



# **Vegetation surveys in Rungwa Corridor 2020 / 2021**

**Final report**



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**Front page: Monospecific stand of *Brachystegia spp.*, Rungwa River Forest Reserve**

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## Abbreviations

ADAP	Association for the Development of Protected Areas
ba	Basal area
BKZ	Beekeeping Zone
DBH	Diameter at Breast Height
DFO	District Forest Officer
FR	Forest Reserve
GR	Game Reserve
PCQM	Point-Centered Quarter Method
TANRIC	Tanzania Resource Information Center
TFS	Tanzania Forest Services Agency
VGS	Village Game Scout

## Abstract

A vegetation survey of Kululu Community Forest Reserve and Rungwa River Forest Reserve was carried in October 2020 and January/February 2021. The objective of the survey was to assess the current state of the vegetation of Kululu Community Forest Reserve and Rungwa River FR and its current threats to establish a baseline for the management and monitoring of the area.

A transect method based on the Point-Centered Quarter (PCQM), a plotless method, and the assessment of human disturbances along the transects was applied. The PCQM allows the assessment of tree species richness, tree density, diameter class diameter distribution for each species, absolute frequency, and basal area and dominance of each tree species.

In total six transects were outlined, three in Kululu Community Forest Reserve and three in Rungwa River FR with an overall length of 51.1 km. In total 164 sampling points were analysed including 420 trees of the larger diameter class ( $\geq 20$  cm) and 655 trees/shrubs of the lower diameter class ( $< 20$  cm) considering quarters with no trees.

*Julbernardia globiflora* a characteristic, widespread and often dominating species of many miombo woodlands, is the most frequent species in both protected areas followed by *Brachystegia spiciformis*. The understoreys are widely dominated by *Diplorhynchus condylocarpon*. The low abundance of saplings in general is probably typical for miombo trees where natural regeneration is poor and sparsely because of poor seedling survival during establishment mainly due to recurrent fires and browsing.

The total alpha-diversity for both protected areas is 37 trees in the larger diameter class and 59 trees/shrubs in the lower diameter class. Based on all vegetation surveys conducted in the protected areas of Mlele and Sikonge districts, 151 trees/shrubs have been recorded with their scientific and vernacular names.

Tree density in the larger diameter class, total basal area and estimated tree height are significantly higher in Kululu Community Forest Reserve than in Rungwa River FR. Consequently the total standing volume for Kululu Community Forest Reserve varies between 37 and 50 m<sup>3</sup> compared to 14 to 30 m<sup>3</sup> in Rungwa River FR. The PCQM is a very suitable method for more or less closed woodland stands but has its limits in more open areas with many quarters with no trees what requires the use of a correction factor.

Tree debarking for producing bee hives, timber logging and tree cutting for harvesting wild honey were the prevalent disturbances. Since we assume that many human disturbances have been overlooked during the second survey in the wet season, the concerned sections of the transects have to be reassessed during the dry season for having reliable data for the planned scientific article on the current state of the vegetation of the miombo woodlands within the Rungwa and Katavi – Ugalla corridors.

Detailed vegetation maps showing the different vegetation types and land use in the project areas would be a very useful tool for the management and the monitoring of the area. Such maps would also allow to spatially stratify the project area with well-defined units which could support other studies in future.



## 1) Introduction

The Association for the Development of Protected Areas (ADAP) is implementing the project entitled *Community forest management of the Rungwa corridor* in Mlele district (Katavi region) and Sikonge district (Tabora region) in western Tanzania. The Rungwa ecological corridor is composed of a dense network of protected areas. The first phase of the Rungwa corridor project lasted from April 2018 to February 2021 including a ten months no-cost extension.

The Rungwa corridor project aims to ensure the conservation of the Rungwa-Katavi ecological corridor (Ushoroba) by closely involving the local communities in the forest management through forest protection and patrol. In return for these efforts, the participating villages receive a range of concrete benefits, such as rights to harvest forest products, share revenue from forest harvesting, retain fines as well as confiscated materials/produce, use local water sources and so on (Forestry and Beekeeping Division 2007, 2013).

Sustainable community-based forest management will improve the livelihoods of the locals through the development of income generating activities such as beekeeping and promoting and marketing of wild edible mushrooms thereby inciting the local population for the conservation of the miombo ecosystems.

The project area includes (see Fig. 2):

- a) the villages of Kapumpa, Mwitikio and Majojoro and the nearby Kululu Community Forest Reserve (880 km<sup>2</sup>) in Sikonge district;
- b) the villages of Isegenezya and Ilunde and the adjacent Rungwa River FR<sup>1</sup> (2300 km<sup>2</sup>) in Mlele and Sikonge districts;
- c) the villages of Mgambo, Mwenge, Mkola and the nearby forests along Rungwa River on open area in Sikonge district (not surveyed during this mission).

Knowing the current state of a forest ecosystem (baseline) is a prerequisite for any sustainable management. Therefore, ADAP has mandated Adansonia-Consulting to conduct a vegetation survey of Rungwa River FR and Kululu Community Forest Reserve. A similar vegetation survey was carried out by Bloesch (2019) in Mlele Beekeeping Zone (BKZ) using the same transect method based on the Point-Centered Quarter Method (PCQM) and the assessment of human disturbances along the transects. More specifically, Adansonia-Consulting was mandated with the following tasks:

- Assess the current state (baseline) of the vegetation of Kululu Community Forest Reserve and Rungwa River FR and its current threats.
- Assess the following forest parameters along transects using the PCQM method (Mueller-Dombois, & Ellenberg 1974, Mitchell 2007):
  - Tree species richness;
  - Tree density;
  - For each tree species its diameter class diameter distribution;
  - Absolute frequency of each tree species;
  - Basal area and dominance of each tree species.
- Record all human ecosystem disturbances along the transects.
- Make recommendations for the monitoring by VGSs under the supervision of the livelihood and natural resources officer of the projet (sampling method, monitoring sheets, frequency, etc.).

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<sup>1</sup> Please note that Rungwa River Forest Reserve is currently in the process of a new demarcation for its northern boundaries.

The mission to Tanzania was conducted from 4 to 18 October 2020. The field survey to Kululu Community Forest Reserve (including the sectors of Kapumpa, Mwitikio and Majojoro villages) and Rungwa River FR was carried from 7 to 10 October and from 12 to 15 October, respectively.

The field team for this first survey was composed of:

Dr. Urs Bloesch, international consultant;  
Matana Levi, ADAP livelihood and natural resources officer;  
Fredy Masanja, DFO Sikonge district (only Kululu Community Forest Reserve);  
Paulo Rugola Benedicto, Tanzania Forest Services Agency (TFS) from Mlele District (only Rungwa River Forest Reserve);  
Dicksoni Malembeka, VGS Inyonga;  
Isaya Godfrey Sungura, VGS Majojoro;  
Gabinus Tandika, ADAP project driver;  
Alex Bloesch, student apprentice.

A preliminary report was elaborated by Bloesch (2020). The transects were then later completed by a second survey led by Matana Levi in Kululu Community Forest Reserve (24 January to 3 February 2021) and Rungwa River FR (14 to 23 February 2021) to obtain finally three transects in both protected areas. The transect methodology and the preliminary results of the vegetation assessment were discussed on 30 June 2021 during a forest inventory workshop organised in Tabora with TFS (see Fig. 1).

This final report presents the overall analysis of the state of the vegetation and the human disturbances of Kululu Community Forest Reserve and Rungwa River FR based on the six transects. The data will be further analysed and discussed in a first publication on the miombo woodlands of the Rungwa and Katavi – Ugalla corridors considering the ongoing vegetation survey in Mulele Hills FR.



**Fig. 1.** Forest inventory workshop organised by ADAP-TFS in Tabora on 30 June 2021.



## 2) Study area

Miombo woodland is the dominating vegetation type of unimodal rainfall areas in southeastern Africa (Smith & Allen 2004) and is also the most extensive vegetation type in Tanzania (Shirima et al. 2014). The extensive area of miombo woodlands plays an important role as carbon source and sink at global level. Miombo woodlands are frequently burnt and characterized by a distinct and often continuous grass layer and open to closed tree canopies. Miombo are dominated by the genera *Brachystegia* and *Julbernardia* with *Brachystegia spiciformis* and *Julbernardia globiflora* as the most common tree species (Frost 1996, Campbell 1996).

Usually a floristically rich “wetter miombo” of the higher rainfall areas (>1000 mm per annum) is distinguished from floristically more poor “drier miombo” (<1000 mm per annum) based on differences in climate conditions. The miombo type of the study area is transitional between “drier” and “wetter” miombo with an average annual rainfall estimated to oscillate between 900 and 1100 mm (extrapolated from Inyonga climate diagram from climate-data.org 2022); Rungwa River FR is slightly drier what is indicated by the more widespread genera *Acacia* and especially *Combretum* and the occurrence of the candelabra tree (*Euphorbia candelabrum*).

Miombo woodlands have a low soil nutrient content, are well drained, highly leached, acidic and low in organic matter (Frost 1996). The timber and non-timber products from the miombo woodlands are essential for the livelihoods of millions of people living inside and outside the miombo woodlands (Campbell 1996, Malaisse 1997).

Kululu Community Forest Reserve is located in Sikonge district. The permanent Kululu river demarcates the northern boundary to the adjacent Itulu Hills FR (see Fig. 2) while in the west the main road from Ipole to Rungwa marks the boundary with Inyonga FR. Open land is bordering to the south. The topography is predominately flat and drained to the west. The altitude ranges between 1170 and 1260 m a.s.l. with two hills reaching about 1400 m a.s.l.

Rungwa River FR is located in Mlele and Sikonge districts. Mlele and Inyonga FRs, interrupted by the open areas of Isegenezya and Ilunde villages are delimitating Rungwa River FR in the north while Rukwa, Lukwati, and Piti Game Reserves (GR) are bordering Rungwa River FR from west over south to east including an open area in the far east (see Fig. 2). The topography is predominately flat and drained southwards to the Rungwa River. The altitude ranges between 1080 m and 1230 m a.s.l.

Miombo woodlands are the predominating vegetation type in both protected areas covering more than 80% (estimated from the land use maps from the Tanzania Resource Information Center, TANRIC) interspersed with many mbugas (open grasslands usually flooded during the rainy season). The seasonally waterlogged mbugas are mainly covered with grasslands and occasionally a few trees and shrubs may occur (wooded grasslands). Narrow riverine forests occur along the permanent Rungwa and Kululu rivers. Towards Rungwa River quite extensive open shrub savannas exist, predominately composed of *Combretum fragrans*, *Bauhinia petersiana*, *Terminaria mollis* and *Acacia drepanolobium*.

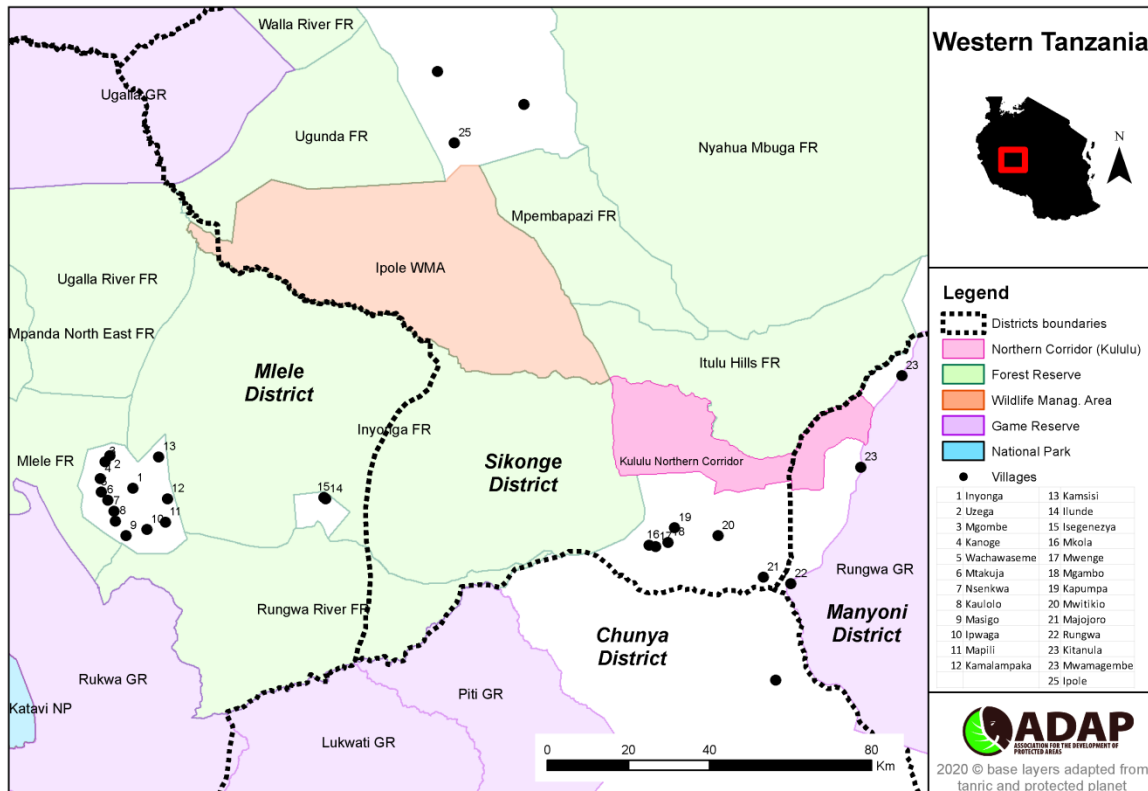


Fig. 2. Project area of the Rungwa Corridor Project.

### 3) Methods

#### 3.1 Data collection

The state of vegetation and their human disturbances were assessed focussing on miombo vegetation thereby excluding larger mbugas. The vegetation map from TANRIC was used to prelocate transects considering access constraints for the field survey. In addition, in Kululu Community Forest Reserve we climbed some hills for having a lookout on the landscape and the state of the vegetation to better locate our transects (see Fig. 3).

Finally, three transects in Kululu Community Forest Reserve and three transects in Rungwa River FR were outlined with a selected azimuth either of 180° or 360° (see Appendix D and E) and a total length of the transects of 51.1 km (90 sampling points in Kululu village forest and 89 sampling points in Rungwa River FR). Whenever encountered a mbuga we skipped the points in open vegetation until we reached again miombo vegetation or in the case of an extensive mbuga we relocated the transect at a parallel distance of hundred meters (if necessary adding further 50m, i.e. 150 m, 200 m...). The same principle was applied if the sampling point hit a major disturbance such as a large termite mound.

#### Current state of the vegetation

Along transects the Point-Centered Quarter Method (PCQM), a plotless method, was used to assess the state of the vegetation (Mueller-Dombois, & Ellenberg 1974, Mitchell 2007). Four quarters were established at the sampling point through a right angled cross formed by two

lines (sticks laid out on the ground). One line was then selected at the compass direction (180° or 360°) and the other running perpendicular to the compass direction through the sampling point. The distance to the mid-point of the nearest tree for two different diameter classes (see below) from the sampling point was measured in each quarter (see Fig. 4). If a quarter had no tree within a distance of 20 m then we noted *no tree*. The interval between two sampling points has been set systematically at 300 steps measured always by the same person.



**Fig. 3.** Lookout on the western part of Kululu Community Forest Reserve (Kapumpa area).

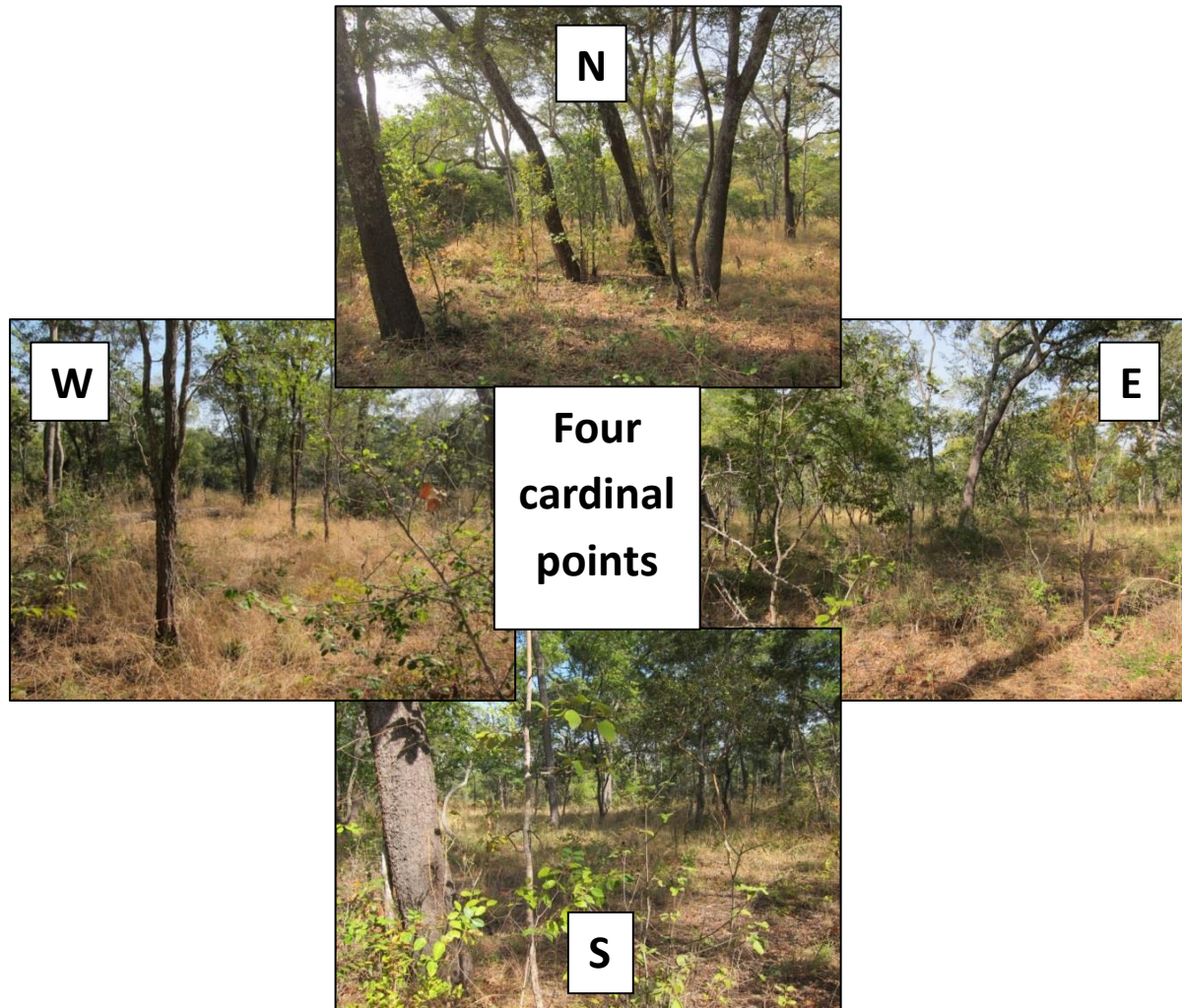
We used a handheld Garmin GPS to record the coordinates of each sampling point. All tree/shrub species and their diameter at breast height (DBH) were recorded separately for two size categories: larger trees (DBH  $\geq$  20 cm) and smaller trees/shrubs ( $3 \geq$  DBH < 20 cm) using a diameter tape measure (Richter, Germany). If a multi-stem tree was recorded in the larger diameter size class, then its stems falling under the lower diameter size class were not considered.

