay them into the proper accounts. DFM has a duty to collect revenue from Transit Pass on behalf of the Central Government.

Royalties for timber are paid according to timber classes. Table 4 summarizes timber classes that can be harvested from Kilosa District.

Table 4. Classes of timber tree species in natural forests, Kilosa District

Class	Botanical Name	Trade Vernacular Name	Legal Minimum Diameter for Harvesting (LMDH)*
IA	<i>Dalbergia melanoxylon</i>	Mpingo	24 cm
	<i>Combretum sp.</i>	Mlama	24 cm
IB	<i>Pterocarpus angolensis</i>	Mninga	45 cm
	<i>Millettia stuhlmannii</i>	Mpangapanga	55 cm
	<i>Xeoderis stuhlmannii</i>	Mnyenye	45 cm
	<i>Milicia excelsa</i>	Mvule	55 cm
	<i>Swartzia (Bobgunnia) madagascariensis</i>	Msekeseke	45 cm
	<i>Khaya anthotheca</i>	Mkangazi	55 cm
	<i>Afzelia quanzensis</i>	Mkongo	55 cm
	<i>Pericopsis angolensis</i>	Mwanga**	55 cm
	<i>Brachystegia microphylla</i>	Msani	55 cm
II	<i>Brachystegia specififormis / Julbernardia sp.***</i>	Mtondoro	45-48 cm

Class	Botanical Name	Trade Vernacular Name	Legal Minimum Diameter for Harvesting (LMDH)*
	<i>Albizia versicolor</i>	Mkingu, Mpilipili	45 cm
	<i>Burkea africana</i>	Mkarati	50 cm
	<i>Sterculia quinqueloba</i>	Mwembeti	55 cm
	<i>Acacia nigrescens</i>	Mkambala, Mkambaa	45 cm
IV	<i>Brachystegia boehmii</i> ****	Myombo	55 cm
	<i>Brachystegia bussei</i> ****	Mgelegele	55 cm
	?	Msungwi	55 cm
	<i>Pseudolachnostylis maprouneifolia</i>	Msolo	55 cm
	<i>Sclerocarya birrea</i>	Mng'ongo	55 cm
	<i>Terminalia sericea</i>	Mpululu	55 cm

Source: Forest (Amendment) Regulations, 2015

* These come from MCDI, who obtained them from MNRT. However, if the species was not in the list, the LMDH was set to 55 cm.

** Mwanga is described as *Hagenia abyssinica* in the 2015 regulations, but the Mwanga that is most commonly harvested in Tanzanian woodlands is almost certainly *Pericopsis* as *Hagenia* is a high rainfall species. In the 2013 regulations, Mwanga is listed as *Pericopsis*.

*** Apparently *B. spiciformis* is so often confused with *Julbernardia* that they are treated as the same. However, the timber of *B. spiciformis* is reportedly inferior.

**** The 2015 regulations only specify *B. spiciformis* (by virtue of it being confused with *Julbernardia*) and *B. microphylla* and thus all other *Brachystegia* would fall in class IV. However, the previous 2013 regulations put all remaining *Brachystegia* into class II.

Table 5: 2015 Royalties for different timber classes

Classes	Royalty per m ³ (Standing tree volume) (TZS)
Logs	
Class IA	264,960
Class IB	235,520
Class II	176,640
Class III	132,480
Class IV (Other species not listed above)	88,320
Poles of non-plantation forest species	
5 cm but not more than 10 cm diameter at butt each	1,500
Over 10 cm but not more than 20 cm diameter at butt each	2,200
Charcoal	
Fees for a bag of charcoal (75 kg per bag) or (Tsh. 240 Tsh/kg)	16,600
Firewood	
Firewood from natural forests (per stacked m ³ from dead branches and off cuts)	5,900

Source: Forest (Amendment) Regulations, 2015

In addition, the timber, charcoal and commercial firewood harvesters are required to pay 5% of the royalty paid appearing in Table 5 as a contribution to tree planting. This amount is currently administered by Tanzania Forest Fund.

Other fees are payable on services such as transit pass and registration. The current service fees as extracted from Forest (Amendment) Regulations, 2015 are presented in Table 6.

Table 6: Other fees payable on services related to forest products

Services	Fees payable in TZS
Transit pass application fees	
i) For a 7 tonne vehicle or below	7,500
ii) Above 7 tonnes	15,000
Fees for reserved trees	
Reserved trees on private farms should be 20% of respective forest royalty given in Table 5 above	20%
Fees for registration of forest produce dealers and traders per year	
Timber (For Pit sawyers in productive natural forest)	256,000
Timber yard	256,000
Charcoal	256,000
Firewood	256,000

All fees and royalties stated above are paid to the Central Government through TFS. In addition to the Central Government royalties, Kilosa District Council and Village Councils can collect Cess and fees respectively. Local government authorities such as villages have powers to formulate their own By-Laws within their area of jurisdiction. These powers are guaranteed by Local Government (District Authorities) Act CAP 287 and Local Government (Urban Authorities) Act CAP 288 (RE 2002). These acts provides the procedures under which local authorities can make by- laws. The by-laws shall stipulate fees that can be collected on the forest products harvested from their areas of jurisdictions. This means, such Cess and fees have to originate from the District Council and Village Council By-laws. The Kilosa District Council By-Law (KDC, 2015a) provides for collection of Cess from forest produce as shown in Table 7.

Table 7: Cess payable to Kilosa District Council for forest produce

Item	Cess (Tshs)
Firewood	400 per m ³
Charcoal	2,000 per bag
Timber	1,000 per piece

Source: The Kilosa District Council By-Law of 2015

Unfortunately, at the time of preparing this plan in 2015, most Village Councils had yet to formulate and approve by-laws that stipulate fees for the forest products such as timber and charcoal harvested from un-reserved forests on village land within their areas of jurisdictions. Village Councils are advised to formulate their by-laws that will allow them to charge fees on forest products from un-reserved forests on village land in areas of their jurisdictions. Collection of fees and issuing of permits must be linked to sustainable harvesting plan. Therefore harvesting from unreserved forests on village land should be done when by-laws are in place.