The heights of the dominant trees were estimated visually (ocular estimation) using a levelling rod of 2 m height as a reference at the base of a tree trunk. Slope and slope exposure were determined with a Büchi compass (P3252). Each direction of the cross marking the four quarters was systematically photographed from the sampling point (Canon powershot S95) resulting in 240 photographs (see example in Fig. 5, only for the first vegetation survey). The data for each sampling point of Kululu Community Forest Reserve and Rungwa River FR are given in Appendix A and B, respectively.





**Fig. 4.** PCQM method: Distance to the mid-point of the nearest tree from the sampling point in each quarter is measured recording tree species and diameter (photograph from Mlele BKZ survey, see Bloesch 2019).



**Fig. 5.** Visual illustration of the site at the sampling using four photographs from the sampling point in each cardinal direction (photographs from the Mlele Beekeeping Zone survey see Bloesch 2019).

The PCQM method allowed assessing the following forest parameters (Mueller-Dombois & Ellenberg 1974):

- Tree species richness;
- Density (from mean distance);
- For each tree its diameter class diameter distribution;
- Absolute frequency (as the occurrence of a species at a sampling point);
- Basal area (ba) and dominance for each species.

The tree basal area<sup>2</sup> of the surrounding stand was also estimated additionally in a simple but efficient way using the Bitterlich method (1948). The Bitterlich method counts trees (shrubs) in an open circle around the sampling point using an angle-gauge. Therefore, a wooden stick of 50 cm length with a fixed small metal sheet with four angular widths at its end was used. Only trees (shrubs) stems having a DBH larger than the smallest angular width (appropriate angular width for miombo woodlands) with a counting factor of  $k = 1$  were included in the count.

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<sup>2</sup> Tree basal area is the cross-sectional area (over the bark) at breast height (1.3 metres above the ground) measured in square meters.



Please note that sampling points in open areas (mbugas) were not considered in the analysis of miombo woodland vegetation (see Table 1 and 2 below). The sampling points for the lower tree class ( $\varnothing < 20\text{cm}$ ) in open areas from the transects RT1 and RT2 in Rungwa River FR only were analysed separately as savanna vegetation while the few isolated larger trees ( $\varnothing \geq 20\text{cm}$ ) were not further analysed.

A short video was recorded which shows briefly the different steps of the transect method to survey the vegetation (see <https://www.adap.ch/en/forest-management-in-mlele-bkz-which-results/> )

### **Human ecosystem disturbances**

All human disturbances were recorded by two persons walking opposite and parallel to the transect keeping a distance of 20 m from the transect. Each person recorded all disturbances on his side covering a sampling width of 40 m (20 meters each on his left and right along the walking direction) resulting in a total sampling width (belt transect) of 80 m. Disturbances could include logging (saw pits, stumps), tree barking (for bee hives, ropes), trapping, infrastructures (camps), encroachments, and grazing by cattle. Fire signs were not recorded since most of the miombo woodlands are burnt annually.

## **3.2 Data analysis**

If plants could not be identified in the field with certainty, voucher specimens were collected and later identified with the support of Frank Mbago, a botanist from the herbarium of the University of Dar es Salaam. The plant check list from Mlele Beekeeping Zone (Bloesch 2019) was completed by the new species found during this vegetation survey (see Appendix C).

### **Calculation of forest parameters**

**Species richness:** alpha-diversity, i.e. number of species in a given community

**Tree density:**  $\text{area} / D^2$

where D is the mean distance from all trees in each quarter to the center.

The tree density/ha was corrected for transects having quarters with no tree using the correction factor (CF) from Warde & Petranka (1981). CF is defined as a function of total number of vacant quarters / total number of quarters.

**Basal area:**  $d^2\pi / 4$

where d is the DBH.

**Absolute frequency** i.e., the occurrence of a species at the sampling points was calculated as follows:

$(N \text{ points with species} / \text{total points}) \times 100$

**Species dominance:** mean ba x number of species per ha.

## 4) Results

### 4.1 Vegetation data

Length and number of sampling points per transect are given in Table 1 below (see also map in Appendix D and E). The last column gives the number of sampling points effectively analysed since some points hit open areas (mbugas). Only for the Rungwa River FR transects RT1 and RT2 sampling points in mbugas (28) were analysed separately as own vegetation type (savanna, open vegetation) and only for the lower diameter class ( $\varnothing < 20\text{cm}$ ).

**Table 1: Transect characteristics in Kululu Community Forest Reserve and Rungwa River FR**

Transect	Length (m)	Sampling points (N)	Sampling points (N) analysed
<b>Kululu Community FR</b>			
KT1	8,723	30	29
KT2	8,780	30	23
KT3	8,738	30	28
<b>Rungwa River FR</b>			
RT1	7,998	35	35 (20 only $\varnothing < 20\text{cm}$ )
RT2	8,200	30	29 (8 only $\varnothing < 20\text{cm}$ )
RT3	8,715	24	20
<b>Total</b>	<b>51,154</b>	<b>179</b>	<b>164</b>

The forest parameters determined by the PCQM for both diameter classes of all transects are given in Table 2 below including tree/shrub density and mean basal area (PCQM and Bitterlich). The mean tree height is derived from the estimated dominant tree height observed in the field. The standing volume was calculated as product from mean basal area determined by PCQM, mean tree height and a mean conservative tree coefficient of 0.5.

**Table 2: Forest parameters for Kululu Community FR and Rungwa River FR**

Location / diameter class (N° points)	Tree/shrub density/ha	Mean basal area/ha PCQM (m <sup>2</sup> )	Mean basal area/ha Bitterlich(m <sup>2</sup> )	Dominant / mean tree height (m)	Estimated standing vol./ha (m <sup>3</sup> )
Kululu Miombo KT1 Ø ≥ 20cm (29)	77.75	6.24	9.09	15.6 / 13	40.6
Kululu Miombo KT1 Ø < 20cm (29)	425.17	2.97		6	8.9
Kululu Miombo KT2 Ø ≥ 20cm (23)	54.58	5.20	6.43	15.2 / 13	33.8
Kululu Miombo KT2 Ø < 20cm (23)	259.63	1.01		6	3.0
Kululu Miombo KT3 Ø ≥ 20cm (28)	75.20	5.72	7.61	15.8 / 13	37.2
Kululu Miombo KT3 Ø < 20cm (28)	171.55	1.29		6	3.9
Rungwa Miombo RT1 Ø ≥ 20cm (15)	37.62	2.22	4.60	12.1 / 9	10.0
Rungwa Miombo RT1 Ø < 20cm (15)	305.62	1.56		5	3.9
Rungwa savanna RT1 Ø < 20cm (20)	275.03	1.45	2.20	5	3.6
Rungwa Miombo RT2 Ø ≥ 20cm (21)	48.76	4.38	7.24	13.7 / 11	24.1
Rungwa Miombo RT2 Ø < 20cm (21)	478.93	2.25		5	5.6
Rungwa savanna RT2 Ø < 20cm (8)	274.12	1.43	1.25	5	3.6
Rungwa Miombo RT3 Ø ≥ 20cm (20)	37.19	4.21	6.40	13.9 / 11	23.2
Rungwa Miombo RT3 Ø < 20cm (20)	409.73	1.83		5	4.6

The **absolute frequency** of the first five tree/shrub species for both diameter classes is presented for miombo woodlands in Kululu Community Forest Reserve (KT1-3) in Table 3:

**Table 3: Absolute species frequency in miombo woodlands of Kululu Community Forest Reserve**

Trees Ø ≥ 20cm		Trees/shrubs Ø < 20cm	
Species	Absolute frequency (KT1-3) %	Species	Absolute frequency (KT1-3) %
<i>Julbernardia globiflora</i>	45, 57, 43	<i>Diplorhynchus condylocarpon</i>	41, 30, 36
<i>Brachystegia spiciformis</i>	41, 52, 43	<i>Julbernardia globiflora</i>	24, 30, 25
<i>Brachystegia glaucescens/boehmii</i>	17, 30, 32	<i>Pseudolachnostylis maproun.</i>	21, 17, 25
<i>Pericopsis angolensis</i>	14, 22, 18	<i>Terminalia sericea</i>	17, 30, 14
<i>Burkea africana</i> / <i>Pseudolachnostylis maproun.</i>	28, 9, 14 / 21, 9, 21	<i>Brachystegia spiciformis</i>	7, 30, 14

The **absolute frequency** of the first five tree/shrub species for both diameter classes is presented for miombo woodlands (RT1-3) and open vegetation (RT1-2) in Rungwa River FR in Tables 4 and 5, respectively. Only species occurring in at least two transects were considered.

**Table 4: Absolute species frequency in miombo woodlands of Rungwa River FR**

Trees Ø ≥ 20cm		Trees/shrubs Ø < 20cm	
Species	Absolute frequency (RT1-3) %	Species	Absolute frequency (RT1-3) %
<i>Julbernardia globiflora</i>	40, 43, 45	<i>Julbernardia globiflora</i>	20, 48, 25
<i>Pseudolachnostylis maproun.</i>	7, 43, 45	<i>Diplorhynchus condylocarpon</i>	20, 24, 40
<i>Terminalia sericea</i>	27, 10, 5	<i>Pseudolachnostylis maproun.</i>	-, 33, 20
<i>Burkea africana</i>	13, 5, 20	<i>Brachystegia stipulata,</i> <i>Combretum zeyheri</i>	20, 5, 20 / 40, 5, - /
<i>Brachystegia spiciformis</i>	13, 14, -		

**Table 5: Absolute species frequency in open vegetation of Rungwa River FR**

Trees Ø ≥ 20cm		Trees/shrubs Ø < 20cm	
Species	Absolute frequency (RT1-2) %	Species	Absolute frequency (RT1-2) %
Few isolated trees occur:		<i>Combretum fragrans</i>	65, 100
<i>Terminalia mollis</i> (3)		<i>Bauhinia petersiana</i>	40, 38
<i>Brachystegia florib./long.</i> (2)		<i>Terminalia mollis</i>	35, 25
<i>Combretum molle</i> (1)		<i>Acacia drepanolobium</i>	20, 13
<i>Combretum zeyheri</i> (1)			
<i>Lannea schimperi</i> (1)			
<i>Pericopsis angolensis</i> (1)			
<i>Terminalia sericea</i> (1)			

The **dominance** values (product of mean basal area and species number per ha) for the first five tree/shrub species for both diameter classes is presented for Kululu Community Forest Reserve and Rungwa River FR in tables 6 - 8 below. Only species occurring in at least two transects were considered. Species not present in one transect got assigned a value one higher than the total number of species.

**Table 6: Species dominance in miombo woodlands of Kululu Community Forest Reserve**

Trees Ø ≥ 20cm		Trees/shrubs Ø < 20cm	
Species	Mean Ranking RT1-3	Species	Mean Ranking RT1-3
<i>Brachystegia spiciformis</i>	1.3	<i>Diplorhynchus condylocarpon</i>	2.3
<i>Julbernardia globiflora</i>	2.0	<i>Pseudolachnostylis maproun.</i>	4.3
<i>Brachystegia glaucesc./boehmii</i>	3.3	<i>Brachystegia spiciformis /</i> <i>Julbernardia globiflora</i>	7.0
<i>Pericopsis angolensis</i>	4.7	<i>Pericopsis angolensis</i>	9.0
<i>Brachystegia florib./long.</i>	5.7		

**Table 7: Species dominance in miombo woodlands of Rungwa River FR**

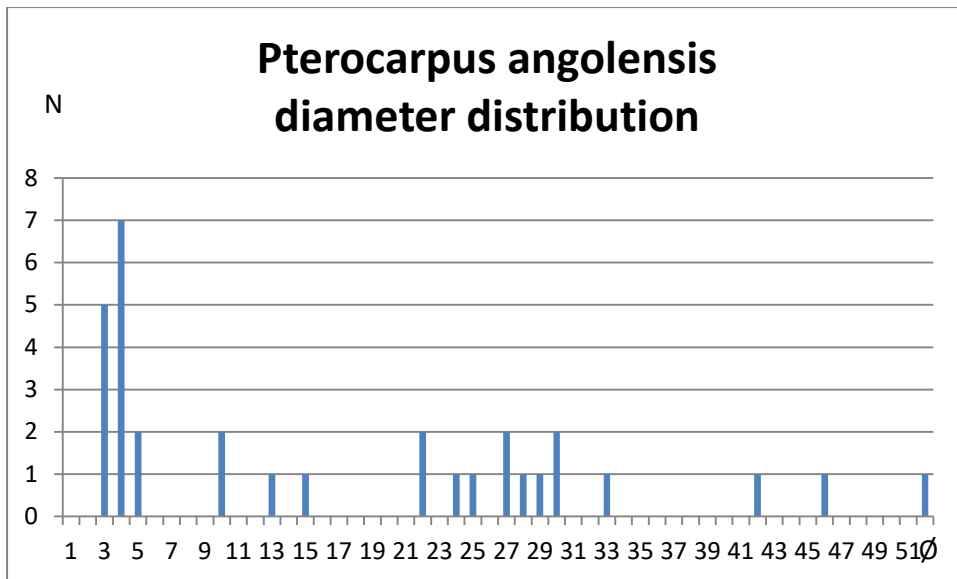
Trees Ø ≥ 20cm		Trees/shrubs Ø < 20cm	
Species	Mean Ranking RT1-3	Species	Mean Ranking RT1-3
<i>Julbernardia globiflora</i>	1.0	<i>Diplorhynchus condylocarpon</i>	6.0
<i>Pseudolachnostylis maproun.</i>	6.7	<i>Julbernardia globiflora</i>	6.3
<i>Brachystegia glaucesc./boehmii / Terminalia mollis</i>	7.3	<i>Combretum fragrans</i>	6.7
<i>Brachystegia spiciformis / Brachystegia stipulata / Burkea africana /</i>	9.7	<i>Brachystegia stipulata</i>	8.3
		<i>Brachystegia glaucesc./boehmii</i>	9.3

**Table 8: Species dominance in open vegetation of Rungwa River FR**

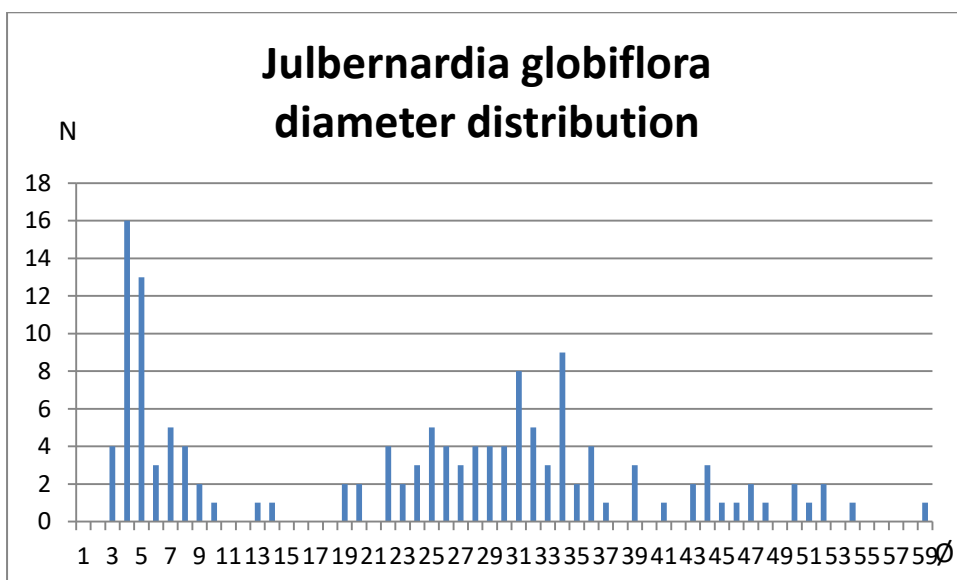
Trees Ø ≥ 20cm		Trees/shrubs Ø < 20cm	
Species	Mean Ranking (RT1-2)	Species	Mean Ranking (RT1-2)
Few isolated trees occur: <i>Terminalia mollis</i> (3) <i>Brachystegia florib./long.</i> (2) <i>Combretum molle</i> (1) <i>Combretum zeyheri</i> (1) <i>Lannea schimperi</i> (1) <i>Pericopsis angolensis</i> (1) <i>Terminalia sericea</i> (1)		<i>Combretum fragrans</i>	1.0
		<i>Terminalia mollis</i>	2.0
		<i>Bauhinia petersiana</i>	4.5
		<i>Acacia drepanolobium</i>	7

The diameter distribution of *Pterocarpus angolensis* and *Julbernardia globiflora* is shown in Figures 6 and 7.





**Fig. 6.** Diameter distribution of *Pterocarpus angolensis* (all six transects).



**Fig. 7.** Diameter distribution of *Julbernardia globiflora* (all six transects).

The  $\alpha$ -diversity for trees and shrubs of miombo woodlands for Kululu Community Forest Reserve and Rungwa River FR is shown in Table 9 below:

**Table 9: The alpha- diversity of trees and shrubs of miombo woodlands**

Protected area	$\varnothing \geq 20\text{cm}$	$\varnothing < 20\text{cm}$
Kululu Community Forest Reserve (KT1 – 3)	27	47
Rungwa River FR (RT1 – 3)	29	40
Total $\alpha$ -diversity	37	59

The checklist for Mlele and Sikonge districts now includes a total of 151 trees/shrubs with their scientific and vernacular names (see Appendix C).

## 4.2 Human ecosystem disturbances

All human disturbances recorded on a width of 80 m along the transects in Kululu Community Forest Reserve and Rungwa River FR are summarised in tables 10 and 11 below.

**Table 10: Human disturbances along Kululu Community Forest Reserve transects**

Type of disturbances	Magnitude (quantity)	Position along the transect
<b>Mwitikio section: KT1</b>		
Timber logging	about 50 trees cut, primarily <i>Brachystegia spiciformis</i> , <i>Pseudolachnostylis maprouneifolia</i> , <i>Terminalia sericea</i> (2020) 1 <i>Brachystegia spiciformis</i> cut	Point 1, 0-100 steps  Point 14
Building constructions	fishermen camp: fireplace timber sawing camp (2 years) Camp of wild honey harvester	Point 1 Point 6 +270 steps Point 20 +140 steps
Tree barking	1 <i>Brachystegia spiciformis</i> (2020) 1 <i>Julbernardia globiflora</i> (2020) 2 <i>Julbernardia globiflora</i> (2 years) 1 <i>Julbernardia globiflora</i> (3 years) 1 <i>Julbernardia globiflora</i> (5 years) 3 <i>Julbernardia globiflora</i> (3 years) 1 <i>Julbernardia globiflora</i> (2 years) 1 <i>Brachystegia spiciformis</i> (1 year) 1 <i>Brachystegia spiciformis</i> (1 <sup>st</sup> quarter tree) (4 years)	Point 1 Point 1 +200 steps Point 3 +270 steps Point 4 +5 steps Point 4 +25 steps Point 4 +100 steps Point 5 + 30 steps Point 11 +30 steps Point 13
Poaching	remains of a poached giraffe (4 days)	Point 2 +250 steps
<b>Kapumpa section north: KT2</b>		
Timber logging	1 <i>Pericopsis angolensis</i> cut 1 <i>Azelia quanzensis</i> cut (3 years) 1 <i>Pterocarpus angolensis</i> cut 1 <i>Brachystegia spiciformis</i> cut (6 years)	Point 1 +250 steps  Point 5 +5 steps
Tree barking	1 <i>Julbernardia globiflora</i> (7 years)	Point 2
<b>Kapumpa section south: KT3</b>		
Cattle grazing	1 animal herd of about 100 cattles Grazing grounds	Point 1 Point 2

**Table 11: Human disturbances along Rungwa River FR transect**

Type of disturbances	Magnitude (quantity)	Position along the transect
<b>Rungwa River: RT1</b>		
Timber logging	Tree harvesting with permit stopped in 2018 1 <i>Pterocarpus angolensis</i> cut (6 years) 1 <i>Pterocarpus angolensis</i> cut (4 years)	Point 15 +280 steps Point 22 +250-270 steps Point 33 +120 steps
Building constructions	Camp of wild honey harvester (2020)	Point 12 +150 steps
Tree cutting for harvesting wild honey	1 <i>Brachystegia spiciformis</i> cut (2020) 1 <i>Pterocarpus angolensis</i> cut (2020) 1 <i>Julbernardia globiflora</i> cut (2 years) 1 <i>Julbernardia globiflora</i> cut (the day before) 1 <i>Manilkara mochisia</i> cut (1 year) 1 <i>Julbernardia globiflora</i> cut (1 year)	Point 11 +120 steps Point 11 +200 steps Point 22 +250-270 steps Point 32 +220 steps Point 33 +80 steps
Tree barking	1 <i>Julbernardia globiflora</i> (2020)	Point 24 +280 steps
<b>West: RT2</b>		
Disturbances	None	None
<b>East: RT3</b>		
Timber logging	1 <i>Pterocarpus angolensis</i> cut	Point 3 +90 steps
Building constructions	Camp of wild honey harvester	Point 6 + 130 steps
Tree barking	Tree barking	Point 7

## 5) Discussions

### Current state of the vegetation

This survey focussed on miombo woodlands since this vegetation is largely dominating in the investigated protected areas. The savanna vegetation of mbugas including the open vegetation near the Rungwa River was analysed only in Rungwa River FR with 28 sampling points along the two transects RT1 and RT2. The vegetation of riverine forests, mainly occurring along Kululu and Rungwa rivers, were not assessed.

In total 164 sampling points were analysed including 420 trees of the larger diameter class ( $\geq 20$  cm) and 655 trees/shrubs of the lower diameter class ( $< 20$  cm) considering quarters with no trees (see Table 12).

**Table 12: Quarters with no trees**

Transect	N quarters with no trees diameter class ( $\geq 20$ cm)	N quarters with no trees diameter class ( $< 20$ cm)
KT1	16	
KT2	25	
KT3	14	
RT1	18	
RT2	20	
RT3	31	1
Total	<b>124</b>	<b>1</b>

*Julbernardia globiflora* a characteristic, widespread and often dominating species of many miombo woodlands is the most frequent species in Kululu Community Forest Reserve and Rungwa River FR. It grows all over both protected areas and often gregariously and is abundant in both, upper and lower layer (see Tables 3 – 8). Its bark is often used for making traditional beehives what leads to the death of the tree (see Tables 10 and 11).

*Brachystegia spiciformis*, another typical miombo species, is the second most common tree of the upper layer, especially in Kululu Community Forest Reserve. This species can reach large trunks (see Fig. 8) and is increasingly searched for timber since sawable dimensions of traditional timber species like *Pterocarpus angolensis* are becoming very rare.

Other common *Brachystegia* species are *Brachystegia* cf. *glaucecens* or *boehmii* a medium to large tree and *B.* cf. *floribunda* or *longifolia* often occurring near mbugas. We did not manage to exactly identifying these trees at species level since *Brachystegia* species are thought to hybridise easily with other species from the same genus (Smith & Allen 2004).

Typically, tree diameter distributions of natural forest form a reverse J-shaped or negative exponential curve. This is not the case for *Pterocarpus angolensis* and *Julbernardia globiflora* showing an under-representation of saplings as illustrated in Figures 5 and 6. The low abundance of saplings is probably typical for miombo trees where natural regeneration is poor and sparsely because of poor seedling survival during establishment mainly due to recurrent fires and browsing what has been shown for *Pterocarpus angolensis* by Mojeremane & Lumbile (2016). *Pterocarpus angolensis* produces one of the best timbers in East Africa and due to overexploitation mature stems become very rare and is considered as near threatened according to the IUCN Red List. It would be interested to analyse the diameter class distribution for other timber species which are now increasingly used but our data are too sparse.

The understoreys are widely dominated by *Diplorhynchus condylocarpon* which is easily recognised by the abundant milky latex in its branches. Another very common and small tree is *Pseudolachnostylis maprouneifolia*.

On open areas near Rungwa River and in annually flooded mbugas few scattered trees occur including *Combretum fragrans*, *Bauhinia petersiana*, *Terminaria mollis* and *Acacia drepanolobium*. However, since the transects focussed on miombo woodlands, the data are quite sparse and might be not be very representative for open areas.

The alpha-diversity assessed by the transect survey is quite similar in Kululu Community Forest Reserve and Rungwa River FR with 27 and 29 tree species of the larger diameter class, respectively, and 47 and 40 tree/shrub species of the lower diameter class,

respectively. The total alpha-diversity for both protected areas together is 37 trees in the larger diameter class and 59 trees/shrubs in the lower diameter class.



**Fig. 8.** Large *Brachystegia spiciformis* tree on the upper land in Mlele Beekeeping Zone (vegetation survey from 2018).

Based on all vegetation surveys conducted in the protected areas of Mlele and Sikonge districts, 151 trees/shrubs have been recorded with their scientific and vernacular names (see Appendix C). This quite exhaustive plant list will be very useful for any future forest management in the area and for the assessment of the importance of the non-timber forest products for the livelihoods of the adjacent local communities. The following species could not yet identify with their scientific names with certainty and need further investigations (see Table 13 below):



**Table 13: Tree/shrubs to be identified with their scientific names**

<b>Vernacular name</b>	<b>Scientific name to be identified/confirmed</b>
Kapondolampassa	<i>Dalbergia boehmii</i>
Mdaa (Msubata)	<i>Euclea schimperi</i>
Kama mponda	<i>Commiphora mollis</i>
Mumwaga	<i>Ochna longipes</i>
Mshenene	<i>Xylopia antunesii</i>
Kama mgunga	<i>Entada abyssinica</i>
Mpilipili	<i>Albizia vesicular</i> / <i>A. antunesiana</i>
Kama mkoma	<i>Grewia</i> sp.
Mlungwanyama	?
Mtandara	?

The basal areas determined with PCQM and Bitterlich methods are highly concordant (see Table 2). Tree density in the larger diameter class, total basal area and estimated tree height are significantly higher in Kululu Community Forest Reserve than in Rungwa River FR. Consequently the total standing volume for Kululu Community Forest Reserve varies between 37 and 50 m<sup>3</sup> compared to 14 to 30 m<sup>3</sup> in Rungwa River FR. The PCQM is a very suitable method for more or less closed woodland stands but has its limits in more open areas with many quarters with no trees what requires the use of a correction factor.

The extrapolation of the mean forest parameters per hectare to the entire area of each protected areas is not possible since vegetation maps are missing. Detailed vegetation maps showing the different vegetation types and land use in the project areas would be a very useful tool for the management and the monitoring of the area. Such maps would also allow to spatially stratify the project area with well-defined units which could supports other studies in future.

About six to ten sampling points along a transect can be surveyed if access is not a major constraint. The necessary equipment for the transect survey consist of 20m-tape measure, diameter tape measure, compass, camera, GPS and the Bitterlich instrument (metal sheet fixed on a wooden stick of 50 cm length).

### **Human ecosystem disturbances**

Tree barking for producing bee hives, timber logging and tree cutting for harvesting wild honey were the prevelant disturbances. Since the second survey has been realised during the rainy season in January / February 2021 we assume that many human disturbances could not be detected due to dense vegetation and in particular due to high grasses. Therefore, the human disturbances surveyed during the wet season have to be reassessed during the dry season for having reliable data for the entire transects and for the planed publication of the results. We expect a workload of one day per transect (five transects, only one, RT1, was fully surveyed in the dry season).

## **6) Conclusions**

The applied transect methodology allows to assess vegetation and disturbances data at once. The plotless PCQM method has the advantage in that it does not require laying out plot boundaries what saves considerable time. It is quite simple to apply but needs an experienced team leader for the location of the transect or its relocation due to an open area

or a major disturbance for getting representative data. An additional three to four persons are required, each of them has a specific task. At least one person should have profound knowledge of tree and shrub species (scientific and/or vernacular names). All team members were trained on-the-spot and have now a good understanding of the different steps of the methodology.

For future vegetation transect surveys it is suggested to associate VGSs which are not yet trained and members from the Village Natural Resource Committee to explain them the importance of baseline data and regular monitoring of the state of the forest for management purposes.

Vegetation maps are highly needed for the extrapolation of the mean forest parameters per hectare to the entire area of the protected areas and would facilitate the management of the area. Since we assume that many human disturbances have been overlooked during the second survey in the wet season, the concerned sections of the transects have to be reassessed during the dry season for having reliable data for the planned scientific article on the current state of the vegetation of the miombo woodlands within Rungwa and Katavi – Ugalla corridors.

## 7) Recommendations

The following recommendations are made to ADAP:

- 1) Instruct the VGS's to collect fresh plant samples (including photographs) for pressing and drying the specimen from the following not yet scientifically identified species: Kapondolampassa, Mdaa (Msubata), Kama mponda, Mumwaga, Mshenene, Kama mgunga, Mpilipili, Kama mkoma, Mlungwanyama, and Mtandara.
- 2) Additional investigations must be made for exactly identifying *Brachystegia* cf. *glaucecens* or *boehmii* and *B. cf. floribunda* or *longifolia*. The current vegetation survey in Mulele Hills FR may help us to further clarify these *Brachystegia* species.
- 3) Rectify the coordinates of some sampling points and elaborate new transect location maps for Kululu Community Forest Reserve and Rungwa River FR.
- 4) Train all VGS in the transect methodology under the supervision of the livelihood and natural resources officer. The transect survey should be repeated every four years (also for Mulele Hills FR) by the VGS under the supervision of the livelihood and natural resources officer for monitoring the state and trends of the forests and its human disturbances. An active participation of TFS, DFO and Village Natural Resource Committee is highly recommended.
- 5) Improve the map of Kululu Community Forest Reserve by recording additional coordinates of the boundaries, tracks, camps and other points of interest; amend the marking of the boundaries (sign boards, tree marking) including internal boundaries within the forest owned by each village.
- 6) Reassess in the dry season the human disturbances recorded during the wet season (only concerned sections of the transects) for having reliable data for the entire transects.
- 7) Elaborate a first publication on the current state of the vegetation of the miombo woodlands within Rungwa and Katavi – Ugalla corridors. The transect methodology

based on the PCQM and its high potential for rapidly monitoring and evaluating the state of the vegetation and the human ecosystem disturbances will be discussed.

- 8) Design a concept for elaborating a vegetation map for Mlele and Sikonge districts including TFS and DFOs. The transect data and the photographs from the sampling points from this survey, that in Mlele BKZ (Bloesch 2019) and from the ongoing survey in Mulele Hills FR could be used as ground truth for elaborating the map. This study could be conducted jointly by Swiss and Tanzanian BSc/MSc students.

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## Appendix A: Vegetation transects in Kululu Community Forest Reserve

### Transect KT1: Mwitikio section

Starting point about 100 steps south of Kululu river (near camp Mzee Johni: S 6°39'30.6" / E 33°29'19.4"); direction azimuth: 180°

#### Sampling point 1:

Coordinates: S 6°39'24.6" / E 33°29'13.0"

Slope: 15%, slope exposure: 360°

Dominant tree height: 16 m (20 m *Burkea africana*)

Basal area (Bitterlich, k=1): 9 m<sup>2</sup>

Photos: 7242, 7243, 7244, 7245

Disturbances/notes (1-2): fishermen camp: fireplace, tree barking of 1 *Brachystegia spiciformis* (2020) (sampling point); about 50 trees cut, primarily *Brachystegia spiciformis*, *Pseudolachnostylis maprouneifolia*, *Terminalia sericea* (2020) (0-100 steps); tree barking 1 *Julbernardia globiflora* (2020) (200 steps)

Diameter class	Nearest species in the each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Burkea africana</i>	43	13.20
	<i>Pseudolachnostylis maprouneifolia</i>	26	3.40
	No tree		
DBH < 20 cm	<i>Crossopterix febrifuga</i>	33	6.70
	<i>Pseudolachnostylis maprouneifolia</i>	15	7.70
	<i>Pseudolachnostylis maprouneifolia</i>	13	3.00
	<i>Hexalobus monopetalus</i>	5	1.80
	<i>Bauhinia petersiana</i>	5	11.20

#### Sampling point 2:

Coordinates: S 6°39'32.5" / E 33°29'12.3"

Slope: 3-5%, slope exposure: 315°

Dominant tree height: 14 m

Basal area (Bitterlich, k=1): 6.5 m<sup>2</sup>

Photos: 7246, 7247, 7248, 7249

Disturbances/notes (2-3): remains of a poached giraffe (4 days) (250 steps)

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Pseudolachnostylis maprouneifolia</i>	24	1.00
	<i>Pterocarpus angolensis</i>	29	7.10
	<i>Burkea africana</i>	32	6.30
	<i>Pterocarpus angolensis</i>	22	10.40
DBH < 20 cm	<i>Cassipourea mollis</i>	9	1.40
	<i>Rothmannia engleriana</i>	6	9.30
	<i>Vangueriopsis lanciflora</i>	10	3.60
	<i>Hymenocardia acida</i>	6	4.90

#### Sampling point 3:

Coordinates: S 6°39'40.7" / E 33°29'12.5"

Slope: 0-2%, slope exposure: 360°

Dominant tree height: 15 m

Basal area (Bitterlich, k=1): 6.5 m<sup>2</sup>

Photos: 7253, 7254, 7255, 7256

Disturbances/notes (3-4): tree barking 2 *Julbernardia globiflora* (2 years) (270 steps)

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	No tree		



	<i>Burkea africana</i>	23	12.90
	<i>Combretum collinum</i>	26	8.00
	<i>Strychnos potatorum</i>	26	10.20
DBH < 20 cm	<i>Diplorhynchus condylocarpon</i>	5	3.30
	<i>Pseudolachnostylis maprouneifolia</i>	4	4.20
	<i>Phyllocosmus leimareanus</i>	4	0.80
	<i>Pseudolachnostylis maprouneifolia</i>	6	5.90

#### Sampling point 4:

Coordinates: S 6°39'48.5" / E 33°29'10.8"

Slope: +/- flat

Dominant tree height: 16 m

Basal area (Bitterlich, k=1): 10 m<sup>2</sup>

Photos: 7257, 7258, 7259, 7260

Disturbances/notes (4-5): tree barking: 1 *Julbernardia globiflora* (3 years) (5 steps), 1 *Julbernardia globiflora* (5 years) (25 steps), 3 *Julbernardia globiflora* (3 years) (100 steps);

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Julbernardia globiflora</i>	27	5.90
	<i>Julbernardia globiflora</i>	25	3.90
	<i>Julbernardia globiflora</i>	30	6.20
	<i>Julbernardia globiflora</i>	30	4.90
DBH < 20 cm	<i>Diplorhynchus condylocarpon</i>	7	3.80
	<i>Pericopsis angolensis</i>	10	2.40
	<i>Diplorhynchus condylocarpon</i>	8	3.50
	<i>Diplorhynchus condylocarpon</i>	7	9.80

#### Sampling point 5:

Coordinates: S 6°39'56.1" / E 33°29'10.8"

Slope: +/- flat

Dominant tree height: 15 m

Basal area (Bitterlich, k=1): 5.5 m<sup>2</sup>

Photos: 7261, 7262, 7263, 7264

Disturbances/notes (5-6): tree barking 1 *Julbernardia globiflora* (2 years) (130 steps)

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Julbernardia globiflora</i>	31	4.60
	No tree		
	<i>Albizia antunesiana</i>	31	8.70
	<i>Brachystegia glaucescens</i>	32	14.10
DBH < 20 cm	<i>Cassipourea mollis</i>	12	6.10
	<i>Julbernardia globiflora</i>	4	5.90
	<i>Julbernardia globiflora</i>	6	4.70
	<i>Brachystegia glaucescens</i>	4	5.80

#### Sampling point 6:

Coordinates: S 6°40'04.1" / E 33°29'09.4"

Slope: +/- flat

Dominant tree height: 18 (20) m

Basal area (Bitterlich, k=1): 6 m<sup>2</sup>

Photos: 7269, 7270, 7271, 7272

Disturbances/notes (6-7): timber sawing camp (2 years) (270 steps)

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Brachystegia glaucescens</i>	50	8.10
	<i>Pseudolachnostylis maprouneifolia</i>	22	18.80

	<i>Diplorhynchus condylocarpon</i>	20	10.10
	<i>Brachystegia glaucescens</i>	23	11.60
DBH < 20 cm	<i>Terminalia mollis</i>	9	11.15
	<i>Julbernardia globiflora</i>	4	12.10
	<i>Pterocarpus angolensis</i>	3	5.40
	<i>Schrebera trichoclada</i>	8	5.50

**Sampling point 7:**

Coordinates: S 6°40'11.7" / E 33°29'08.6"

Slope: +/- flat

Dominant tree height: 16 m

Basal area (Bitterlich, k=1): 8.5 m<sup>2</sup>

Photos: 7273, 7274, 7275, 7276

Disturbances/notes: -

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Brachystegia floribunda</i>	40	10.70
	<i>Pseudolachnostylis maprouneifolia</i>	32	10.30
	<i>Lannea schimperi</i>	28	15.00
	<i>Brachystegia stipulata</i>	49	10.80
DBH < 20 cm	<i>Vangueriopsis lanciflora</i>	8	5.90
	<i>Vangueriopsis lanciflora</i>	8	12.40
	<i>Bauhinia petersiana</i>	9	2.55
	<i>Ozoroa insignis</i> subsp. <i>reticulata</i>	11	3.55

**Sampling point 8:**

Coordinates: S 6°40'19.8" / E 33°29'08.1"