3.6.2 Benefit sharing

In order to maintain sustainable harvesting, benefit-sharing among stakeholders is an important item in the Harvesting Plan. Stakeholders with rights to benefit from harvesting of timber and charcoal include: villages in the harvested areas, the District Council and Tanzania Forest Services.

Currently, there are no agreed and approved benefit sharing systems for the local authority forest and un-reserved forests on village land that would directly benefit villages where harvesting is taking place. Benefit sharing in this Harvesting Plan can be improved through the following approaches:

- Regarding un-reserved forests on village land, Village Councils should formulate by-laws to enable them to charge fees for timber and charcoal harvesting. Therefore harvesting from unreserved forests on village land should be done when by-laws are in place.
- On District Council Forest Reserves, the Council should enter into Joint forest management agreement with adjacent villages to facilitate sharing of benefits in line with page 18 - 21 of the Joint Forest Management Guidelines of December 2013.

3.7 Revenue Generation for Local Government

The sources of revenues for District and Village Councils are provided in the Local Government Finances Act of 1982 and the amendments made to it since its enactments in 1982 up to 30th June, 2000 (URT, 2000).

Regarding District Councils, the Act allows Councils to collect all revenues derived from any cess (ranging between zero and five percent of the farm gate price); all revenues derived from licenses, permits, dues, charges or fees specified by by-law made by the District Council. Specifically, the Local Government Finances Act makes references to Section 10 of the Forest Act and directs the District Council to collect all revenues derived from fees for forest produce and licenses. However, Section 4 of the Local Government Finances Act directs that all revenues of a District Council shall be paid into the general fund of the Council therefore may not necessarily be available to the forest activities in the District.

The sources of revenues of Village Councils are also provided in the Local Government Finances Act. The sources mainly include all revenue derived from licenses, permits, dues, fees, charges or tariffs specified in the by-laws made by the Village Councils; and all taxes imposed on non major trading centres within the village boundaries. Relevant examples of taxes are on charcoal business (Tshs. 15,000/= p.a) and timber sales (Tshs. 20,000/= p.a). The Act allows Village Councils to formulate by-laws that prescribe reasonable fees, charges and tariffs for any license or permit issued by the Village Council. Therefore by-laws need to be in place before any harvesting can take place from the unreserved forest on village land.

3.8 Promotion of Free, Prior and Informed Consent for Communities

For the purposes of the District Harvesting Plan, the underlying principles of free, prior and informed consent can be summarized to include: (i) Information and consultation on preparation and implementation on the Harvesting Plan; (ii) Participation of villages on preparation and implementation on the Harvesting Plan and, (iii) Representation of villages to the harvesting committees.

3.8.1 Information and Consultation

In the formulation of this Plan, stakeholders at all levels were informed and consulted to provide their inputs important for the inclusion in the Plan. In other words stakeholders assisted in shaping the Plan. Implementation of this Plan is designed to ensure that villages' right to free, prior and informed consent (FPIC) will be recognized by all stakeholders and decision making bodies. These include Village Natural Resource Committees, Village Councils and District Harvesting Committee. For example, Chair persons of the Village Governments and Village Executive Officers are members of the District Harvesting Committee when considering harvesting applications from the respective villages.

At the village level, implementation of the harvesting plans will require informed consent from that village before harvesting can take place. In other words, the FPIC is required to be done in each village.

3.8.2 Village participation in the decision making process

Given the importance of charcoal and timber harvesting in the villages, and in order to adhere to the principles of FPIC, inputs of villages in the development and implementation of the Harvesting Plan is a requirement. Hence the participation villages in the decision making process is mandatory to ensure the Plan responds to their priorities, respects their culture and their choices of development. Participation of VNRC, Village Council, Village Assemblies and membership in the District Harvesting Committee guarantee the requirement of villages participation in the decision making process.

3.8.3 Representation of villages to the District Harvesting Committees

Villages' effective participation in the decision making organs relevant for timber and charcoal harvesting is paramount. The role of villages in the decision-making process and in negotiating or bargaining with other parties including forest dealers, district authorities is important. The existing governance structures at the village and district levels already allows for adequate representation.

However, villages need to be given an opportunity to build/strengthen their individual and collective capabilities in order to take advantages of available opportunities. To this effect, training and capacity building is important to support villages. Additionally, legal training should also be provided during implementation of the Plan on issues pertaining to timber and charcoal harvesting. Exchange visits have also become an increasingly important tool in training; therefore will be used in this Plan. Also, experience sharing with other villages that are already practicing sustainable harvesting may provide further insights and increase their capacity.

3.8.4 Procedures to declare un-reserved forest on village land to village land forest reserve on

The following are steps for the villages to follow as detailed in CBFM guidelines:

Stage One: Getting Started

This takes place at the district level, with the selection of villages and briefing of district staff, plus the formation of a team of staff with different skills to do the work. At the village level, you meet with Village Council and Assembly and facilitate the establishment and orientation of the Village Natural Resource Committee (VNRC).

Stage Two: Assessment and Management Planning

Village and forest boundary identification
Forest Assessment
Development of management plan
Forest By-Law development

Stage Three: Formalising and legalising

The management plan and bylaws are submitted to by the VNRC to the Village Council and Village Assembly for approval
Forwarded to the District Council for registration.

Stage Four: Implementing

Puts the systems needed to manage the forest in place (appointing and training the Patrol team, starting record collection and making sure the rules are known, and so on)

The district takes up a role of monitoring and supporting by keeping an eye on progress and helping out with problem-solving.

Stage Five: Revising and gazetting

Review and revise management plan based on what has been done so far

Request Forestry and Beekeeping Division to officially gazette their forest (but this is an optional step).

3.9 Coordination at District and National Level

Currently, timber and charcoal harvesting in the District in most cases is informal, almost totally unregulated, and open to any and all who wish to participate in it. Harvesting involves a multitude of commercial, institutional (village and district) and policy players who operate with no comprehensive, unified national, regional, district or local coordination thereby complicating monitoring activities. Coordination of District and village level governing institutions will be enhanced. In this Plan the coordination hub will be at the DFM/DFO offices. The DFM/DFO offices shall network with harvesting areas and authorities at village, district and national level. Charcoal producer associations will be promoted and expected to be key players of sustainable harvesting at village and district level.