Slope: +/- flat

Dominant tree height: 10 (12) m

Basal area (Bitterlich, k=1): 5 m<sup>2</sup>

Photos: 7277, 7278, 7279, 7280

Disturbances/notes: -

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	No tree		
	No tree		
	<i>Brachystegia floribunda</i>	25	17.90
	<i>Brachystegia floribunda</i>	26	14.40
DBH < 20 cm	<i>Julbernardia globiflora</i>	10	4.00
	<i>Crossopterix febrifuga</i>	3	4.40
	<i>Phyllocosmus leimareanus</i>	7	5.00
	<i>Oldfieldia dactyloohylla</i>	18	8.00

**Sampling point 9:**

Coordinates: S 6°40'27.6" / E 33°29'07.8"

Slope: +/- flat

Dominant tree height: 14 (16) m

Basal area (Bitterlich, k=1): 8.5 m<sup>2</sup>

Photos: 7281, 7282, 7283, 7284

Disturbances/notes: -

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Julbernardia globiflora</i>	34	9.70
	<i>Brachystegia floribunda</i>	29	9.20
	<i>Pterocarpus angolensis</i>	30	4.10
	<i>Brachystegia floribunda</i>	32	6.90

DBH < 20 cm	<i>Diplorhynchus condylocarpon</i>	5	10.30
	<i>Hexalobus monopetalus</i>	8	4.70
	<i>Oldfieldia dactyloophylla</i>	18	1.60
	<i>Crossopterix febrifuga</i>	13	11.10

**Sampling point 10:**

Coordinates: S 6°40'35.8" / E 33°29'07.7"

Slope: +/- flat

Dominant tree height: 15 m

Basal area (Bitterlich, k=1): 9.5 m<sup>2</sup>

Photos: 7285, 7286, 7287, 7288

Disturbances/notes: -

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Pericopsis angolensis</i>	46	11.30
	<i>Brachystegia spiciformis</i>	48	13.00
	<i>Brachystegia spiciformis</i>	45	9.80
	No tree		
DBH < 20 cm	<i>Julbernardia globiflora</i>	4	1.40
	<i>Brachystegia spiciformis</i>	7	1.65
	<i>Julbernardia globiflora</i>	3	1.40
	<i>Diplorhynchus condylocarpon</i>	13	1.80

**Sampling point 11:**

Coordinates: S 6°40'43.6" / E 33°29'08.2"

Slope: +/- flat

Dominant tree height: 15 m

Basal area (Bitterlich, k=1): 13 m<sup>2</sup>

Photos: 7289, 7290, 7291, 7292

Disturbances/notes (11-12): tree barking 1 *Brachystegia spiciformis* (1 year) (30 steps)

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Combretum molle</i>	21	4.50
	<i>Burkea africana</i>	20	9.40
	<i>Brachystegia floribunda</i>	27	9.80
	<i>Pseudolachnostylis maprouneifolia</i>	22	15.50
DBH < 20 cm	<i>Burkea africana</i>	11	1.40
	<i>Terminalia sericea</i>	15	2.50
	<i>Monotes africana</i>	10	6.20
	<i>Terminalia sericea</i>	16	2.10

**Sampling point 12:**

Coordinates: S 6°40'51.8" / E 33°29'08.5"

Slope: +/- flat

Dominant tree height: 16 m

Basal area (Bitterlich, k=1): 16 m<sup>2</sup>

Photos: 7293, 7294, 7295, 7296

Disturbances/notes: -

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Monotes africana</i>	23	5.60
	No tree		
	<i>Brachystegia floribunda</i>	85	18.65
	<i>Pseudolachnostylis maprouneifolia</i>	22	16.65
DBH < 20 cm	<i>Julbernardia globiflora</i>	5	0.80
	<i>Terminalia sericea</i>	4	4.80

	<i>Lannea schimperi</i>	3	1.20
	<i>Brachystegia floribunda</i>	7	2.60

**Sampling point 13:**

Coordinates: S 6°41'00.0" / E 33°29'08.4"

Slope: +/- flat

Dominant tree height: 16 m

Basal area (Bitterlich, k=1): 13.5 m<sup>2</sup>

Photos: 6052, 6053, 6054, 6055

Disturbances/notes: 1 *Brachystegia spiciformis* (1<sup>st</sup> quarter tree) tree barking (4 years) (0 steps)

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Brachystegia spiciformis</i>	23	6.15
	<i>Julbernardia globiflora</i>	32	11.70
	<i>Brachystegia spiciformis</i>	55	14.80
	<i>Lonchocarpus capassa</i>	23	5.50
DBH < 20 cm	<i>Brachystegia spiciformis</i>	19	10.00
	<i>Diplorhynchus condylocarpon</i>	5	2.60
	<i>Diplorhynchus condylocarpon</i>	14	5.50
	<i>Dichrostachys cinerea</i>	5	6.80

**Sampling point 14:**

Coordinates: S 641080 / E 3329055

Slope: 2%

Dominant tree height: 18 m

Basal area (Bitterlich, k=1): 11 m<sup>2</sup>

Photos: -

Disturbances/notes: 1 *Brachystegia spiciformis* cut (0 steps)

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Brachystegia longifolia</i>	27	12.4
	<i>Brachystegia longifolia</i>	40	7.8
	<i>Julbernardia globiflora</i>	22	9.2
	<i>Brachystegia spiciformis</i>	29	10.4
DBH < 20 cm	<i>Ochna longipes</i>	11	5.7
	<i>Erythrophleum africanum</i>	12	2.3
	<i>Erythrophleum africanum</i>	5	8.6
	<i>Commiphora mosambicensis</i>	5	2.8

**Sampling point 15:**

Coordinates: S 641155 / E 3329021

Slope: 1%

Dominant tree height: 16 m

Basal area (Bitterlich, k=1): 9 m<sup>2</sup>

Photos: -

Disturbances/notes: -

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Brachystegia spiciformis</i>	26	13.2
	<i>Brachystegia longifolia</i>	26	5.0
	No tree		
	<i>Xylopiantunesii</i>	20	11.7
DBH < 20 cm	<i>Burkea africana</i>	11	3.3
	<i>Erythrophleum africanum</i>	6	1.0
	<i>Terminalia sericea</i>	4	2.8

	<i>Erythrophleum africanum</i>	3	2.1
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**Sampling point 16:**

Coordinates: S 641267 / E 3328576

Slope: 2%

Dominant tree height: 17 m

Basal area (Bitterlich, k=1): 10 m<sup>2</sup>

Photos: -

Disturbances/notes: -

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Pterocarpus angolensis</i>	24	5.0
	<i>Lannea schimperi</i>	24	2.3
	<i>Julbernardia globiflora</i>	29	5.1
	<i>Brachystegia spiciformis</i>	34	1.2
DBH < 20 cm	<i>Parinari curatellifolia</i>	10	6.9
	<i>Strychnos spinosa</i>	4	2.3
	<i>Combretum collinum</i>	7	2.2
	<i>Julbernardia globiflora</i>	5	2.8

**Sampling point 17:**

Coordinates: S 641356 / E 332859

Slope: 1%

Dominant tree height: 15 m

Basal area (Bitterlich, k=1): 7 m<sup>2</sup>

Photos: -

Disturbances/notes: -

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	No tree		
	<i>Combretum zeyheri</i>	22	10.4
	No tree		
	No tree		
DBH < 20 cm	<i>Pseudolachnostylis maprouneifolia</i>	6	11.3
	<i>Brachystegia stipulata</i>	5	0.8
	<i>Combretum fragrans</i>	5	6.2
	<i>Terminalia sericea</i>	4	8.0

**Sampling point 18:**

Coordinates: S 641455 / E 332856

Slope: 1%

Dominant tree height: 17 m

Basal area (Bitterlich, k=1): 11 m<sup>2</sup>

Photos: -

Disturbances/notes: -

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Burkea africana</i>	22	7.6
	<i>Julbernardia globiflora</i>	22	1.7
	No tree		
	<i>Crossopteryx febrifuga</i>	41	6.9
DBH < 20 cm	<i>Diplorhynchus condylocarpon</i>	5	6.0
	<i>Cassipourea mollis</i>	11	3.9
	<i>Combretum collinum</i>	7	2.8
	<i>Diplorhynchus condylocarpon</i>	10	6.2

**Sampling point 19:**

Coordinates: S 641542 / E 3328473  
 Slope: 2%  
 Dominant tree height: 13 m  
 Basal area (Bitterlich, k=1): 9 m<sup>2</sup>  
 Photos: -  
 Disturbances/notes: -

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Pericopsis angolensis</i>	49	10.1
	<i>Terminalia sericea</i>	21	9.1
	<i>Pterocarpus angolensis</i>	27	7.5
	<i>Burkea africana</i>	21	10.7
DBH < 20 cm	<i>Bauhinia petersiana</i>	8	6.0
	<i>Schrebera trichoclada</i>	7	1.3
	<i>Diplorhynchus condylocarpon</i>	6	5.5
	<i>Terminalia sericea</i>	12	1.5

**Sampling point 20:**

Coordinates: S 642040 / E 3328447; near river mkombizi, mbuga not considered in Miombo analysis  
 Slope: 1%  
 Dominant tree height: 14 m  
 Basal area (Bitterlich, k=1): 5 m<sup>2</sup>  
 Photos: -  
 Disturbances/notes: beekeeping camp (141 steps)

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	No tree		
	No tree		
	No tree		
	No tree		
DBH < 20 cm	<i>Bauhinia petersiana</i>	7	3.7
	<i>Pterocarpus angolensis</i>	3	2.9
	<i>Bauhinia petersiana</i>	13	3.4
	<i>Combretum zeyheri</i>	19	8.4

**Sampling point 21:**

Coordinates: S 642135 / E 3328433;  
 Slope: 1-2%  
 Dominant tree height: 14 m  
 Basal area (Bitterlich, k=1): 9 m<sup>2</sup>  
 Photos: -  
 Disturbances/notes: -

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	No tree		
	<i>Julbernardia globiflora</i>	36	13.6
	No tree		
DBH < 20 cm	<i>Crossopteryx febrifuga</i>	23	15.0
	<i>Combretum molle</i>	10	4.1
	<i>Ochna longipes</i>	11	3.7
	<i>Bauhinia petersiana</i>	6	2.1
	<i>Burkea africana</i>	14	3.5

**Sampling point 22:**

Coordinates: S 64228 / E 3328408;  
 Slope: 3%



Dominant tree height: 18 m  
 Basal area (Bitterlich, k=1): 10 m<sup>2</sup>  
 Photos: -  
 Disturbances/notes: -

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Brachystegia spiciformis</i>	36	20.0
	<i>Brachystegia spiciformis</i>	55	14.7
	<i>Pericopsis angolensis</i>	26	3.8
	<i>Terminalia sericea</i>	26	8.7
DBH < 20 cm	<i>Diplorhynchus condylocarpon</i>	14	9.4
	<i>Burkea africana</i>	15	3.4
	<i>Strychnos spinosa</i>	3	2.0
	<i>Burkea africana</i>	9	6.1

**Sampling point 23:**

Coordinates: S 642320 / E 33283699;  
 Slope: 4.5%  
 Dominant tree height: 16 m  
 Basal area (Bitterlich, k=1): 5 m<sup>2</sup>  
 Photos: -  
 Disturbances/notes: -

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Brachystegia spiciformis</i>	24	7.7
	<i>Diplorhynchus condylocarpon</i>	21	13.1
	<i>Brachystegia spiciformis</i>	20	10.2
	<i>Terminalia mollis</i>	36	14.6
DBH < 20 cm	<i>Diplorhynchus condylocarpon</i>	6	7.4
	<i>Brachystegia boehmii</i>	4	2.7
	<i>Pterocarpus angolensis</i>	3	2.8
	<i>Diplorhynchus condylocarpon</i>	4	4.9

**Sampling point 24:**

Coordinates: S 642402 / E 3328312;  
 Slope: 3%  
 Dominant tree height: 17 m  
 Basal area (Bitterlich, k=1): 13 m<sup>2</sup>  
 Photos: -  
 Disturbances/notes: -

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Brachystegia spiciformis</i>	32	13.9
	<i>Brachystegia spiciformis</i>	32	16.6
	<i>Combretum zeyheri</i>	24	9.4
	<i>Brachystegia spiciformis</i>	26	14.4
DBH < 20 cm	<i>Brachystegia stipulata</i>	18	4.3
	<i>Lonchocarpus eriocalyx</i>	15	0.4
	<i>Lonchocarpus eriocalyx</i>	3	3.3
	<i>Brachystegia stipulata</i>	6	4.2

**Sampling point 25:**

Coordinates: S 642496 / E 3328274;  
 Slope: 2%  
 Dominant tree height: 17 m  
 Basal area (Bitterlich, k=1): 11 m<sup>2</sup>

Photos: -  
Disturbances/notes: -

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Brachystegia spiciformis</i>	39	9.1
	<i>Julbernardia globiflora</i>	39	1.6
	<i>Pterocarpus angolensis</i>	42	4.0
	<i>Burkea africana</i>	30	13.7
DBH < 20 cm	<i>Pericopsis angolensis</i>	15	5.1
	<i>Combretum collinum</i>	6	4.9
	<i>Pericopsis angolensis</i>	15	5.9
	<i>Julbernardia globiflora</i>	19	7.7

**Sampling point 26:**

Coordinates: S 642584 / E 3328247;  
Slope: 3%  
Dominant tree height: 16 m  
Basal area (Bitterlich, k=1): 8 m<sup>2</sup>  
Photos: -  
Disturbances/notes: -

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Julbernardia globiflora</i>	29	11.0
	<i>Brachystegia boehmii</i>	29	4.2
	<i>Brachystegia boehmii</i>	29	14.3
	<i>Brachystegia boehmii</i>	34	3.9
DBH < 20 cm	<i>Combretum zeyheri</i>	4	8.0
	<i>Combretum molle</i>	14	11.4
	<i>Julbernardia globiflora</i>	19	7.6
	<i>Commiphora mosambicensis</i>	3	4.2

**Sampling point 27:**

Coordinates: S 643069 / E 3328204;  
Slope: 2%  
Dominant tree height: 14 m  
Basal area (Bitterlich, k=1): 12 m<sup>2</sup>  
Photos: -  
Disturbances/notes: -

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Julbernardia globiflora</i>	22	6.4
	No tree		
	<i>Julbernardia globiflora</i>	26	2.8
	<i>Pericopsis angolensis</i>	25	9.7
DBH < 20 cm	<i>Dalbergia boehmii</i>	6	2.6
	<i>Pseudolachnostylis maprouneifolia</i>	17	2.7
	<i>Cassipourea mollis</i>	9	4.3
	<i>Xylopiantunesii</i>	3	1.9

**Sampling point 28:**

Coordinates: S 643167 / E 3328201;  
Slope: 3%  
Dominant tree height: 15 m  
Basal area (Bitterlich, k=1): 2 m<sup>2</sup>  
Photos: -  
Disturbances/notes: -

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Oldfieldia dactylophylla</i>	30	13.7
	<i>Brachystegia boehmii</i>	30	9.1
	<i>Brachystegia spiciformis</i>	25	10.6
	<i>Brachystegia spiciformis</i>	28	19.6
DBH < 20 cm	<i>Diplorhynchus condylocarpon</i>	4	3.1
	<i>Pterocarpus tinctorius</i>	8	2.3
	<i>Pseudolachnostylis maprouneifolia</i>	4	3.1
	<i>Pterocarpus angolensis</i>	4	3.6

**Sampling point 29:**

Coordinates: S 643265 / E 3328183;

Slope: 2%

Dominant tree height: 16 m

Basal area (Bitterlich, k=1): 12 m<sup>2</sup>

Photos: -

Disturbances/notes: -

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Julbernardia globiflora</i>	28	19.6
	<i>Brachystegia boehmii</i>	40	10.1
	<i>Brachystegia spiciformis</i>	41	7.3
	<i>Julbernardia globiflora</i>	23	12.1
DBH < 20 cm	<i>Diplorhynchus condylocarpon</i>	9	3.4
	<i>Monotes africanus</i>	6	6.3
	<i>Diplorhynchus condylocarpon</i>	15	2.9
	<i>Bauhinia petersiana</i>	7	6.9

**Sampling point 30:**

Coordinates: S 643358 / E 3328187;

Slope: 1%

Dominant tree height: 17 m

Basal area (Bitterlich, k=1): 7 m<sup>2</sup>

Photos: -

Disturbances/notes: -

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	No tree		
	<i>Burkea africana</i>	24	2.1
	<i>Julbernardia globiflora</i>	29	10.2
	<i>Brachystegia spiciformis</i>	42	13.4
DBH < 20 cm	<i>Euphorbia matabelensis</i>	3	4.6
	<i>Diplorhynchus condylocarpon</i>	12	14.7
	<i>Pseudolachnostylis maprouneifolia</i>	17	7.2
	<i>Flacourtia indica</i>	5	12.5

**Mean basal area (Bitterlich, k=1): 9.09 m<sup>2</sup>**

**Dominant tree height: 15.6 m**

## **Transect KT2: Kampumpa section north**

Starting point about 100 steps south of Kululu river (near camp Msua: S 6°29'35.9" / E 33°15'31.4"); direction azimuth: 180°

### **Sampling point 1:**

Coordinates: S 6°29'36.9" / E 33°15'27.3"

Slope: 1-2%, slope exposure: 180°

Dominant tree height: 18 m

Basal area (Bitterlich, k=1): 7 m<sup>2</sup>

Photos: 7304, 7305, 7306, 7307

Disturbances/notes (1-2): 1 *Pericopsis angolensis* cut for timber, 1 *Azelia quanzensis* cut for timber (3 years) (250 steps)

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Brachystegia spiciformis</i>	38	1.90
	<i>Brachystegia spiciformis</i>	24	5.80
	<i>Brachystegia spiciformis</i>	40	2.00
	<i>Brachystegia spiciformis</i>	46	5.60
DBH < 20 cm	<i>Premna</i> sp.	3	2.40
	<i>Diplorhynchus condylocarpon</i>	7	4.70
	<i>Diplorhynchus condylocarpon</i>	4	7.40
	<i>Diplorhynchus condylocarpon</i>	6	5.50

### **Sampling point 2:**

Coordinates: S 6°29'45.4" / E 33°15'24.7"

Slope: 1-2%, slope exposure: 360°

Dominant tree height: 18 m

Basal area (Bitterlich, k=1): 8 m<sup>2</sup>

Photos: 7308, 7309, 7310, 7311

Disturbances/notes (2-3): tree barking 1 *Julbernardia globiflora* (7 years) (0 steps)

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Julbernardia globiflora</i>	23	14.00
	<i>Julbernardia globiflora</i>	31	18.80
	No tree		
	No tree		
DBH < 20 cm	<i>Cassipourea mollis</i>	8	3.00
	<i>Diplorhynchus condylocarpon</i>	8	1.30
	<i>Cassipourea mollis</i>	7	3.50
	<i>Combretum zeyheri</i>	7	2.60

### **Sampling point 3:**

Coordinates: S 6°29'53.0" / E 33°15'24.0"

Slope: +/- flat

Dominant tree height: 14 m

Basal area (Bitterlich, k=1): 3 m<sup>2</sup>

Photos: 7212, 7213, 7214, 7215

Disturbances/notes: -

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	No tree		
	No tree		
	<i>Julbernardia globiflora</i>	59	2.50
	<i>Lannea schimperi</i>	22	9.40
DBH < 20 cm	<i>Combretum collinum</i>	4	7.10
	<i>Combretum collinum</i>	7	6.30
	<i>Combretum molle</i>	7	10.50

	<i>Combretum molle</i>	10	6.90
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**Sampling point 4:**

Coordinates: S 6°30'01.1" / E 33°15'22.0"

Photos: 7320, 7321, 7322, 7323

Mbuga edge not surveyed

**Sampling point 5:**

Coordinates: S 6°30'09.1" / E 33°15'20.7"

Slope: +/- flat

Dominant tree height: 15 m

Basal area (Bitterlich, k=1): 8 m<sup>2</sup>

Photos: 7224, 7225, 7226, 7227

Disturbances/notes (5-6): 1 *Pterocarpus angolensis* and 1 *Brachystegia spiciformis* cut for timber (6 years) (5 steps)

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Combretum molle</i>	20	16.50
	<i>Brachystegia spiciformis</i>	46	14.00
	<i>Brachystegia glaucescens</i>	48	16.00
	<i>Pterocarpus tinctorius</i>	41	5.00
DBH < 20 cm	<i>Pseudolachnostylis maprouneifolia</i>	6	2.50
	<i>Diplorhynchus condylocarpon</i>	10	4.60
	<i>Diplorhynchus condylocarpon</i>	5	5.70
	<i>Pseudolachnostylis maprouneifolia</i>	7	11.30

**Sampling point 6:**

Coordinates: S 6°30'17.2" / E 33°15'18.8"

Slope: +/- flat

Dominant tree height: 16 m

Basal area (Bitterlich, k=1): 13 m<sup>2</sup>

Photos: 7329, 7330, 7331, 7332

Disturbances/notes: -

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Brachystegia spiciformis</i>	27	1.90
	<i>Brachystegia spiciformis</i>	41	5.50
	<i>Brachystegia spiciformis</i>	20	1.90
	<i>Julbernardia globiflora</i>	36	3.70
DBH < 20 cm	<i>Terminalia mollis</i>	3	1.70
	<i>Cassipourea mollis</i>	9	6.90
	<i>Cassipourea mollis</i>	7	5.40
	<i>Cassipourea mollis</i>	10	8.00

**Sampling point 7:**

Coordinates: S 6°30'24.2" / E 33°15'16.2"

Photos: 7333, 7334, 7335, 7336

Mbuga edge not surveyed

**Sampling point 8:**

Coordinates: S 6°30'32.1" / E 33°15'14.7"

Slope: +/- 1%

Dominant tree height: 14 m

Basal area (Bitterlich, k=1): 9 m<sup>2</sup>

Photos: 7337, 7338, 7339, 7340

Disturbances/notes: –

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Julbernardia globiflora</i>	41	10.60
	<i>Brachystegia spiciformis</i>	49	8.10
	<i>Julbernardia globiflora</i>	51	6.00
	<i>Combretum collinum</i>	20	20.00
DBH < 20 cm	<i>Combretum fragrans</i>	7	3.00
	<i>Pseudolachnostylis maprouneifolia</i>	6	10.50
	<i>Combretum fragrans</i>	5	1.10
	<i>Combretum molle</i>	14	16.10

### Sampling point 9:

Coordinates: S 6°30'40.1" / E 33°15'13.8"

Slope: +/- flat

Dominant tree height: 16 m

Basal area (Bitterlich, k=1): 3 m<sup>2</sup>

Photos: 7341, 7342, 7343, 7344

Disturbances/notes: –

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Pericopsis angolensis</i>	29	7.40
	<i>Terminalia sericea</i>	24	18.70
	No tree		
	No tree		
DBH < 20 cm	<i>Pericopsis angolensis</i>	7	6.90
	<i>Combretum collinum</i>	5	10.00
	<i>Julbernardia globiflora</i>	5	6.60
	<i>Brachystegia spiciformis</i>	5	3.10

### Sampling point 10:

Coordinates: S 6°30'47.9' / E 33°15'12.3"

Slope: +/- flat

Dominant tree height: 15 m

Basal area (Bitterlich, k=1): 7.5 m<sup>2</sup>

Photos: 7345, 7346, 7347, 7348

Disturbances/notes: –

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Lannea schimperi</i>	24	10.60
	No tree		
	<i>Pericopsis angolensis</i>	57	2.20
	<i>Brachystegia glaucescens</i>	23	9.10
DBH < 20 cm	<i>Brachystegia glaucescens</i>	3	3.10
	<i>Terminalia sericea</i>	5	11.10
	<i>Burkea africana</i>	4	1.80
	<i>Brachystegia stipulata</i>	6	1.00

### Sampling point 11:

Coordinates: S 6°30'55.7' / E 33°15'11.8"

Slope: +/- flat

Dominant tree height: 16 m

Basal area (Bitterlich, k=1): 3 m<sup>2</sup>

Photos: 7353, 7354, 7355, 7356

Disturbances/notes: –



Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Brachystegia floribunda</i>	37	4.50
	<i>Brachystegia floribunda</i>	59	11.70
	<i>Brachystegia spiciformis</i>	30	17.80
	No tree		
DBH < 20 cm	<i>Terminalia sericea</i>	4	9.40
	<i>Terminalia sericea</i>	11	7.40
	<i>Brachystegia floribunda</i>	17	15.80
	<i>Parinari curatellifolia</i>	7	4.10

**Sampling point 12:**

Coordinates: S 6°31'03.8" / E 33°15'11.4"

Slope: +/- flat

Dominant tree height: 18 m

Basal area (Bitterlich, k=1): 5.5 m<sup>2</sup>

Photos: 7357, 7358, 7359, 7360

Disturbances/notes: –

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Terminalia mollis</i>	22	2.40
	<i>Brachystegia stipulata</i>	22	11.20
	<i>Brachystegia spiciformis</i>	27	19.40
	<i>Burkea africana</i>	35	12.60
DBH < 20 cm	<i>Diplorhynchus condylocarpon</i>	9	6.70
	<i>Julbernardia globiflora</i>	8	7.60
	<i>Diplorhynchus condylocarpon</i>	3	4.10
	<i>Diplorhynchus condylocarpon</i>	3	2.20

**Sampling point 13:**

Coordinates: S 631134 / E 3315135

Slope: 2-3%

Dominant tree height: 13 m

Basal area (Bitterlich, k=1): 10 m<sup>2</sup>

Photos: -

Disturbances/notes: –

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Brachystegia spiciformis</i>	22	10.1
	No tree		
	<i>Brachystegia boehmii</i>	69	16.8
DBH < 20 cm	No tree		
	<i>Brachystegia stipulata</i>	6	2.4
	<i>Combretum molle</i>	4	2.7
	<i>Brachystegia spiciformis</i>	7	1.5
	<i>Brachystegia stipulata</i>	5	2.1

**Sampling point 14:**

Coordinates: S 631230 / E 3315146; probably mbuga, not considered in Miombo analysis

Slope: 1%

Dominant tree height: 11 m

Basal area (Bitterlich, k=1): 0 m<sup>2</sup>

Photos: -

Disturbances/notes: –

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
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DBH ≥ 20 cm	No tree		
	No tree		
	<i>Erythrophleum africanum</i>	29	19.9
	No tree		
DBH < 20 cm	<i>Erythrophleum africanum</i>	6	14.5
	No tree		
	<i>Erythrophleum africanum</i>	5	17.5
	<i>Pseudolachnostylis maprouneifolia</i>	7	19.4

**Sampling point 15:**

Coordinates: S 631327 / E 3315137; mbuga not considered in Miombo analysis

Slope: 1%

Dominant tree height: 0 m

Basal area (Bitterlich, k=1): 0 m<sup>2</sup>

Photos: -

Disturbances/notes: –

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	No tree		
	No tree		
	No tree		
	No tree		
DBH < 20 cm	No tree		
	No tree		
	No tree		
	No tree		

**Sampling point 16:**

Coordinates: S 631423 / E 3315139

Slope: 1-2%

Dominant tree height: 16 m

Basal area (Bitterlich, k=1): 7 m<sup>2</sup>

Photos: -

Disturbances/notes: –

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Terminalia sericea</i>	24	6.0
	<i>Brachystegia boehmii</i>	49	18.4
	<i>Brachystegia longifolia</i>	20	6.8
	<i>Brachystegia floribunda</i>	41	18.3
DBH < 20 cm	<i>Brachystegia floribunda</i>	10	5.5
	<i>Brachystegia boehmii</i>	5	3.5
	<i>Terminalia sericea</i>	3	3.0
	<i>Brachystegia floribunda</i>	3	11.6

**Sampling point 17:**

Coordinates: S 631519 / E 3315128

Slope: 1-2%

Dominant tree height: 14 m

Basal area (Bitterlich, k=1): 7 m<sup>2</sup>

Photos: -

Disturbances/notes: –

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	No tree		
	<i>Brachystegia boehmii</i>	37	15.9

	<i>Julbernardia globiflora</i>	37	9.1
	<i>Pericopsis angolensis</i>	22	8.0
DBH < 20 cm	<i>Pterocarpus angolensis</i>	3	9.8
	<i>Xylopia antunesii</i>	3	12.6
	<i>Terminalia sericea</i>	5	8.7
	<i>Diplorhynchus condylocarpon</i>	12	12.4

**Sampling point 18:**

Coordinates: S 632016 / E 3315112

Slope: 1-2%

Dominant tree height: 15 m

Basal area (Bitterlich, k=1): 3 m<sup>2</sup>

Photos: -

Disturbances/notes: –

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	No tree		
	No tree		
	<i>Brachystegia spiciformis</i>	27	8.2
	<i>Julbernardia globiflora</i>	44	19.6
DBH < 20 cm	<i>Ozoroa insignis</i>	5	2.9
	<i>Pericopsis angolensis</i>	11	11.9
	<i>Xylopia antunesii</i>	4	6.7
	<i>Dalbergia melanoxylon</i>	4	13.4

**Sampling point 19:**

Coordinates: S 632114 / E 3315103

Slope: 1%

Dominant tree height: 16 m

Basal area (Bitterlich, k=1): 9 m<sup>2</sup>

Photos: -

Disturbances/notes: –

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Julbernardia globiflora</i>	34	3.2
	<i>Julbernardia globiflora</i>	25	9.0
	No tree		
	<i>Burkea africana</i>	28	12.4
DBH < 20 cm	<i>Combretum zeyheri</i>	7	7.9
	<i>Diplorhynchus condylocarpon</i>	5	3.5
	<i>Pseudolachnostylis maprouneifolia</i>	7	18.4
	<i>Brachystegia spiciformis</i>	14	2.7

**Sampling point 20:**

Coordinates: S 632210 / E 3315102; Probaby mbuga, not considered in Miombo analysis

Slope: 1%

Dominant tree height: 10 m

Basal area (Bitterlich, k=1): 1 m<sup>2</sup>

Photos: -

Disturbances/notes: –

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	No tree		
	No tree		
	<i>Combretum molle</i>	29	8.0
	No tree		

DBH < 20 cm	<i>Combretum obovatum</i>	3	13.3
	<i>Combretum molle</i>	5	17.9
	<i>Combretum molle</i>	19	19.8
	<i>Combretum collinum</i>	5	19.5

**Sampling point 21:**

Coordinates: S 632308 / E 3315097

Slope: 2-3%

Dominant tree height: 14 m

Basal area (Bitterlich, k=1): 6 m<sup>2</sup>

Photos: -

Disturbances/notes: –

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Pseudolachnostylis maprouneifolia</i>	23	10.3
	<i>Brachystegia spiciformis</i>	35	8.0
	<i>Julbernardia globiflora</i>	31	5.4
	<i>Pseudolachnostylis maprouneifolia</i>	20	13.6
DBH < 20 cm	<i>Terminalia sericea</i>	12	7.5
	<i>Pseudolachnostylis maprouneifolia</i>	4	7.7
	<i>Combretum collinum</i>	3	6.6
	<i>Ochna longipes</i>	7	2.1

**Sampling point 22:**

Coordinates: S 632404 / E 3315097

Slope: 2-3%

Dominant tree height: 15 m

Basal area (Bitterlich, k=1): 7 m<sup>2</sup>

Photos: -

Disturbances/notes: –

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	No tree		
	<i>Combretum collinum</i>	23	5.6
	<i>Brachystegia spiciformis</i>	40	10.0
	<i>Brachystegia spiciformis</i>	36	15.1
DBH < 20 cm	<i>Ximenia americana</i>	12	3.9
	<i>Julbernardia globiflora</i>	5	2.3
	<i>Julbernardia globiflora</i>	5	2.6
	<i>Julbernardia globiflora</i>	4	1.9

**Sampling point 23:**

Coordinates: S 632502 / E 3315102

Slope: 1-2%

Dominant tree height: 14 m

Basal area (Bitterlich, k=1): 7 m<sup>2</sup>

Photos: -

Disturbances/notes: –

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Brachystegia boehmii</i>	37	14.9
	<i>Brachystegia spiciformis</i>	37	6.8
	No tree		
	<i>Pericopsis angolensis</i>	24	11.3
DBH < 20 cm	No tree		
	<i>Combretum collinum</i>	4	3.2

	<i>Terminalia sericea</i>	3	3.3
	<i>Commiphora mosambicensis</i>	14	12.2

**Sampling point 24:**

Coordinates: S 632502 / E 3315121; mbuga not considered in Miombo analysis

Slope: 2-3%

Dominant tree height: 10 m

Basal area (Bitterlich, k=1): 1 m<sup>2</sup>

Photos: -

Disturbances/notes: –

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	No tree		
	<i>Oldfieldia dactylophylla</i>	31	10.3
	No tree		
	No tree		
DBH < 20 cm	<i>Terminalia sericea</i>	5	19.0
	<i>Combretum fragrans</i>	7	7.5
	<i>Combretum fragrans</i>	5	5.1
	<i>Terminalia sericea</i>	9	16.5

**Sampling point 25:**

Coordinates: S 633096 / E 3315120

Slope: 1%

Dominant tree height: 14 m

Basal area (Bitterlich, k=1): 3 m<sup>2</sup>

Photos: -

Disturbances/notes: –

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Brachystegia spiciformis</i>	34	10.4
	No tree		
	<i>Pseudolachnostylis maprouneifolia</i>	20	8.4
	<i>Julbernardia globiflora</i>	32	10.1
DBH < 20 cm	<i>Brachystegia spiciformis</i>	6	3.8
	<i>Brachystegia spiciformis</i>	4	6.3
	<i>Julbernardia globiflora</i>	5	5.4
	<i>Julbernardia globiflora</i>	4	5.4

**Sampling point 26:**

Coordinates: S 633194 / E 3315104

Slope: 2%

Dominant tree height: 12 m

Basal area (Bitterlich, k=1): 2 m<sup>2</sup>

Photos: -

Disturbances/notes: –

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Julbernardia globiflora</i>	29	15.6
	No tree		
	<i>Brachystegia boehmii</i>	29	14.6
DBH < 20 cm	<i>Combretum fragrans</i>	12	12.0
	<i>Combretum fragrans</i>	10	7.2
	No tree		
	<i>Julbernardia globiflora</i>	4	6.3

**Sampling point 27:**

Coordinates: S 633289 / E 3315089

Slope: 1%

Dominant tree height: 15 m

Basal area (Bitterlich, k=1): 7 m<sup>2</sup>

Photos: -

Disturbances/notes: –

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Julbernardia globiflora</i>	34	8.9
	No tree		
	No tree		
DBH < 20 cm	<i>Brachystegia boehmii</i>	8	4.7
	<i>Diplorhynchus condylocarpon</i>	8	2.5
	<i>Brachystegia spiciformis</i>	8	1.7
	<i>Brachystegia spiciformis</i>	9	1.7

**Sampling point 28:**

Coordinates: S 633387 / E 3315076

Slope: 1%

Dominant tree height: 16 m

Basal area (Bitterlich, k=1): 4 m<sup>2</sup>

Photos: -

Disturbances/notes: –

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Julbernardia globiflora</i>	32	20.0
	<i>Pericopsis angolensis</i>	40	6.3
	No tree		
DBH < 20 cm	<i>Julbernardia globiflora</i>	4	2.5
	<i>Brachystegia spiciformis</i>	3	9.6
	<i>Julbernardia globiflora</i>	3	3.8
	<i>Julbernardia globiflora</i>	4	3.4

**Sampling point 29:**

Coordinates: S 633486 / E 3315091

Slope: 2-3%

Dominant tree height: 16 m

Basal area (Bitterlich, k=1): 9 m<sup>2</sup>

Photos: -

Disturbances/notes: –

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Lannea schimperi</i>	20	10.2
	<i>Lannea schimperi</i>	20	8.0
	No tree		
DBH < 20 cm	<i>Julbernardia globiflora</i>	24	6.3
	<i>Brachystegia spiciformis</i>	6	9.2
	<i>Terminalia sericea</i>	13	3.0
	<i>Brachystegia spiciformis</i>	3	3.1
	No tree		



**Sampling point 30:**

Coordinates: S 633582 / E 3315106; mbuga not considered in Miombo analysis

Slope: 2-3%

Dominant tree height: 10 m

Basal area (Bitterlich, k=1): 5 m<sup>2</sup>

Photos: -

Disturbances/notes: –

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	No tree		
	No tree		
	No tree		
	No tree		
DBH < 20 cm	<i>Bauhinia petersiana</i>	11	6.3
	<i>Ozoroa insignis</i>	11	4.6
	<i>Combretum collinum</i>	13	6.3
	<i>Dalbergia melanoxylon</i>	9	7.3

**Mean basal area (Bitterlich, k=1): 6.43 m<sup>2</sup>****Dominant tree height: 15.2 m**

### **Transect KT3: Kapumpa section south**

Starting point southern border Kululu Community Forest Reserve; direction azimuth: 360°

#### **Sampling point 1:**

Coordinates: S 640375 / E 3318281

Slope: 1%

Dominant tree height: 14 m

Basal area (Bitterlich, k=1): 3 m<sup>2</sup>

Photos: -

Disturbances/notes: Grazing (1 animal herd of about 100 cattles)

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Brachystegia boehmii</i>	25	14.0
	<i>Brachystegia spiciformis</i>	36	10.5
	<i>Brachystegia boehmii</i>	22	7.4
	No tree		
DBH < 20 cm	<i>Pterocarpus angolensis</i>	3	12.2
	<i>Pterocarpus angolensis</i>	4	10.4
	<i>Terminalia mollis</i>	17	4.9
	<i>Terminalia sericea</i>	6	10.7