In order to control illegal harvesting and improve revenue collection and law enforcement coordination will be done through:

- Increased information sharing and communication;
- Increased participation in decision making and implementation of the Plan;
- Use of existing networks;
- Promotion of joint patrol between stakeholders;
- Increased regular feedback meetings.

4) MONITORING AND EVALUATION AND ADJUSTMENT OF THE PLAN

4.1 Roles and responsibilities in monitoring the plan

There should be a mechanism set in a participatory way to monitor the Harvesting Plan. District Forest Officers and District Forest Manager offices are to be on the frontline of monitoring the Harvesting Plan. They have to ensure that harvesting of timber and charcoal is managed in accordance with approved Management and Harvesting Plans. The Plan provides that monitoring to be done at several levels.

4.1.1 VNRC roles and responsibilities in monitoring the plan

A Village Natural Resources Committee which is a sub-committee of the Village Council formed under the Environmental Management Act (EMA) No. 20 of 2004. The principal functions of the Natural Resources Committee are to oversee and manage the forest and harvesting of natural resource products, including forest products, from village forests, firewood, charcoal, trees, timber and poles. The Committee determines harvesting areas within the village forest and prepares and coordinates harvesting plans, and reviewing quarterly reports on harvesting activities with the Ward and DFOs. The VNRC and village leadership should monitor to ensure that timber and charcoal production in the un-reserved forests on village land is done in accordance with the District Harvesting Plan.

Frequent joint forest patrols involving Village Natural Resource Committee members from areas surrounding the forest and DFO/DFM should be conducted. Field physical surveillance should be conducted to ensure that harvesting rules are adhered to and that harvesting is done in such a way as to minimize its environmental impact. This can be realized if By-laws that ensure villages earn revenues from harvesting are in place. Part of such revenue should support VNRC activities including monitoring.

4.1.2 District Forest Manager roles and responsibilities in monitoring the plan

The DFM monitors harvesting to make sure that the harvesting is carried out according to the Plan in the specified areas and only trees shown on the license are harvested. The DFM is responsible for monitoring transportation of the forest products by making verifyign products against documents (e.g. TP, License, receipts etc) at Check Points and elsewhere. The DFM shall produce monthly, quarterly and annual reports showing amount of tree volume harvested and forest royalty collected.

4.1.3 District Forest Office roles and responsibilities in monitoring the plan

District forest office should construct forest products inspection checkpoints within the district and strengthen the capacity of available check points in order to realize the intended results. Most of the Kilosa District checkpoints are in fact established by District Councils for the purpose of collecting revenue from agriculture products. Jointing forest patrol involving different stakeholder from the district to the village level have to conduct regular patrol within the district to ensure harvesting activities comply with district harvesting plan.

4.1.4 District Forest Harvesting Committee roles and responsibilities in monitoring the plan

The District Forest Harvesting Committees have to conduct meetings every six months to discuss the harvesting trend as required by the National Harvesting guidelines of 2015.

4.2 Indicators

Indicators for monitoring and evaluations will include:

- Harvesting activities are based on the District Harvesting Plan and as approved by the villages, District Harvesting Committee and District Council.
- The actual timber and charcoal harvesting does not exceed allowable annual quota. The data for M& E will be annual allowable quota and actual harvest figures.
- Number of villages that have formulated by-laws to support sustainable harvesting of timber and charcoal from un-reserved forests on village land increased. The data for M&E will be the number of approved By-laws (previous years compared to current).
- Number and area of un-reserved forest on village land that are declared VLFR increased and revenues for villages improved. The data on number of VLFR will be collected from Kilosa District Annual Report.
- Mechanisms for sharing benefits are in place. Data on the number of by-laws formulated by villages to increase benefits and actual benefits received by villages as shown in Village Council Minutes.
- Revenue for local government (villages and district councils) increased. Data for M&E to be collected include: revenues from charcoal and timber harvesting for the villages and District Council.
- Degradation and deforestation due to timber and charcoal decrease in un-reserved forests on village land. Data for M&E to be collected include illegal felling of trees, size of areas cleared for agricultural expansion etc.
- Legal compliance by timber and charcoal producers in un-reserved forests on village land increased. Data for M&E to be collected include number of illegal activities within the un-reserved forest on village land.
- According to the National Forest Harvesting Guidelines of 2015, the Monitoring and Evaluation Report shall be prepared quarterly by the District Harvesting Committee and submitted to the District Council and TFS.

5) RECOMMENDATIONS

The following are key recommendations:

- The Kilosa District Councils should urgently review management objectives for Magubike South and Magubike North Forest Reserves, and prepare new management plans.
- The two District Council Forest Reserves (Magubike North and South) can be managed efficiently if Joint forest Management is introduced.
- The harvesting plan should be valid for 5 years and should be reviewed with updated information on forest areas and timber and charcoal stocks at that point.
- Kilosa District Council should ensure that harvesting in un-reserved forests on village land is done according to the Harvesting Plan, and customer should comply with the Plan.
- District Council should increase awareness to villages on Community Based Forest Management so as to declare more forest into village land forest reserves.
- The District should identify areas to be used as charcoal selling centers and establish them. Charcoal producers and traders should be encouraged to form associations.
- The Kilosa District Council and TFS should enhance their capacity to implement Harvesting Plan.
- Villages should develop by-laws to enable the villages to benefit from the timber and charcoal harvesting activities within their areas of jurisdictions.

6) REFERENCES

- Chidumayo, E.N. (1993). Responses of Miombo to harvesting: Ecology and management. Stockhom Environment Institute/Sida, Stockhom.
- Grundy, I.M. (1995) Regeneration and management of *Brachystegia spiciformis* and *Julbernardia globiflora* in Miombo woodlands of Zimbabwe, Unpublished PhD thesis, University of Oxford, Oxford
- KDC (2007). District Annual Development Report. District Council, Kilosa, Morogoro, Tanzania. 34pp.
- KDC (2012). Kilosa District Socio-economic profile. Jointly prepared by Institute of Rural Development Planning and Kilosa District Council, 76pp.
- KDC (2015a). Sheria Ndogo za Halmashauri (Mazao) za mwaka 2015. Halmashauri ya Wilaya ya Kilosa. 15 pp
- KDC (2015b). Mpango wa Uvunaji Mazao ya Misitu Wilaya ya Kilosa kwa mwaka 2015/16. Halmashauri ya Wilaya ya Kilosa. 12 pp
- Shackleton, C.M (2002). Growth patterns of *Pterocarpus angolensis* in savannas of the South African Lowveld. *For. Ecol. Manage.* 166: 85-97.
- Shishira, P.Z., Yanda E.K., Sosovele, H. and Lyimo, J.G. (1997). Kilosa District land use and natural resources assessment. Institute of Resource Assessment, University of Dar es Salaam, 89 pp.
- URT (1982). The Local Government (District Authorities) Act of 1982. Dar es Salaam, Tanzania, 127 pp.
- URT (1995). Reserved tree species in Tanzania. Government Notice No. 506 published on 15/9/1995. Ministry of Natural Resources and Tourism, The Forest Ordinance (CAP. 389), Order Made Under Section 17(1).
- URT (2002a). The Forest Act No. 14 of 2002. Ministry of Natural Resources and Tourism, Dar es Salaam, Tanzania, 127 pp.
- URT (2002b). The regulations of the Forest Act No. 14 of 2002. Ministry of Natural Resources and Tourism, Dar es Salaam, Tanzania, 119 pp.
- URT (2004). The Environmental Management Act of 2004. Dar es Salaam, Tanzania.
- URT (2013). Joint Forest Management Guidelines. Ministry of Natural Resources and Tourism, Dar es Salaam, Tanzania, 56 pp.
- URT (2014). Mwongozo wa uvunaji endelevu na biashara ya mazao ya misitu. Wizara ya Maliasili na Utalii, Dar es Salaam, Tanzania, 27 pp.
- von Maltitz, G.P., Rathogwa, N.R. (1999). Dynamics of *Pterocarpus angolensis* (Kiaat) in South Africa. CSIR Division of Forest Science and Technology, unpublished report.

ANNEXES

Annex 1. Kilosa District Agro ecological zone

Zone	Features of Zone	Average Annual rainfall (mm)	Altitude	Soil	Economic Activities
1.	Mountains and uplands. Mountain ranges running north-south are part of the Eastern Arc system and comprise pre-Cambrian metamorphic rocks covered by coarse soil	1,000mm - 1,600mm	1100m – 2200m	Well drained loamy soils	maize, beans, horticultural crops
2.	Medium altitude	800mm - 1,400mm	550 – 1,100m	Poorly drained black and loamy soils	Very popular in sugarcane, other crops include maize, rice, and sisal and onion cultivation.
3.	Central and southern flood plains of the Wami, Mkata and Ruaha rivers		400m - 550m	comprise poorly drained, black, 'cracking' clays	Mainly occupied by pastoralists (Maasai).

Source: Kilosa District Council's Office 2012

Annex 2. Distribution of population by ward and sex based on 2012 census

Serial No.	Ward/Shehia	Population (Number)			Average Household Size	Sex Ratio
		Total	Male	Female		
	Total	438,175	218,378	219,797	4.2	99
1	Mabula	7,168	3,511	3,657	5.1	96
2	Maguha	7,848	4,018	3,830	4.8	105
3	Berega	11,199	5,486	5,713	5.0	96
4	Magubike	10,274	5,125	5,149	4.9	100
5	Mamboya	28,710	14,312	14,398	5.2	99
6	Dumila	21,288	10,373	10,915	4.9	95
7	Magole	20,954	10,657	10,297	4.2	103
8	Msowero	29,361	14,899	14,462	4.4	103
9	Rudewa	18,352	9,078	9,274	4.3	98
10	Chanzulu	12,229	5,973	6,256	4.2	95
11	Kimamba A	6,079	2,986	3,093	3.5	97
12	Kimamba B	5,967	2,849	3,118	3.7	91
13	Mbumi	4,540	2,159	2,381	3.6	91
14	Mkwatani	12,428	5,866	6,562	4.1	89
15	Magomeni	11,998	5,834	6,164	3.9	95
16	Kasiki	5,459	2,762	2,697	3.9	102
17	Mabwerebwere	7,155	3,494	3,661	3.8	95
18	Kilangali	10,679	5,331	5,348	4.5	100
19	Mikumi	19,977	9,973	10,004	3.9	100
20	Ruhembe	15,198	7,578	7,620	3.7	99
21	Kidodi	9,106	4,429	4,677	3.6	95
22	Vidunda	11,698	5,973	5,725	4.3	104
23	Malolo	10,750	5,504	5,246	3.8	105
24	Kisanga	14,311	7,386	6,925	4.2	107
25	Uleling'ombe	4,095	2,067	2,028	5.0	102
26	Ulaya	17,354	8,833	8,521	4.0	104
27	Zombo	9,982	4,976	5,006	4.0	99
28	Lumuma	13,221	6,475	6,746	4.2	96
29	Masanze	7,890	4,059	3,831	4.0	106
30	Kidete	11,329	5,708	5,621	4.0	102
31	Lumbiji	6,891	3,504	3,387	5.3	103
32	Kitete	10,247	5,092	5,155	4.5	99
33	Madoto	3,570	1,757	1,813	4.0	97
34	Tindiga	13,291	6,513	6,778	3.8	96
35	Ruaha	27,577	13,838	13,739	3.9	101