#### **Sampling point 2:**

Coordinates: S 640277 / E 3318290

Slope: 1-2%

Dominant tree height: 16 m

Basal area (Bitterlich, k=1): 9 m<sup>2</sup>

Photos: -

Disturbances/notes: Grazing grounds

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Lannea schimperi</i>	21	11.5
	<i>Pericopsis angolensis</i>	31	12
	<i>Julbernardia globiflora</i>	25	9.8
	<i>Brachystegia boehmii</i>	43	2.5
DBH < 20 cm	<i>Ozoroa insignis</i>	17	6.1
	<i>Monotes africanus</i>	4	11.9
	<i>Pseudolachnostylis maprouneifolia</i>	19	4.0
	No tree		

#### **Sampling point 3:**

Coordinates: S 640179 / E 3318505

Slope: 2%

Dominant tree height: 16 m

Basal area (Bitterlich, k=1): 6 m<sup>2</sup>

Photos: -

Disturbances/notes: -

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Julbernardia globiflora</i>	31	8.9
	<i>Julbernardia globiflora</i>	25	8.3
	<i>Brachystegia spiciformis</i>	40	4.1
	No tree		
DBH < 20 cm	<i>Lonchocarpus capassa</i>	18	3.5
	<i>Combretum collinum</i>	16	14.3
	<i>Lonchocarpus capassa</i>	6	6.3
	<i>Commiphora mosambicensis</i>	8	3.0

**Sampling point 4:**

Coordinates: S 640085 / E 3318323

Slope: 2%

Dominant tree height: 13 m

Basal area (Bitterlich, k=1): 8 m<sup>2</sup>

Photos: -

Disturbances/notes: -

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Pseudolachnostylis maprouneifolia</i>	20	13.5
	<i>Monotes africanus</i>	24	3.6
	<i>Julbernardia globiflora</i>	28	10.2
	No tree		
DBH < 20 cm	<i>Combretum molle</i>	10	1.8
	<i>Lannea schimperi</i>	18	2.6
	<i>Commiphora mosambicensis</i>	11	10.6
	<i>Terminalia sericea</i>	9	9.5

**Sampling point 5:**

Coordinates: S 639587 / E 3318317

Slope: 2-3%

Dominant tree height: 18 m

Basal area (Bitterlich, k=1): 9 m<sup>2</sup>

Photos: -

Disturbances/notes: -

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	No tree		
	<i>Monotes africanus</i>	33	5.8
	<i>Lannea schimperi</i>	23	13.5
	<i>Brachystegia boehmii</i>	41	14.2
DBH < 20 cm	<i>Julbernardia globiflora</i>	9	3.5
	<i>Pterocarpus angolensis</i>	13	3.6
	<i>Strychnos spinosa</i>	6	3.4
	<i>Julbernardia globiflora</i>	13	3

**Sampling point 6:**

Coordinates: S 639490 / E 3318315

Slope: 5%

Dominant tree height: 16 m

Basal area (Bitterlich, k=1): 7 m<sup>2</sup>

Photos: -

Disturbances/notes: -

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Brachystegia longifolia</i>	31	17.0
	<i>Lannea schimperi</i>	24	15.0
	<i>Pericopsis angolensis</i>	41	14.0
	<i>Pseudolachnostylis maprouneifolia</i>	24	6.4
DBH < 20 cm	<i>Vangueriopsis lanciflora</i>	3	9.8
	<i>Euclea schimperi</i>	4	6.2
	<i>Euclea schimperi</i>	3	4.9
	<i>Terminalia sericea</i>	4	6.9

**Sampling point 7:**

Coordinates: S 639394 / E 3318310

Slope: 1%

Dominant tree height: 13 m

Basal area (Bitterlich, k=1): 5 m<sup>2</sup>

Photos: -

Disturbances/notes: -

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Burkea africana</i>	39	20.0
	<i>Lannea schimperi</i>	27	8.2
	<i>Burkea africana</i>	44	9.7
	<i>Lannea schimperi</i>	22	14.5
DBH < 20 cm	<i>Brachystegia boehmii</i>	18	9.7
	<i>Monotes africanus</i>	18	3.5
	<i>Brachystegia boehmii</i>	10	11.4
	<i>Brachystegia boehmii</i>	12	11.4

**Sampling point 8:**

Coordinates: S 639294 / E 3318271

Slope: 1-2%

Dominant tree height: 16 m

Basal area (Bitterlich, k=1): 9 m<sup>2</sup>

Photos: -

Disturbances/notes: -

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Julbernardia globiflora</i>	20	12.7
	<i>Diplorhynchus condylocarpon</i>	20	4.3
	<i>Julbernardia globiflora</i>	25	12.5
	<i>Terminalia mollis</i>	20	5.5
DBH < 20 cm	<i>Pseudolachnostylis maprouneifolia</i>	7	7.0
	<i>Burkea africana</i>	17	0.6
	<i>Cassipourea mollis</i>	12	5.9
	<i>Pseudolachnostylis maprouneifolia</i>	12	4.9

**Sampling point 9:**

Coordinates: S 639196 / E 3318248

Slope: 2%

Dominant tree height: 17 m

Basal area (Bitterlich, k=1): 2 m<sup>2</sup>

Photos: -

Disturbances/notes: Near natural pond (Mwanambuya)

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	No tree		
	<i>Crossopteryx febrifuga</i>	30	13.3
	No tree		
	<i>Terminalia mollis</i>	20	18
DBH < 20 cm	No tree		
	<i>Maytenus senegalensis</i>	13	7.5
	<i>Ozoroa insignis</i>	16	6.9
	<i>Combretum fragrans</i>	3	10.6

**Sampling point 10:**

Coordinates: S 639102 / E 3318236

Slope: 1-2%  
 Dominant tree height: 13 m  
 Basal area (Bitterlich, k=1): 6 m<sup>2</sup>  
 Photos: -  
 Disturbances/notes: Near natural pond (Mwanambuya)

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Brachystegia spiciformis</i>	42	20.0
	<i>Crossopteryx febrifuga</i>	25	15.5
	No tree		
	<i>Julbernardia globiflora</i>	30	9.7
DBH < 20 cm	<i>Combretum collinum</i>	7	4.9
	<i>Commiphora mosambicensis</i>	7	2.4
	<i>Brachystegia spiciformis</i>	4	4.7
	<i>Diplorhynchus condylocarpon</i>	4	8.9

**Sampling point 11:**

Coordinates: S 639007 / E 3318228  
 Slope: 2%  
 Dominant tree height: 16 m  
 Basal area (Bitterlich, k=1): 8 m<sup>2</sup>  
 Photos: -  
 Disturbances/notes: -

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Brachystegia boehmii</i>	60	20.0
	<i>Albizia versicolor</i>	27	9.5
	<i>Pericopsis angolensis</i>	32	11.1
	<i>Pericopsis angolensis</i>	33	7.9
DBH < 20 cm	<i>Ochna longipes</i>	3	2.1
	<i>Crossopteryx febrifuga</i>	3	9.3
	<i>Pseudolachnostylis maprouneifolia</i>	11	3.5
	<i>Lannea schimperi</i>	5	8.0

**Sampling point 12:**

Coordinates: S 638564 / E 3318238  
 Slope: 3-4%  
 Dominant tree height: 17 m  
 Basal area (Bitterlich, k=1): 9 m<sup>2</sup>  
 Photos: -  
 Disturbances/notes: -

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Isoberlinia tomentosa</i>	23	16.9
	<i>Diplorhynchus condylocarpon</i>	22	15.0
	<i>Brachystegia spiciformis</i>	26	3.0
	<i>Monotes africanus</i>	36	11.1
DBH < 20 cm	<i>Ochna longipes</i>	12	3.4
	No tree		
	<i>Pterocarpus angolensis</i>	10	6.3
	<i>Monotes africanus</i>	15	8.5

**Sampling point 13:**

Coordinates: S 638412 / E 3318237  
 Slope: 2-3%  
 Dominant tree height: 15 m

Basal area (Bitterlich, k=1): 12 m<sup>2</sup>

Photos: -

Disturbances/notes: Road (pathway)

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Brachystegia spiciformis</i>	24	6.1
	<i>Burkea africana</i>	20	6.4
	<i>Burkea africana</i>	20	6.5
	<i>Brachystegia spiciformis</i>	21	5.8
DBH < 20 cm	<i>Combretum collinum</i>	5	2.1
	<i>Julbernardia globiflora</i>	5	4.2
	<i>Brachystegia stipulata</i>	12	7.2
	<i>Combretum collinum</i>	5	4.1

#### Sampling point 14:

Coordinates: S 638311 / E 3318249

Slope: 1%

Dominant tree height: 17 m

Basal area (Bitterlich, k=1): 7 m<sup>2</sup>

Photos: -

Disturbances/notes: -

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Brachystegia spiciformis</i>	21	3.8
	<i>Julbernardia globiflora</i>	44	19.8
	No tree		
	<i>Brachystegia spiciformis</i>	51	4.8
DBH < 20 cm	<i>Diplorhynchus condylocarpon</i>	4	2.8
	<i>Diplorhynchus condylocarpon</i>	6	3.5
	<i>Julbernardia globiflora</i>	5	4.5
	<i>Diplorhynchus condylocarpon</i>	7	4.0

#### Sampling point 15:

Coordinates: S 638218 / E 3318249

Slope: 1%

Dominant tree height: 18 m

Basal area (Bitterlich, k=1): 3 m<sup>2</sup>

Photos: -

Disturbances/notes: -

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Combretum molle</i>	33	12.5
	<i>Julbernardia globiflora</i>	20	16.3
	<i>Pterocarpus angolensis</i>	52	9
	<i>Julbernardia globiflora</i>	31	11.1
DBH < 20 cm	No tree		
	<i>Dalbergia boehmii</i>	3	14.7
	No tree		
	<i>Combretum molle</i>	13	14.2

#### Sampling point 16:

Coordinates: S 638121 / E 3318271

Slope: 2-3%

Dominant tree height: 17 m

Basal area (Bitterlich, k=1): 13 m<sup>2</sup>

Photos: -



Disturbances/notes: -

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Julbernardia globiflora</i>	46	4.5
	<i>Brachystegia spiciformis</i>	33	5.6
	<i>Julbernardia globiflora</i>	36	7.5
	No tree		
DBH < 20 cm	<i>Diplorhynchus condylocarpon</i>	4	3.2
	<i>Pseudolachnostylis maprouneifolia</i>	15	6.6
	<i>Diplorhynchus condylocarpon</i>	7	4.1
	<i>Pseudolachnostylis maprouneifolia</i>	19	11.5

**Sampling point 17:**

Coordinates: S 638024 / E 3318289

Slope: 1%

Dominant tree height: 18 m

Basal area (Bitterlich, k=1): 12 m<sup>2</sup>

Photos: -

Disturbances/notes: Road (pathway)

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Brachystegia spiciformis</i>	27	11.0
	<i>Brachystegia boehmii</i>	42	14.6
	<i>Brachystegia spiciformis</i>	23	2.0
	<i>Julbernardia globiflora</i>	33	7.6
DBH < 20 cm	<i>Diplorhynchus condylocarpon</i>	6	4.5
	<i>Diplorhynchus condylocarpon</i>	6	5.6
	<i>Combretum collinum</i>	3	3.4
	<i>Brachystegia spiciformis</i>	6	9.0

**Sampling point 18:**

Coordinates: S 637533 / E 3318321

Slope: 5%

Dominant tree height: 18 m

Basal area (Bitterlich, k=1): 10 m<sup>2</sup>

Photos: -

Disturbances/notes: -

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Brachystegia boehmii</i>	28	6.7
	<i>Julbernardia globiflora</i>	36	8.1
	<i>Pseudolachnostylis maprouneifolia</i>	25	10.6
	No tree		
DBH < 20 cm	<i>Diplorhynchus condylocarpon</i>	10	1.4
	<i>Julbernardia globiflora</i>	4	6.8
	<i>Diplorhynchus condylocarpon</i>	6	3.1
	<i>Schrebera trichoclada</i>	4	4.2

**Sampling point 19:**

Coordinates: S 637436 / E 3318333; mbuga not considered in Miombo analysis

Slope: 1%

Dominant tree height: 8 m

Basal area (Bitterlich, k=1): 1 m<sup>2</sup>

Photos: -

Disturbances/notes: -

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Crossopteryx febrifuga</i>	20	11.1
	No tree		
DBH < 20 cm	<i>Terminalia sericea</i>	24	19.7
	<i>Commiphora mollis</i>	20	9.1
	<i>Acacia drepanolobium</i>	10	9.3
	<i>Acacia drepanolobium</i>	3	13.1
	<i>Combretum collinum</i>	8	11.3
	<i>Entada abyssinica</i>	15	18.0

**Sampling point 20:**

Coordinates: S 637340 / E 3318344

Slope: 2%

Dominant tree height: 18 m

Basal area (Bitterlich, k=1): 6 m<sup>2</sup>

Photos: -

Disturbances/notes: Road (pathway)

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Pterocarpus angolensis</i>	27	5.6
	<i>Strychnos spinosa</i>	23	11.3
	<i>Isobertia tomentosa</i>	27	19.3
	<i>Brachystegia floribunda</i>	33	17.0
DBH < 20 cm	<i>Strychnos spinosa</i>	3	2.9
	<i>Diplorhynchus condylocarpon</i>	7	4.0
	<i>Julbernardia globiflora</i>	7	2.4
	<i>Strychnos spinosa</i>	7	4.6

**Sampling point 21:**

Coordinates: S 637243 / E 3318350

Slope: 2%

Dominant tree height: 14 m

Basal area (Bitterlich, k=1): 9 m<sup>2</sup>

Photos: -

Disturbances/notes: -

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Brachystegia boehmii</i>	30	12.1
	<i>Brachystegia spiciformis</i>	43	15.9
	<i>Monotes africanus</i>	26	12.8
	<i>Pseudolachnostylis maprouneifolia</i>	32	12
DBH < 20 cm	<i>Brachystegia spiciformis</i>	3	3
	<i>Brachystegia boehmii</i>	3	4.1
	<i>Lannea schimperi</i>	10	10.1
	<i>Pseudolachnostylis maprouneifolia</i>	10	4.7

**Sampling point 22:**

Coordinates: S 637146 / E 3318356

Slope: 1%

Dominant tree height: 15 m

Basal area (Bitterlich, k=1): 8 m<sup>2</sup>

Photos: -

Disturbances/notes: -

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
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DBH ≥ 20 cm	<i>Schrebera trichoclada</i>	22	13.3
	<i>Lannea schimperi</i>	20	3.6
	No tree		
	<i>Brachystegia boehmii</i>	22	6.4
DBH < 20 cm	<i>Julbernardia globiflora</i>	9	14.4
	<i>Commiphora mosambicensis</i>	5	4.4
	<i>Terminalia mollis</i>	15	11.9
	<i>Lannea schimperi</i>	9	5.5

**Sampling point 23:**

Coordinates: S 637050 / E 3318370

Slope: 1-2%

Dominant tree height: 16 m

Basal area (Bitterlich, k=1): 10 m<sup>2</sup>

Photos: -

Disturbances/notes: -

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Burkea africana</i>	20	1.3
	<i>Monotes africanus</i>	33	3.2
	<i>Brachystegia spiciformis</i>	37	11.4
	<i>Pterocarpus angolensis</i>	28	2.7
DBH < 20 cm	<i>Diplorhynchus condylocarpon</i>	12	2.7
	<i>Schrebera trichoclada</i>	4	6.8
	<i>Commiphora mosambicensis</i>	3	14.0
	<i>Schrebera trichoclada</i>	3	6.7

**Sampling point 24:**

Coordinates: S 636556 / E 3318394

Slope: 1-2%

Dominant tree height: 16 m

Basal area (Bitterlich, k=1): 9 m<sup>2</sup>

Photos: -

Disturbances/notes: -

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Julbernardia globiflora</i>	34	8.3
	<i>Monotes africanus</i>	22	8.1
	<i>Julbernardia globiflora</i>	44	12.7
	<i>Lannea schimperi</i>	20	5.6
DBH < 20 cm	<i>Diplorhynchus condylocarpon</i>	12	8.4
	<i>Pseudolachnostylis maprouneifolia</i>	9	3.4
	<i>Brachystegia spiciformis</i>	19	11.0
	<i>Schrebera trichoclada</i>	10	9.6

**Sampling point 25:**

Coordinates: S 636457 / E 3318385

Slope: 2%

Dominant tree height: 17 m

Basal area (Bitterlich, k=1): 8 m<sup>2</sup>

Photos: -

Disturbances/notes: -

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Lannea schimperi</i>	22	11.4

	No tree		
	<i>Julbernardia globiflora</i>	50	4.3
	<i>Burkea africana</i>	33	3.5
DBH < 20 cm	<i>Julbernardia globiflora</i>	5	5
	<i>Pericopsis angolensis</i>	12	9.4
	<i>Diplorhynchus condylocarpon</i>	13	12.9
	<i>Combretum collinum</i>	11	10.2

**Sampling point 26:**

Coordinates: S 636365 / E 3318392; probably mbuga, not considered in Miombo analysis

Slope: 1%

Dominant tree height: 10 m

Basal area (Bitterlich, k=1): 1 m<sup>2</sup>

Photos: -

Disturbances/notes: -

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	No tree		
	No tree		
	No tree		
	<i>Combretum molle</i>	27	18.7
DBH < 20 cm	<i>Lannea schimperi</i>	19	7.1
	No tree		
	<i>Catunaregam spinosa</i>	16	9.1
	No tree		

**Sampling point 27:**

Coordinates: S 636261 / E 3318400

Slope: 2%

Dominant tree height: 15 m

Basal area (Bitterlich, k=1): 7 m<sup>2</sup>

Photos: -

Disturbances/notes: -

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Brachystegia spiciformis</i>	39	7.4
	No tree		
	<i>Julbernardia globiflora</i>	43	11.6
	<i>Combretum molle</i>	36	9.2
DBH < 20 cm	<i>Combretum collinum</i>	4	10.5
	<i>Pseudolachnostylis maprouneifolia</i>	14	7.5
	<i>Xylopiantunesii</i>	6	5.4
	<i>Xylopiantunesii</i>	7	8.5

**Sampling point 28:**

Coordinates: S 636165 / E 3318366

Slope: 3%

Dominant tree height: 14 m

Basal area (Bitterlich, k=1): 6 m<sup>2</sup>

Photos: -

Disturbances/notes: -

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Brachystegia spiciformis</i>	28	12.1
	<i>Pericopsis angolensis</i>	23	9.7

	No tree		
	<i>Pseudolachnostylis maprouneifolia</i>	23	7.9
DBH < 20 cm	<i>Diplorhynchus condylocarpon</i>	8	13.6
	<i>Terminalia sericea</i>	3	9.0
	<i>Schrebera trichoclada</i>	9	4.8
	<i>Cassipourea mollis</i>	5	12.0

**Sampling point 29:**

Coordinates: S 636068 / E 3318318

Slope: 5%

Dominant tree height: 14 m

Basal area (Bitterlich, k=1): 7 m<sup>2</sup>

Photos: -

Disturbances/notes: -

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Brachystegia boehmii</i>	28	11.0
	<i>Brachystegia boehmii</i>	35	4.6
	<i>Brachystegia stipulata</i>	21	7.5
	<i>Julbernardia globiflora</i>	33	8.9
DBH < 20 cm	<i>Lonchocarpus capassa</i>	5	10.6
	<i>Lonchocarpus capassa</i>	5	15
	<i>Ochna longipes</i>	5	7.6
	<i>Commiphora mosambicensis</i>	7	11.5

**Sampling point 30:**

Coordinates: S 635575 / E 3318318

Slope: 2-3%

Dominant tree height: 15 m

Basal area (Bitterlich, k=1): 5 m<sup>2</sup>

Photos: -

Disturbances/notes: -

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Pseudolachnostylis maprouneifolia</i>	23	3.4
	<i>Pericopsis angolensis</i>	21	13.7
	<i>Pericopsis angolensis</i>	23	11.1
	<i>Pseudolachnostylis maprouneifolia</i>	30	11.5
DBH < 20 cm	<i>Combretum collinum</i>	9	15.5
	<i>Pericopsis angolensis</i>	19	13.5
	No tree		
	<i>Combretum collinum</i>	5	13.7

**Mean basal area (Bitterlich, k=1): 7.61 m<sup>2</sup>**

**Dominant tree height: 15.8 m**

## Appendix B: Vegetation transect in Rungwa River Forest Reserve

### Transect RT1:

Starting point about 100 steps north of Rungwa river (near fishermen camp: S 7°08'30.0" / E 32°26'50.9"); direction azimuth: 360°

#### Sampling point 1:

Coordinates: S 7°08'10.6" / E 32°27'15.7"

Slope: 2-4%, slope exposure: 165°

Dominant tree height: 6 m

Basal area (Bitterlich, k=1): 6.5 m<sup>2</sup>

Photos: 7366, 7367, 7368, 7369

Disturbances/notes: open vegetation

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	No tree		
	No tree		
	No tree		
	No tree		
DBH < 20 cm	<i>Combretum fragrans</i>	7	2.80
	<i>Terminalia sericea</i>	5	1.80
	<i>Terminalia sericea</i>	10	2.30
	<i>Combretum fragrans</i>	5	3.00

#### Sampling point 2:

Coordinates: S 7°08'02.6" / E 32°27'15.5"

Slope: 3-4%, slope exposure: 135°

Dominant tree height: 6 (8) m

Basal area (Bitterlich, k=1): 3 m<sup>2</sup>

Photos: 7370, 7371, 7372, 7373

Disturbances/notes: open vegetation

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	No tree		
	No tree		
	No tree		
	No tree		
DBH < 20 cm	<i>Combretum zeyheri</i>	4	6.00
	<i>Terminalia mollis</i>	4	5.60
	<i>Flueggea virosa</i>	3	2.25
	<i>Combretum fragrans</i>	6	4.60

#### Sampling point 3:

Coordinates: S 7°07'54.9" / E 32°27'16.8"

Slope: 2-3%, slope exposure: 135°

Dominant tree height: 5 (8) m

Basal area (Bitterlich, k=1): 3 m<sup>2</sup>

Photos: 7374, 7375, 7376, 7377

Disturbances/notes: open vegetation

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	No tree		
	No tree		
	No tree		
	No tree		
DBH < 20 cm	<i>Bauhinia petersiana</i>	4	3.20



	<i>Acacia drepanolobium</i>	3	2.30
	<i>Bauhinia petersiana</i>	3	4.00
	<i>Bauhinia petersiana</i>	4	1.65

**Sampling point 4:**

Coordinates: S 7°07'47.0" / E 32°27'17.1"

Slope: 1-2%, slope exposure: 270°

Dominant tree height: 7 m

Basal area (Bitterlich, k=1): 2 m<sup>2</sup>

Photos: 7378, 7379, 7380, 7381

Disturbances/notes: open vegetation

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	No tree		
	No tree		
	No tree		
	No tree		
DBH < 20 cm	<i>Terminalia mollis</i>	6	4.40
	<i>Terminalia mollis</i>	15	4.30
	<i>Terminalia mollis</i>	6	6.20
	<i>Commiphora africana</i>	6	1.95

**Sampling point 5:**

Coordinates: S 7°07'39.2" / E 32°27'18.1"

Slope: 1-2%, slope exposure: 70°

Dominant tree height: 5 m

Basal area (Bitterlich, k=1): 0 m<sup>2</sup>

Photos: 7382, 7383, 7384, 7385

Disturbances/notes: open vegetation

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	No tree		
	No tree		
	No tree		
	No tree		
DBH < 20 cm	<i>Combretum fragrans</i>	5	7.40
	<i>Combretum fragrans</i>	5	4.10
	<i>Bauhinia petersiana</i>	4	2.85
	<i>Terminalia sericea</i>	5	10.90

**Sampling point 6:**

Coordinates: S 7°07'31.1" / E 32°27'19.4"

Slope: 2%, slope exposure: 250°

Dominant tree height: 4 (5) m

Basal area (Bitterlich, k=1): 2 m<sup>2</sup>

Photos: 7386, 7387, 7388, 7389

Disturbances/notes: open vegetation

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	No tree		
	No tree		
	No tree		
	No tree		
DBH < 20 cm	<i>Terminalia mollis</i>	4	11.00
	<i>Combretum fragrans</i>	6	1.75
	<i>Combretum fragrans</i>	9	10.90

	<i>Terminalia mollis</i>	5	6.40
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**Sampling point 7:**

Coordinates: S 7°07'23.1" / E 32°27'19.5"

Slope: 2-3%, slope exposure: 270°

Dominant tree height: 5 m

Basal area (Bitterlich, k=1): 1 m<sup>2</sup>

Photos: 7390, 7391, 7392, 7393

Disturbances/notes: open vegetation

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	No tree		
	No tree		
	No tree		
	No tree		
DBH < 20 cm	<i>Combretum fragrans</i>	16	9.70
	<i>Bauhinia petersiana</i>	3	10.50
	<i>Bauhinia petersiana</i>	4	2.60
	<i>Combretum fragrans</i>	5	7.40

**Sampling point 8:**

Coordinates: S 7°07'15.3" / E 32°27'19.3"

Slope: 2%, slope exposure: 270°

Dominant tree height: 6 m

Basal area (Bitterlich, k=1): 3 m<sup>2</sup>

Photos: 7394, 7395, 7396, 7397

Disturbances/notes: open vegetation

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	No tree		
	No tree		
	No tree		
	No tree		
DBH < 20 cm	<i>Bauhinia petersiana</i>	8	9.90
	<i>Lannea schimperi</i>	16	5.70
	<i>Combretum molle</i>	13	7.20
	<i>Combretum molle</i>	7	1.90

**Sampling point 9:**

Coordinates: S 7°07'06.2" / E 32°27'19.5"

Slope: 2%, slope exposure: 200°

Dominant tree height: 6 m

Basal area (Bitterlich, k=1): 1.5 m<sup>2</sup>

Photos: 7399, 7400, 7401, 7402

Disturbances/notes: open vegetation

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	No tree		
	No tree		
	No tree		
	No tree		
DBH < 20 cm	<i>Combretum fragrans</i>	15	8.15
	<i>Acacia drepanolobium</i>	3	5.80
	<i>Cassia singueana</i>	6	1.90
	<i>Bauhinia petersiana</i>	4	5.10

**Sampling point 10:**

Coordinates: S 7°06'58.2" / E 32°27'19.4"

Slope: 2%, slope exposure: 140°

Dominant tree height: 13m

Basal area (Bitterlich, k=1): 4 m<sup>2</sup>

Photos: 7403, 7404, 7405, 7406

Disturbances/notes: open vegetation

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	No tree		
	<i>Pericopsis angolensis</i>	50	10.20
	No tree		
	No tree		
DBH < 20 cm	<i>Pseudolachnostylis maprouneifolia</i>	13	2.40
	<i>Combretum molle</i>	10	8.50
	<i>Combretum fragrans</i>	10	5.40
	<i>Combretum fragrans</i>	8	11.50

**Sampling point 11:**

Coordinates: S 7°06'50.1" / E 32°27'19.9"

Slope: 0-1%, slope exposure: 340°

Dominant tree height: 12 m

Basal area (Bitterlich, k=1): 3.5 m<sup>2</sup>

Photos: 7412, 7413, 7414, 7415

Disturbances/notes (11-12): 1 *Brachystegia spiciformis* cut for harvesting wild honey (2020) (120 steps), 1 *Pterocarpus angolensis* cut for harvesting wild honey (2020) (200 steps);

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	No tree		
	<i>Julbernardia globiflora</i>	27	17.40
	<i>Julbernardia globiflora</i>	28	16.80
	No tree		
DBH < 20 cm	<i>Combretum zeyheri</i>	13	4.80
	<i>Brachystegia stipulata</i>	17	4.00
	<i>Brachystegia stipulata</i>	7	3.25
	<i>Brachystegia stipulata</i>	5	2.60

**Sampling point 12:**

Coordinates: S 7°06'42.1" / E 32°27'20.9"

Slope: +/- flat

Dominant tree height: 16 m

Basal area (Bitterlich, k=1): 4.5 m<sup>2</sup>

Photos: 7416, 7417, 7418, 7419

Disturbances/notes (12-13): Camp wild honey harvester (2020) (150 steps)

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	No tree		
	<i>Oldfieldia dactylophylla</i>	23	5.20
	<i>Julbernardia globiflora</i>	30	12.30
	<i>Burkea africana</i>	32	11.15
DBH < 20 cm	<i>Terminalia sericea</i>	8	5.90
	<i>Terminalia sericea</i>	13	2.40
	<i>Combretum collinum</i>	9	4.90
	<i>Hymenocardia acida</i>	4	3.55

**Sampling point 13:**

Coordinates: S 7°06'33.7" / E 32°27'21.4"

Slope: 1%, slope exposure: 270°

Dominant tree height: 11 m

Basal area (Bitterlich, k=1): 4 m<sup>2</sup>

Photos: 7420, 7421, 7422, 7423

Disturbances/notes: -

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	No tree		
	<i>Sclerocarya birrea</i>	28	17.50
	No tree		
	<i>Terminalia sericea</i>	20	19.80
DBH < 20 cm	<i>Combretum zeyheri</i>	5	3.05
	<i>Brachystegia stipulata</i>	8	0.85
	<i>Brachystegia stipulata</i>	3	2.10
	<i>Diplorhynchus condylocarpon</i>	5	3.30

**Sampling point 14:**

Coordinates: S 7°06'25.4" / E 32°27'22.2"

Slope: 1-2%, slope exposure: 320°

Dominant tree height: 10 m

Basal area (Bitterlich, k=1): 3 m<sup>2</sup>

Photos: 7424, 7425, 7426, 7427

Disturbances/notes: -

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Combretum molle</i>	23	16.25
	<i>Terminalia sericea</i>	23	16.10
	No tree		
	<i>Combretum molle</i>	20	7.90
DBH < 20 cm	<i>Acacia drepanolobium</i>	5	3.20
	<i>Combretum molle</i>	10	8.50
	<i>Combretum molle</i>	8	3.70
	<i>Terminalia mollis</i>	6	7.05

**Sampling point 15:**

Coordinates: S 7°06'16.7" / E 32°27'22.7"

Slope: 1-2%, slope exposure: 270°

Dominant tree height: 9 m

Basal area (Bitterlich, k=1): 2.5 m<sup>2</sup>

Photos: 7428, 7429, 7430, 7431

Disturbances/notes (15-16): Tree harvesting with permit stopped in 2018 (280 steps)

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Combretum molle</i>	20	7.10
	<i>Terminalia mollis</i>	23	13.00
	<i>Terminalia mollis</i>	23	18.60
	<i>Commiphora africana</i>	20	15.50
DBH < 20 cm	<i>Bauhinia petersiana</i>	5	3.10
	<i>Bauhinia petersiana</i>	3	2.90
	<i>Combretum fragrans</i>	5	8.80
	<i>Combretum fragrans</i>	10	9.40

**Sampling point 16:**

Coordinates: S 7°06'08.6" / E 32°27'22.5"

Slope: 1-2%, slope exposure: 225°  
 Dominant tree height: 12 m  
 Basal area (Bitterlich, k=1): 5.5 m<sup>2</sup>  
 Photos: 7435, 7436, 7437, 7438  
 Disturbances/notes: -

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Terminalia mollis</i>	22	12.80
	<i>Brachystegia spiciformis</i>	23	16.90
	<i>Brachystegia spiciformis</i>	32	9.90
	No tree		
DBH < 20 cm	<i>Combretum molle</i>	3	9.40
	<i>Crossopterix febrifuga</i>	8	4.40
	<i>Combretum zeyheri</i>	15	4.60
	<i>Julbernardia globiflora</i>	8	6.50

**Sampling point 17:**

Coordinates: S 7°06'00.6" / E 32°27'24.1"  
 Slope: 1-2%, slope exposure: 320°  
 Dominant tree height: 8 m  
 Basal area (Bitterlich, k=1): 1.5 m<sup>2</sup>  
 Photos: 7439, 7440, 7441, 7442  
 Disturbances/notes: open vegetation

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Lannea schimperi</i>	23	14.40
	<i>Combretum zeyheri</i>	27	15.50
	No tree		
	No tree		
DBH < 20 cm	<i>Combretum molle</i>	14	6.00
	<i>Combretum molle</i>	18	14.40
	<i>Terminalia mollis</i>	17	13.20
	<i>Bauhinia petersiana</i>	4	7.80

**Sampling point 18:**

Coordinates: S 7°05'52.7" / E 32°27'22.3"  
 Slope: 1-2%, slope exposure: 210°  
 Dominant tree height: 7 m  
 Basal area (Bitterlich, k=1): 2 m<sup>2</sup>  
 Photos: 7443, 7444, 7445, 7446  
 Disturbances/notes: open vegetation

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	No tree		
	No tree		
	No tree		
	No tree		
DBH < 20 cm	<i>Combretum molle</i>	4	4.10
	<i>Terminalia mollis</i>	4	3.80
	<i>Terminalia mollis</i>	18	11.70
	<i>Terminalia mollis</i>	10	2.90

**Sampling point 19:**

Coordinates: S 7°05'44.5" / E 32°27'22.6"  
 Slope: 0-1%, slope exposure: 180°  
 Dominant tree height: 9 m

Basal area (Bitterlich, k=1): 2 m<sup>2</sup>  
 Photos: 7462, 7463, 7464, 7465  
 Disturbances/notes: open vegetation

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Terminalia mollis</i>	24	12.50
	<i>Terminalia mollis</i>	26	16.00
	No tree		
	No tree		
DBH < 20 cm	<i>Terminalia mollis</i>	13	7.50
	<i>Acacia drepanolobium</i>	4	3.70
	<i>Sclerocarya birrea</i>	4	6.70
	<i>Combretum zeyheri</i>	12	4.70

**Sampling point 20:**

Coordinates: S 7°05'36.5" / E 32°27'22.6"  
 Slope: 0-1%, slope exposure: 220°  
 Dominant tree height: 9 m  
 Basal area (Bitterlich, k=1): 4 m<sup>2</sup>  
 Photos: 7466, 7467, 7468, 7469  
 Disturbances/notes: open vegetation

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	No tree		
	No tree		
	<i>Combretum molle</i>	24	11.20
	<i>Terminalia mollis</i>	20	5.10
DBH < 20 cm	<i>Terminalia mollis</i>	16	1.30
	<i>Acacia drepanolobium</i>	4	4.05
	<i>Terminalia mollis</i>	3	1.60
	<i>Combretum fragrans</i>	4	1.30

**Sampling point 21:**

Coordinates: S 7°05'28.4" / E 32°27'23.3"  
 Slope: 1%, slope exposure: 220°  
 Dominant tree height: 13 m  
 Basal area (Bitterlich, k=1): 2 m<sup>2</sup>  
 Photos: 7470, 7471, 7472, 7473  
 Disturbances/notes: open vegetation

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Terminalia sericea</i>	25	20.00
	No tree		
	No tree		
	No tree		
DBH < 20 cm	<i>Brachystegia stipulata</i>	5	7.70
	<i>Terminalia sericea</i>	10	7.50
	<i>Lonchocarpus capassa</i>	6	2.90
	<i>Pseudolachnostylis maprouneifolia</i>	10	5.30

**Sampling point 22:**

Coordinates: S 7°05'20.4" / E 32°27'24.1"  
 Slope: 0-2%, slope exposure: 220°  
 Dominant tree height: 16 m  
 Basal area (Bitterlich, k=1): 9 m<sup>2</sup>  
 Photos: 7474, 7475, 7476, 7477

Disturbances/notes (22-23): (250-270 steps): 1 *Julbernardia globiflora* cut for wild honey harvesting (2 years), 1 *Julbernardia globiflora* cut for harvesting wild honey (the day before), 1 *Pterocarpus angolensis* cut for timber (6 years)

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Manilkara mochisia</i>	35	17.00
	No tree		
	<i>Julbernardia globiflora</i>	35	19.30
	<i>Pseudolachnostylis maprouneifolia</i>	25	5.40
DBH < 20 cm	<i>Diplorhynchus condylocarpon</i>	7	3.60
	<i>Brachystegia spiciformis</i>	10	1.90
	<i>Julbernardia globiflora</i>	6	2.00
	<i>Terminalia sericea</i>	12	7.40

### Sampling point 23:

Coordinates: S 7°05'12.7" / E 32°27'24.6"

Slope: 1-2%, slope exposure: 300°

Dominant tree height: 13 m

Basal area (Bitterlich, k=1): 8.5 m<sup>2</sup>

Photos: 7478, 7479, 7480, 7481

Disturbances/notes: -

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Julbernardia globiflora</i>	31	6.60
	<i>Julbernardia globiflora</i>	26	8.90
	<i>Julbernardia globiflora</i>	31	7.90
	<i>Julbernardia globiflora</i>	26	7.40
DBH < 20 cm	<i>Combretum zeyheri</i>	8	8.80
	<i>Combretum zeyheri</i>	14	2.70
	<i>Diplorhynchus condylocarpon</i>	4	12.10
	<i>Combretum zeyheri</i>	10	4.40

### Sampling point 24:

Coordinates: S 7°05'05.1" / E 32°27'25.8"

Slope: 2-3%, slope exposure: 360°

Dominant tree height: 14 m

Basal area (Bitterlich, k=1): 7.5 m<sup>2</sup>

Photos: 7482, 7483, 7484, 7485

Disturbances/notes (24-25): 1 *Julbernardia globiflora* tree barking (2020) (280 steps)

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Julbernardia globiflora</i>	35	0.80
	No tree		
	<i>Pterocarpus angolensis</i>	22	4.25
	<i>Julbernardia globiflora</i>	24	10.40
DBH < 20 cm	<i>Cassipourea mollis</i>	11	3.80
	<i>Pterocarpus angolensis</i>	10	1.30
	<i>Pterocarpus angolensis</i>	15	3.20
	<i>Pterocarpus angolensis</i>	5	2.70