Source: Census report, 2012

Annex 3. Roles and Responsibilities of stakeholders

Stakeholders	Role	Responsibilities
Local authority forest reserves		
DFO	Manager of the forests	<ul style="list-style-type: none"> • Prepare and Implement forest management plan • Prepare and Implement forest harvesting plan • Receive and compile harvesting applications and recommend to the District harvesting Committee • Issue harvesting licenses • Ensure law enforcement including harvesting compliances • Provide technical advice on harvesting of forest products • Collect revenues/fees associated with forest reserves • Develop draft bylaws on forest harvesting and present to DLNRO • Prepare monthly, quarterly and annual reports • Prepare annual budget for management and development of forest reserve • Implement monitoring, evaluation and reporting of forest activities • Keep records of all forest activities • Overseer of all activities inside forest reserves
District Land and Natural Resource Officer (DLNRO)	Head of Department	<ul style="list-style-type: none"> • Prepare reports on forest activities and present to the Council Management Team (CMT) • Present draft bylaws on forest harvesting to CMT • Prepare harvesting recommendations and present to the District Council Economic, Works and Environmental Committee • Provide technical advice to the District Council • Submit proposed budget to the relevant district council committees
District Economic, Works and Environmental Committee	Regulators	<ul style="list-style-type: none"> • Receive and recommend on forest harvesting plan • Make recommendations on harvesting of the forest • Submit recommendations on forest harvesting to the Full Council Meeting • Receive, discuss and recommend on draft bylaws on forest harvesting to Full Council Meeting
Full Council Meeting	Policy Makers	<ul style="list-style-type: none"> • Receive, discuss and make decisions on forest harvesting plan • Receive, discuss and approve forest bylaws
District Harvesting Committee	Decision makers on applications	<ul style="list-style-type: none"> • Receive and make decision on applications for harvesting forest products by dealers • Monitoring of implementation of harvesting plans and tree planting in harvested areas • Provide advice to the DED and TFS-CEO • Prepare quarterly reports on the progress of harvesting and tree planting in the district
Customer	Forest product dealers	<ul style="list-style-type: none"> • Comply with harvesting laws, bylaws, regulations and rules • Keep relevant documents and records on harvesting and trade of forest products
Un-reserved forests on village land		
VNRC	Local forest manager	<ul style="list-style-type: none"> • Patrol and supervision of forest harvesting within the village boundaries • Law enforcement • Prepare draft village bylaws regarding forest activities in un-reserved forests on village land including revenue collection and benefit sharing within the village • Receive, discuss and recommend harvesting applications to the Village Council • Prepare reports on forest activities • Initiate and follow-up the process for un-reserved forests on village land to become VLFRs • Hold a 'hammer' for timber harvested legally from a VLFR.
Village Council	Decision makers	<ul style="list-style-type: none"> • Prepare and submit quarterly report to the Village Assembly • Prepare draft of village bylaws and submit to the Village Assembly for approval • Select and recommend VNRC members to the Village Assembly for approval • Revenue collection from timber, firewood and charcoal • VEO and Chairman are members to the District Harvesting Committee
Village	Forest	<ul style="list-style-type: none"> • Overseer of all forest activities in the village

Stakeholders	Role	Responsibilities
Assembly	beneficiaries / forest owner	<ul style="list-style-type: none"> • Receive, discuss and make decisions on utilization of revenue from forest harvesting activities • Receive and approve village bylaws from the village council
DFO	Technical advisor	<ul style="list-style-type: none"> • Prepare and Implement forest harvesting plan • Provide technical advice on harvesting of forest products • Ensure law enforcement including harvesting compliances • Receive and compile harvesting applications and recommend to the District harvesting Committee • Develop draft bylaws on forest harvesting and present to DLNRO • Issue harvesting licenses • Revenue collection related to timber and charcoal harvesting • Keep records on timber and charcoal harvesting and trade • Implement monitoring, evaluation and reporting of forest activities • Member to the District Harvesting committee • Overseer of all forest activities
DFM	Technical advisor	<ul style="list-style-type: none"> • Issue forest harvesting application form • Registration of forest product dealers • Custodian of FD Hammer • Hammer all logs and timber in the un-reserved forests in the Districts • Issue and monitor TP to forest product dealers • Participate in preparation and Implementation of District Harvesting Plan • Provide technical advice on harvesting of forest products • Ensure law enforcement including harvesting compliances • Revenue collection related to Transport Pass for timber and charcoal • Implementation of monitoring, evaluation and reporting of forest activities • Overseer of all forest activities in un-reserved forests on village land • Member and Secretary to the District Harvesting committee • Keep records on TP for timber and charcoal
District Harvesting Committee	Decision makers on forest product harvesting applications	<ul style="list-style-type: none"> • Receive and make decision on applications for harvesting forest products by dealers • Monitoring of implementation of harvesting plans and tree planting in harvested areas • Provide advice to the DED and TFS-CEO • Prepare quarterly reports on the progress of harvesting and tree planting in the district •
Customer	Forest product dealers	<ul style="list-style-type: none"> • Comply with harvesting laws, bylaws, regulations and rules • Keep relevant documents and records on harvesting and trade of forest products

Annex 4. Potential sustainable annual harvest of common Miombo species on unreserved village and municipal sub-village land.

Village / Urban Ward	Area (ha)	Unreserved Woodland (ha)	Sustainable annual harvest (m ³)		
			Mtondoro	Myombo	Msani
Berega	3,118	21			
Chabi	6,823	1,351	34.04	34.09	32.40
Chabima	14,322	2,194	55.27	55.35	52.61
Dodoma Isanga	6,180	726	18.28	18.30	17.40
Dole	3,634	1,589	40.02	40.08	38.10
Dumba	3,317	121			
Dumbarumwe	3,668	65			
Dumila	4,566	1			
Ibindo	4,973	1,597	40.22	40.28	38.28
Ibingu	6,133	1,122	28.25	28.29	26.89
Idete	4,108	410	10.32	10.34	9.82
Ifunde	3,100	361	9.09	9.11	8.65
Ihombwe	19,357	3,310	83.36	83.49	79.35
Ilakala	1,103	263	6.62	6.63	6.30
Isanga Estate	6,137	635	15.99	16.02	15.22
Iyungwe	2,161	443	11.15	11.17	10.62
Jungwe	3,021	734	18.49	18.52	17.60
Kidete	13,289	7,414	186.71	186.99	177.72
Kiduhi	5,121	522	13.15	13.17	12.52
Kiegea	8,840	796	20.05	20.08	19.09
Kigunga	2,655	332	8.37	8.39	7.97
Kilangali	7,544	97			
Kilosa Urban Ward	31,973	18,395	463.28	463.98	440.97
Kisanga	19,071	548	13.81	13.83	13.14
Kisongwe	12,646	2,003	50.43	50.51	48.00
Kitange I	7,040	1,706	42.96	43.02	40.89
Kitange II	5,682	628	15.81	15.83	15.05
Kitati	2,828	10			
Kitunduweta	4,006	1,952	49.16	49.23	46.79
Kivungu	7,928	537	13.54	13.56	12.88
Kwambe	8,111	263	6.63	6.64	6.32
Lumbija	8,392	2,064	51.97	52.05	49.47
Lunenze	4,002	588	14.81	14.84	14.10
Lwemba	12,763	3,437	86.57	86.70	82.40
Mabula	2,275	66			
Machatu	3,892	15			
Madizini	3,462	1,498	37.73	37.79	35.92
Madoto	3,696	402			
Madudu	3,531	89			
Madudumizi	2,840	135			
Magubike	3,927	76			
Maguha	11,607	2,301	57.96	58.04	55.17
Mahedu	2,740	891	22.45	22.48	21.37

Village / Urban Ward	Area (ha)	Unreserved Woodland (ha)	Sustainable annual harvest (m ³)		
			Mtondoro	Myombo	Msani
Makwabe	12,856	8,311	209.32	209.63	199.24
Malolo A	29,819	387	9.75	9.76	9.28
Malolo B	22,433	5,492	138.31	138.52	131.65
Malui	2,386	16			
Mamboya	6,425	1,826	45.99	46.06	43.78
Mbamba	9,812	2,390	60.19	60.28	57.29
Mbili	4,217	145			
Mbwade	10,443	5,080			
Mfuluni	2,831	86			
Mgogozi	6,119	1,257	31.65	31.69	30.12
Mhenda	14,658	5,866	147.75	147.97	140.63
Mhowe	2,805	2,242	56.47	56.55	53.75
Mikumi Urban Ward	14,277	2,400	60.44	60.53	57.53
Mikundi	6,328	61			
Miwangani	2,675	17			
Mkuhulu	6,201	208	5.23	5.24	4.98
Mlunga	9,379	4,586	115.50	115.67	109.94
Mnozi	8,949	2,879	72.51	72.62	69.02
Msimba	36,397	2,220	55.90	55.99	53.21
Msolwa	2,833	485	12.21	12.22	11.62
Msowero	11,503	3,900	98.22	98.37	93.49
Msowero II	2,323	615	15.50	15.52	14.75
Mtega	8,693	1,206	30.37	30.42	28.91
Mtumbatu	9,279	843	21.22	21.25	20.20
Munisagara	5,143	3,651	91.96	92.10	87.53
Mvumi	7,325	2,965	74.66	74.78	71.07
Mwandi	5,819	261	6.57	6.58	6.25
Mwasa	8,633	1,250	31.48	31.53	29.97
Mzaganza	4,980	2,253	56.73	56.81	54.00
Nhebo	2,111	21			
Nyalanda	2,945	899	22.64	22.67	21.55
Nyali	9,286	444	11.17	11.19	10.63
Nyameni	5,787	1,042	26.25	26.29	24.99
Nyangala	9,802	6,556	165.11	165.36	157.16
Peapea	1,671	12			
Rudewa Gongoni	10,044	2,670	67.24	67.34	64.00
Rudewa Mbuyuni	3,222	121			
Tindiga	5,266	5			
Twatwatwa	39,905	10,705			
Ulaya Kibaoni	7,981	2,356	59.33	59.41	56.47
Ulaya Mbuyuni	5,316	430	10.82	10.84	10.30
Uleling'ombe	5,250	826	20.80	20.83	19.80
Unone	8,778	6,821	171.79	172.05	163.52
Uponela	8,542	3,863	97.28	97.42	92.59
Zombo	3,149	1,167	29.39	29.44	27.98
Total All Jurisdictions	700,177	162,541	3,656	3,662	3,480

Annex 5. Potential sustainable annual harvest of less common Miombo and other woodland species on unreserved village and municipal sub-village land.

Village / Urban Ward	Area (ha)	Unreserved Woodland (ha)	Sustainable annual harvest (m ³)							
			Mpingo	Mnyenye	Mgelegele	Mkambaa	Mng'ongo	Mlama	Mwanga	Msolo
Berega	3,118	21								
Chabi	6,823	1,351	2.43	8.76	13.77	6.49	5.72	0.60	2.67	1.95
Chabima	14,322	2,194	3.94	14.22	22.36	10.53	9.29	0.97	4.33	3.16
Dodoma Isanga	6,180	726	1.30	4.70	7.39	3.48	3.07	0.32	1.43	1.05
Dole	3,634	1,589	2.85	10.30	16.19	7.63	6.73	0.70	3.13	2.29
Dumba	3,317	121								
Dumbarumwe	3,668	65								
Dumila	4,566	1								
Ibindo	4,973	1,597	2.87	10.34	16.27	7.66	6.76	0.70	3.15	2.30
Ibingu	6,133	1,122	2.01	7.27	11.43	5.38	4.75	0.50	2.21	1.62
Idete	4,108	410	0.74	2.65	4.17	1.97	1.73	0.18	0.81	0.59
Ifunde	3,100	361	0.65	2.34	3.68	1.73	1.53	0.16	0.71	0.52
Ihombwe	19,357	3,310	5.94	21.44	33.72	15.88	14.01	1.46	6.53	4.77
Ilakala	1,103	263	0.47	1.70	2.68	1.26	1.11	0.12	0.52	0.38
Isanga Estate	6,137	635	1.14	4.11	6.47	3.05	2.69	0.28	1.25	0.92
Iyungwe	2,161	443	0.80	2.87	4.51	2.13	1.87	0.20	0.87	0.64
Jungwe	3,021	734	1.32	4.76	7.48	3.52	3.11	0.32	1.45	1.06
Kidete	13,289	7,414	13.31	48.03	75.53	35.58	31.38	3.27	14.62	10.68
Kiduhi	5,121	522	0.94	3.38	5.32	2.51	2.21	0.23	1.03	0.75
Kiegea	8,840	796	1.43	5.16	8.11	3.82	3.37	0.35	1.57	1.15
Kigunga	2,655	332	0.60	2.15	3.39	1.60	1.41	0.15	0.66	0.48
Kilangali	7,544	97								
Kilosa Urban Ward	31,973	18,395	33.03	119.17	187.40	88.28	77.86	8.12	36.29	26.51
Kisanga	19,071	548	0.98	3.55	5.59	2.63	2.32	0.24	1.08	0.79
Kisongwe	12,646	2,003	3.60	12.97	20.40	9.61	8.48	0.88	3.95	2.89
Kitange I	7,040	1,706	3.06	11.05	17.38	8.19	7.22	0.75	3.36	2.46

Village / Urban Ward	Area (ha)	Unreserved Woodland (ha)	Sustainable annual harvest (m ³)							
			Mpingo	Mnyenye	Mgelegele	Mkambaa	Mng'ongo	Mlama	Mwanga	Msolo
Kitange II	5,682	628	1.13	4.07	6.40	3.01	2.66	0.28	1.24	0.90
Kitati	2,828	10								
Kitunduweta	4,006	1,952	3.50	12.65	19.89	9.37	8.26	0.86	3.85	2.81
Kivungu	7,928	537	0.97	3.48	5.48	2.58	2.28	0.24	1.06	0.77
Kwambe	8,111	263	0.47	1.71	2.68	1.26	1.12	0.12	0.52	0.38
Lumbija	8,392	2,064	3.71	13.37	21.02	9.90	8.73	0.91	4.07	2.97
Lunenze	4,002	588	1.06	3.81	5.99	2.82	2.49	0.26	1.16	0.85
Lwemba	12,763	3,437	6.17	22.27	35.02	16.50	14.55	1.52	6.78	4.95
Mabula	2,275	66								
Machatu	3,892	15								
Madizini	3,462	1,498	2.69	9.71	15.26	7.19	6.34	0.66	2.96	2.16
Madoto	3,696	402	0.72			1.93				
Madudu	3,531	89								
Madudumizi	2,840	135								
Magubike	3,927	76								
Maguha	11,607	2,301	4.13	14.91	23.44	11.04	9.74	1.02	4.54	3.32
Mahedu	2,740	891	1.60	5.77	9.08	4.28	3.77	0.39	1.76	1.28
Makwabe	12,856	8,311	14.92	53.84	84.67	39.88	35.18	3.67	16.40	11.98
Malolo A	29,819	387	0.69	2.51	3.94	1.86	1.64	0.17	0.76	0.56
Malolo B	22,433	5,492	9.86	35.58	55.95	26.35	23.25	2.42	10.83	7.92
Malui	2,386	16								
Mamboya	6,425	1,826	3.28	11.83	18.60	8.76	7.73	0.81	3.60	2.63
Mbamba	9,812	2,390	4.29	15.48	24.35	11.47	10.12	1.05	4.71	3.44
Mbili	4,217	145								
Mbwade	10,443	5,080	9.12			24.38				
Mfuluni	2,831	86								
Mgogozi	6,119	1,257	2.26	8.14	12.80	6.03	5.32	0.55	2.48	1.81

Village / Urban Ward	Area (ha)	Unreserved Woodland (ha)	Sustainable annual harvest (m ³)							
			Mpingo	Mnyenye	Mgelegele	Mkambaa	Mng'ongo	Mlama	Mwanga	Msolo
Mhenda	14,658	5,866	10.53	38.01	59.76	28.15	24.83	2.59	11.57	8.45
Mhowe	2,805	2,242	4.03	14.53	22.84	10.76	9.49	0.99	4.42	3.23
Mikumi Urban Ward	14,277	2,400	4.31	15.55	24.45	11.52	10.16	1.06	4.73	3.46
Mikundi	6,328	61								
Miwangani	2,675	17								
Mkuhulu	6,201	208	0.37	1.35	2.12	1.00	0.88	0.09	0.41	0.30
Mlunga	9,379	4,586	8.23	29.71	46.72	22.01	19.41	2.02	9.05	6.61
Mnozi	8,949	2,879	5.17	18.65	29.33	13.82	12.19	1.27	5.68	4.15
Msimba	36,397	2,220	3.99	14.38	22.61	10.65	9.40	0.98	4.38	3.20
Msolwa	2,833	485	0.87	3.14	4.94	2.33	2.05	0.21	0.96	0.70
Msowero	11,503	3,900	7.00	25.27	39.73	18.72	16.51	1.72	7.69	5.62
Msowero II	2,323	615	1.11	3.99	6.27	2.95	2.61	0.27	1.21	0.89
Mtega	8,693	1,206	2.17	7.81	12.29	5.79	5.10	0.53	2.38	1.74
Mtumbatu	9,279	843	1.51	5.46	8.58	4.04	3.57	0.37	1.66	1.21
Munisagara	5,143	3,651	6.56	23.66	37.20	17.52	15.46	1.61	7.20	5.26
Mvumi	7,325	2,965	5.32	19.21	30.20	14.23	12.55	1.31	5.85	4.27
Mwandi	5,819	261	0.47	1.69	2.66	1.25	1.10	0.12	0.51	0.38
Mwasa	8,633	1,250	2.24	8.10	12.73	6.00	5.29	0.55	2.47	1.80
Mzaganza	4,980	2,253	4.04	14.59	22.95	10.81	9.53	0.99	4.44	3.25
Nhebo	2,111	21								
Nyalanda	2,945	899	1.61	5.82	9.16	4.31	3.80	0.40	1.77	1.30
Nyali	9,286	444	0.80	2.87	4.52	2.13	1.88	0.20	0.87	0.64
Nyameni	5,787	1,042	1.87	6.75	10.62	5.00	4.41	0.46	2.06	1.50
Nyangala	9,802	6,556	11.77	42.47	66.79	31.46	27.75	2.89	12.93	9.45
Peapea	1,671	12								
Rudewa Gongoni	10,044	2,670	4.79	17.30	27.20	12.81	11.30	1.18	5.27	3.85
Rudewa Mbuyuni	3,222	121								

Village / Urban Ward	Area (ha)	Unreserved Woodland (ha)	Sustainable annual harvest (m ³)							
			Mpingo	Mnyenye	Mgelegele	Mkambaa	Mng'ongo	Mlama	Mwanga	Msolo
Tindiga	5,266	5								
Twatwatwa	39,905	10,705	19.22			51.37				
Ulaya Kibaoni	7,981	2,356	4.23	15.26	24.00	11.30	9.97	1.04	4.65	3.39
Ulaya Mbuyuni	5,316	430	0.77	2.78	4.38	2.06	1.82	0.19	0.85	0.62
Uleling'ombe	5,250	826	1.48	5.35	8.41	3.96	3.50	0.36	1.63	1.19
Unone	8,778	6,821	12.25	44.19	69.49	32.73	28.87	3.01	13.46	9.83
Uponela	8,542	3,863	6.94	25.02	39.35	18.54	16.35	1.70	7.62	5.57
Zombo	3,149	1,167	2.10	7.56	11.89	5.60	4.94	0.52	2.30	1.68
Total All Jurisdictions	700,177	162,541	289.73	940.53	1478.96	774.36	614.51	64.07	286.39	209.23

Annex 6. Potential sustainable annual harvest of charcoal on unreserved village and municipal sub-village land.

Village / Municipal Ward	Area (ha)	Unreserved Woodland or Tall Thicket (ha)	Charcoal Limit (tons)
Berega	3,118	18	1.03
Chabi	6,823	2,996	174.77
Chabima	14,322	1,987	115.91
Dodoma Isanga	6,180	700	40.85
Dole	3,634	1,460	85.18
Dumba	3,317	150	8.73
Dumbarumwe	3,668	63	3.65
Dumila	4,566	1	0.06
Ibindo	4,973	1,528	89.12
Ibingu	6,133	1,017	59.31
Idete	4,108	293	17.08
Ifunde	3,100	357	20.82
Ihombwe	19,357	3,285	191.61
Ilakala	1,103	262	15.29
Isanga Estate	6,137	637	37.16
Iyungwe	2,161	450	26.26
Jungwe	3,021	451	26.30
Kidete	13,289	5,846	341.00
Kiduhi	5,121	522	30.46
Kiegea	8,840	533	31.07
Kigunga	2,655	332	19.38
Kilangali	7,544	98	5.71
Kilosa Ward sub-villages	31,973	13,589	792.72
Kisanga	19,071	520	30.33
Kisongwe	12,646	1,635	95.40
Kitange I	7,040	1,358	79.19
Kitange II	5,682	328	19.15
Kitati	2,828	625	36.48
Kitunduweta	4,006	1,840	107.36
Kivungu	7,928	537	31.35
Kwambe	8,111	268	15.61
Lumbija	8,392	1,432	83.51
Lunenze	4,002	521	30.42
Lwemba	12,763	4,148	241.94
Mabula	2,275	67	3.92
Machatu	3,892	14	0.85
Madizini	3,462	1,400	81.66
Madoto	3,696	402	23.46
Madudu	3,531	88	5.16
Madudumizi	2,840	130	7.60
Magubike	3,927	74	4.31
Maguha	11,607	2,108	122.96
Mahedu	2,740	883	51.49
Makwabe	12,856	6,965	406.28

Village / Municipal Ward	Area (ha)	Unreserved Woodland or Tall Thicket (ha)	Charcoal Limit (tons)
Malolo A	29,819	1,078	62.86
Malolo B	22,433	9,091	530.32
Malui	2,386	16	0.95
Mamboya	6,425	1,718	100.21
Mbamba	9,812	2,366	138.01
Mbili	4,217	133	7.75
Mbwade	10,443	5,080	296.31
Mfuluni	2,831	75	4.39
Mgogozi	6,119	3,026	176.53
Mhenda	14,658	5,775	336.87
Mhowe	2,805	1,875	109.39
Mikumi Ward Subvillages	14,277	2,202	128.47
Mikundi	6,328	61	3.58
Miwangani	2,675	17	1.02
Mkuhulu	6,201	786	45.86
Mlunga	9,379	3,858	225.07
Mnozi	8,949	2,008	117.16
Msimba	36,397	1,972	115.04
Msolwa	2,833	439	25.58
Msowero	11,503	3,294	192.18
Msowero II	2,323	590	34.44
Mtega	8,693	1,044	60.89
Mtumbatu	9,279	714	41.64
Munisagara	5,143	2,705	157.77
Mvumi	7,325	2,758	160.90
Mwandi	5,819	243	14.20
Mwasa	8,633	5,476	319.43
Mzaganza	4,980	2,468	143.94
Nhebo	2,111	21	1.24
Nyalanda	2,945	899	52.42
Nyali	9,286	433	25.24
Nyameni	5,787	1,021	59.54
Nyangala	9,802	5,616	327.58
Peapea	1,671	12	0.72
Rudewa Gongoni	10,044	2,618	152.70
Rudewa Mbuyuni	3,222	121	7.03
Tindiga	5,266	5	0.27
Twatwatwa	39,905	10,705	624.47
Ulaya Kibaoni	7,981	2,353	137.24
Ulaya Mbuyuni	5,316	430	25.07
Uleling'ombe	5,250	606	35.34
Unone	8,778	6,313	368.25
Uponela	8,542	3,105	181.15
Zombo	3,149	1,161	67.71
Total	700,177	158,206	9,229

Annex 7. List of Forest Reserves in Kilosa District

Forest Reserve	JB	Ownership	Productive (ha)	Protective (ha)	GN No. and Date of Gazettement	Variation GN No	Revocation G.N.No.	Remarks	TT	LA
Baga/Kwaju hill		T.T		499.8	sch		138/29/3/1963		500	0
Ikwamba	528	T.T		889	231/22/6/1962	153/1/1991			889	0
Kihiriri	576	T.T		208	sch				208	0
Govu hill		T.T		499.8	sch				500	0
Mamboto	530	T.T		148.9	233/22/6/1962	370 of 1963/15/151/1991			149	0
Mamboya	2081	T.T		203.6	cap. 132 p.1360	348 of 1961			204	0
Mamiwa kisara north	2097	T.T		8,203	cap.132 p.1360				8,203	0
Mamiwa kisara south	112	T.T		6,266.40	250/26/10/1951				6,266	0
Matwiga	1036	T.T	663.7		sch				664	0
Milindo	507	T.T	3,087.10		64/23/3/1950	370 of 1963			3,087	0
Milindo extension	586	T.T	575.5		252/28/6/1968				576	0
Pala mountains	512	T.T		10,610.30	218/23/6/1961				10,610	0
Magubike north	2174	L.A		9,599.00				Proposed	0	9,599
Magubike south	2175	L.A		15,055.00				Proposed	0	15,055
sima	91	T.T		299.9	sch 1912				300	0
Talagwe	573	T.T		1,085.40	sup.59 cap.189	139/28/3/1963			1,085	0
Ukwiva	180	T.T		54,634.50	407/3/12/1954				54,635	0
Uponera	2083	T.T		375.1	232/22/6/1962				375	0
Total									88,250	24,654