### Sampling point 25:

Coordinates: S 7°04'54.2" / E 32°27'27.4"

Slope: 1-2%, slope exposure: 300°

Dominant tree height: 13 m

Basal area (Bitterlich, k=1): 6 m<sup>2</sup>

Photos: 7486, 7487, 7488, 7489



Disturbances/notes: -

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Combretum fragrans</i>	27	1.10
	No tree		
	<i>Julbernardia globiflora</i>	43	15.00
	<i>Combretum molle</i>	24	14.10
DBH < 20 cm	<i>Combretum fragrans</i>	15	6.30
	<i>Julbernardia globiflora</i>	5	4.10
	<i>Combretum fragrans</i>	12	4.00
	<i>Combretum fragrans</i>	9	6.90

**Sampling point 26:**

Coordinates: S 7°04'45.8" / E 32°27'27.0"

Slope: 0-1%, slope exposure: 140°

Dominant tree height: 4(5) m

Basal area (Bitterlich, k=1): 2 m<sup>2</sup>

Photos: 7490, 7491, 7492, 7493

Disturbances/notes: open vegetation

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	No tree		
	No tree		
	No tree		
	No tree		
DBH < 20 cm	<i>Combretum fragrans</i>	5	0.35
	<i>Combretum fragrans</i>	3	3.60
	<i>Combretum fragrans</i>	6	4.40
	<i>Combretum fragrans</i>	7	3.80

**Sampling point 27:**

Coordinates: S 7°04'37.2" / E 32°27'28.2"

Slope: +/- flat

Dominant tree height: 4 m

Basal area (Bitterlich, k=1): 1 m<sup>2</sup>

Photos: 7494, 7495, 7496, 7497

Disturbances/notes: open vegetation

Diameter class	Nearest species in the each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	No tree		
	No tree		
	No tree		
	No tree		
DBH < 20 cm	<i>Combretum fragrans</i>	10	17.50
	<i>Combretum fragrans</i>	10	3.00
	<i>Combretum fragrans</i>	6	8.90
	<i>Combretum fragrans</i>	4	5.70

**Sampling point 28:**

Coordinates: S 7°04'28.3" / E 32°27'27.4"

Slope: +/- flat

Dominant tree height: 4(10) m

Basal area (Bitterlich, k=1): 2 m<sup>2</sup>

Photos: 7498, 7499, 7500, 7501

Disturbances/notes: open vegetation

Diameter class	Nearest species in the each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	No tree		
	No tree		
	No tree		
	No tree		
DBH < 20 cm	<i>Combretum fragrans</i>	11	4.90
	<i>Combretum fragrans</i>	4	3.00
	<i>Combretum fragrans</i>	6	8.10
	<i>Combretum fragrans</i>	4	7.20

**Sampling point 29:**

Coordinates: S 7°04'18.9" / E 32°27'26.8"

Slope: +/- flat

Dominant tree height: 5 m

Basal area (Bitterlich, k=1): 0 m<sup>2</sup>

Photos: 7506, 7507, 7508, 7509

Disturbances/notes: open vegetation

Diameter class	Nearest species in the each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	No tree		
	No tree		
	No tree		
	No tree		
DBH < 20 cm	<i>Combretum fragrans</i>	5	11.60
	<i>Bauhinia petersiana</i>	4	10.00
	<i>Combretum fragrans</i>	8	12.50
	<i>Combretum fragrans</i>	5	9.00

**Sampling point 30:**

Coordinates: S 7°04'09.9" / E 32°27'25.7"

Slope: 1-2%; slope exposure: 210°

Dominant tree height: 6(8) m

Basal area (Bitterlich, k=1): 1.5 m<sup>2</sup>

Photos: 7510, 7511, 7512, 7513

Disturbances/notes: open vegetation

Diameter class	Nearest species in the each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	No tree		
	No tree		
	No tree		
	No tree		
DBH < 20 cm	<i>Combretum fragrans</i>	6	2.60
	<i>Bauhinia petersiana</i>	4	12.10
	<i>Bauhinia petersiana</i>	7	14.80
	<i>Combretum fragrans</i>	5	6.00

**Sampling point 31:**

Coordinates: S 7°04'01.3" / E 32°27'26.5"

Slope: 1-3%; slope exposure: 220°

Dominant tree height: 8 (Tamarindus 14) m

Basal area (Bitterlich, k=1): 3 m<sup>2</sup>

Photos: 7514, 7515, 7516, 7517

Disturbances/notes: -

Diameter class	Nearest species in the each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	No tree		

	<i>Combretum zeyheri</i>	25	7.50
	<i>Combretum molle</i>	24	15.20
	<i>Combretum molle</i>	27	9.60
DBH < 20 cm	<i>Ozoroa insignis</i> subsp. <i>reticulata</i>	5	8.10
	<i>Acacia drepanolobium</i>	6	13.30
	<i>Sclerocarya birrea</i>	6	5.30
	<i>Bauhinia petersiana</i>	4	16.00

**Sampling point 32:**

Coordinates: S 7°03'52.9" / E 32°27'26.9"

Slope: 1-2%; slope exposure: 210°

Dominant tree height: 8 m

Basal area (Bitterlich, k=1): 0.5 m<sup>2</sup>

Photos: 7518, 7519, 7520 (only 3 photos)

Disturbances/notes (32-33): 1 *Manilkara mochisia* cut for harvesting wild honey (1 year) (220 steps)

Diameter class	Nearest species in the each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Sclerocarya birrea</i>	25	19.50
	No tree		
	No tree		
	<i>Sclerocarya birrea</i>	37	17.40
DBH < 20 cm	<i>Combretum zeyheri</i>	15	10.40
	<i>Combretum fragrans</i>	3	10.80
	<i>Combretum fragrans</i>	5	17.80
	<i>Albizia amara</i>	3	14.00

**Sampling point 33:**

Coordinates: S 7°03'45.1" / E 32°27'29.0"

Slope: 0-1%; slope exposure: 140°

Dominant tree height: 14 m

Basal area (Bitterlich, k=1): 1.5 m<sup>2</sup>

Photos: 7521, 7522, 7523, 7524

Disturbances/notes (33-34): 1 *Julbernardia globiflora* cut for harvesting wild honey harvesting (1 year) (80 steps); 1 *Pterocarpus angolensis* cut for timber (4 years) (120 steps)

Diameter class	Nearest species in the each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	No tree		
	<i>Pericopsis angolensis</i>	33	11.0
	No tree		
	No tree		
DBH < 20 cm	<i>Combretum molle</i>	3	3.80
	<i>Pterocarpus tinctorius</i>	3	4.80
	<i>Combretum molle</i>	5	6.90
	<i>Combretum collinum</i>	10	10.50

**Sampling point 34:**

Coordinates: S 7°03'37.3" / E 32°27'31.2"

Slope: 1-2%; slope exposure: 130°

Dominant tree height: 13 m

Basal area (Bitterlich, k=1): 6 m<sup>2</sup>

Photos: 7525, 7526, 7527, 7528

Disturbances/notes: -

Diameter class	Nearest species in the each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Terminalia sericea</i>	29	11.40
	No tree		

	<i>Brachystegia spiciformis</i>	29	6.80
	<i>Brachystegia stipulata</i>	20	5.20
DBH < 20 cm	<i>Ozoroa insignis</i> subsp. <i>reticulata</i>	3	3.90
	<i>Pterocarpus tinctorius</i>	5	4.60
	<i>Brachystegia stipulata</i>	8	1.85
	<i>Combretum zeyheri</i>	8	7.00

**Sampling point 35:**

Coordinates S 7°03'30.6" / E 32°27'34.9"

Slope: 0-1%; slope exposure: 180°

Dominant tree height: 13 m

Basal area (Bitterlich, k=1): 4 m<sup>2</sup>

Photos: 7529, 7530, 7531, 7532

Disturbances/notes: -

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Burkea africana</i>	25	16.50
	No tree		
	<i>Lonchocarpus capassa</i>	30	18.40
	<i>Terminalia sericea</i>	26	7.80
DBH < 20 cm	<i>Combretum molle</i>	14	2.70
	<i>Ozoroa insignis</i> subsp. <i>reticulata</i>	7	5.50
	<i>Dichrostachys cinerea</i>	6	3.25
	<i>Dichrostachys cinerea</i>	8	5.00

**Miombo vegetation (11-16, 22-25, 31-35):**

Mean basal area (Bitterlich, k=1): 4.60 m<sup>2</sup>

Dominant tree height: 12.1 m

**Savanna (mbuga) vegetation (sampling points 1-10, 17-21, 26-30):**

Mean basal area (Bitterlich, k=1): 2.20 m<sup>2</sup>

**Transect RT2:**

Starting point: give location; direction azimuth: 360°

**Sampling point 1:**

Coordinates: S 419153 / E 9224980

Slope: 1-2%; slope exposure: E

Dominant tree height: 14 m

Basal area (Bitterlich, k=1): 6 m<sup>2</sup>

Photos: -

Disturbances/notes: -

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Terminalia sericea</i>	21	12.8
	No tree		
	<i>Terminalia sericea</i>	25	2.4
	<i>Pseudolachnostylis maprouneifolia</i>	25	3.8
DBH < 20 cm	<i>Julbernardia globiflora</i>	4	6.1
	<i>Lanea schimperii</i>	15	4.1
	<i>Bauhinia petersiana</i>	4	4.8
	<i>Julbernardia globiflora</i>	4	3.1

**Sampling point 2:**

Coordinates: S 419121 / E 9225275

Slope: 2-3%; slope exposure: NE

Dominant tree height: 15 m

Basal area (Bitterlich, k=1): 6 m<sup>2</sup>

Photos: -

Disturbances/notes: -

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Julbernardia globiflora</i>	47	4.7
	<i>Lanea schimperii</i>	20	16.6
	<i>Julbernardia globiflora</i>	48	11.5
	<i>Pseudolachnostylis maprouneifolia</i>	30	12.3
DBH < 20 cm	<i>Combretum molle</i>	5	6.5
	<i>Pseudolachnostylis maprouneifolia</i>	7	9.7
	<i>Julbernardia globiflora</i>	7	5.2
	<i>Crossopteryx febrifuga</i>	8	14.3

**Sampling point 3:**

Coordinates: S 419096 / E 9225578

Slope: 2-3%; slope exposure: E

Dominant tree height: 5 m

Basal area (Bitterlich, k=1): 0 m<sup>2</sup>

Photos: -

Disturbances/notes: Mbuga vegetation

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	No tree		
	No tree		
	No tree		
	No tree		
DBH < 20 cm	<i>Combretum fragrans</i>	5	9.4
	<i>Combretum fragrans</i>	6	4.5
	<i>Combretum fragrans</i>	6	8.3
	<i>Combretum fragrans</i>	4	5.3

**Sampling point 4:**

Coordinates: S 419102 / E 9225881

Slope: 1-2%; slope exposure: S

Dominant tree height: 16 m

Basal area (Bitterlich, k=1): 7 m<sup>2</sup>

Photos: -

Disturbances/notes: -

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Pterocarpus tinctorius</i>	35	13.5
	<i>Julbernardia globiflora</i>	32	16.6
	<i>Terminalia mollis</i>	31	14.1
	<i>Pseudolachnostylis maprouneifolia</i>	24	12.4
DBH < 20 cm	<i>Brachystegia floribunda</i>	5	3.5
	<i>Brachystegia floribunda</i>	5	2
	<i>Terminalia sericea</i>	4	5.5
	<i>Crossopteryx febrifuga</i>	12	1.9

**Sampling point 5:**

Coordinates: S 419102 / E 9226178

Slope: 2-3%; slope exposure: S

Dominant tree height: 15 m

Basal area (Bitterlich, k=1): 16 m<sup>2</sup>

Photos: -

Disturbances/notes: -

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Brachystegia boehmii</i>	25	9.6
	<i>Julbernardia globiflora</i>	50	8.8
	<i>Oldfieldia dactylophylla</i>	22	9.0
	No tree		
DBH < 20 cm	<i>Brachystegia boehmii</i>	17	2.4
	<i>Brachystegia boehmii</i>	11	2.1
	<i>Julbernardia globiflora</i>	6	3.6
	<i>Brachystegia boehmii</i>	7	1.0

**Sampling point 6:**

Coordinates: S 419102 / E 9226476

Slope: 1-2%; slope exposure: N

Dominant tree height: 13 m

Basal area (Bitterlich, k=1): 11 m<sup>2</sup>

Photos: -

Disturbances/notes: -

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	No tree		
	<i>Julbernardia globiflora</i>	34	18.9
	<i>Brachystegia stipulata</i>	58	13.2
	<i>Brachystegia stipulata</i>	47	6.4
DBH < 20 cm	<i>Julbernardia globiflora</i>	5	2.9
	<i>Dichrostachys cinerata</i>	3	1.3
	<i>Julbernardia globiflora</i>	5	2.7
	<i>Diplorhynchus condylocarpon</i>	4	2.3

**Sampling point 7:**

Coordinates: S 419101 / E 9226774

Slope: 2-3%; slope exposure: E

Dominant tree height: 14 m

Basal area (Bitterlich, k=1): 10 m<sup>2</sup>

Photos: -

Disturbances/notes: -

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Pseudolachnostylis maprouneifolia</i>	23	13.2
	<i>Brachystegia floribunda</i>	31	10.0
	<i>Pterocarpus angolensis</i>	46	3.4
	<i>Burkea africana</i>	27	17.0
DBH < 20 cm	<i>Combretum molle</i>	7	6.1
	<i>Hymenocardia acida</i>	3	3.4
	<i>Burkea africana</i>	6	10.5
	<i>Pseudolachnostylis maprouneifolia</i>	11	4.7

**Sampling point 8:**

Coordinates: S 419101 / E 9227072

Slope: 1%; slope exposure: E

Dominant tree height: 14 m

Basal area (Bitterlich, k=1): 8 m<sup>2</sup>

Photos: -

Disturbances/notes: -

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Brachystegia boehmii</i>	47	11.1
	No tree		
	No tree		
	<i>Brachystegia floribunda</i>	74	13.2
DBH < 20 cm	<i>Pterocarpus angolensis</i>	5	4.4
	<i>Lannea schimperi</i>	3	2.9
	<i>Julbernardia globiflora</i>	14	3.1
	<i>Pseudolachnostylis maprouneifolia</i>	3	4.5

**Sampling point 9:**

Coordinates: S 4191100 / E 9227370

Slope: 2-3%; slope exposure: E

Dominant tree height: 16 m

Basal area (Bitterlich, k=1): 15 m<sup>2</sup>

Photos: -

Disturbances/notes: -

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Brachystegia spiciformis</i>	30	8.4
	<i>Brachystegia boehmii</i>	36	8.9
	<i>Brachystegia boehmii</i>	51	13.4
	<i>Brachystegia spiciformis</i>	33	3.1
DBH < 20 cm	<i>Ochna longipes</i>	7	8.9
	<i>Diplorhynchus condylocarpon</i>	3	2
	<i>Dichrostachys cinerea</i>	5	7.5
	<i>Pseudolachnostylis maprouneifolia</i>	14	6.7

**Sampling point 10:**

Coordinates: S 4191100 / E 9227668



Slope: 2-3%; slope exposure: E  
 Dominant tree height: 13 m  
 Basal area (Bitterlich, k=1): 6 m<sup>2</sup>  
 Photos: -  
 Disturbances/notes: -

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Brachystegia spiciformis</i>	36	1.3
	No tree		
	<i>Brachystegia spiciformis</i>	35	5.9
	No tree		
DBH < 20 cm	<i>Ozoroa insignis</i>	4	7.0
	<i>Flacourtia indica</i>	3	5.8
	<i>Flacourtia indica</i>	4	2.0
	<i>Brachystegia spiciformis</i>	5	7.4

**Sampling point 11:**

Coordinates: S 419100 / E 9227966  
 Slope: 5%; slope exposure: E  
 Dominant tree height: 12 m  
 Basal area (Bitterlich, k=1): 6 m<sup>2</sup>  
 Photos: -  
 Disturbances/notes: -

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Brachystegia spiciformis</i>	34	13.1
	<i>Pericopsis angolensis</i>	34	13.0
	<i>Julbernardia globiflora</i>	26	9.0
	No tree		
DBH < 20 cm	<i>Lansea schimperi</i>	5	5.2
	<i>Brachystegia spiciformis</i>	3	5.0
	<i>Brachystegia spiciformis</i>	7	6.5
	<i>Julbernardia globiflora</i>	8	6.1

**Sampling point 12:**

Coordinates: S 419099 / E 9228264  
 Slope: 2-3%; slope exposure: E  
 Dominant tree height: 11 m  
 Basal area (Bitterlich, k=1): 10 m<sup>2</sup>  
 Photos: -  
 Disturbances/notes: -

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Pseudolachnostylis maprouneifolia</i>	25	16.3
	<i>Pterocarpus angolensis</i>	30	16.0
	<i>Julbernardia globiflora</i>	34	18.5
	No tree		
DBH < 20 cm	<i>Pterocarpus angolensis</i>	4	2.3
	<i>Julbernardia globiflora</i>	7	2.0
	<i>Pseudolachnostylis maprouneifolia</i>	4	6.7
	<i>Cassipourea mollis</i>	5	2.2

**Sampling point 13:**

Coordinates: S 419096 / E 9228562  
 Slope: 2-3%; slope exposure: E

Dominant tree height: 9 m  
 Basal area (Bitterlich, k=1): 10 m<sup>2</sup>  
 Photos: -  
 Disturbances/notes: open vegetation, NOT CONSIDERED!

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	No tree		
	No tree		
	No tree		
	No tree		
DBH < 20 cm	<i>Julbernardia globiflora</i>	7	3.6
	<i>Julbernardia globiflora</i>	6	1.7
	<i>Pericopsis angolensis</i>	7	4.5
	<i>Julbernardia globiflora</i>	8	2.7

**Sampling point 14:**

Coordinates: S 419098 / E 9228860  
 Slope: 5%; slope exposure: E  
 Dominant tree height: 8 m  
 Basal area (Bitterlich, k=1): 11 m<sup>2</sup>  
 Photos: -  
 Disturbances/notes: -

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Pseudolachnostylis maprouneifolia</i>	22	16.9
	No tree		
	<i>Pseudolachnostylis maprouneifolia</i>	23	18.9
	No tree		
DBH < 20 cm	<i>Pterocarpus tinctorius</i>	9	3.1
	<i>Pterocarpus angolensis</i>	3	3.3
	<i>Brachystegia boehmii</i>	15	3.5
	<i>Julbernardia globiflora</i>	3	2.1

**Sampling point 15:**

Coordinates: S 419098 / E 9229158  
 Slope: 1%; slope exposure: N  
 Dominant tree height: 10 m  
 Basal area (Bitterlich, k=1): 4 m<sup>2</sup>  
 Photos: -  
 Disturbances/notes: -

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	No tree		
	<i>Sclerocalya birea</i>	33	2.0
	<i>Combretum fragrans</i>	20	2.0
	No tree		
DBH < 20 cm	<i>Pterocarpus tinctorius</i>	5	5.3
	<i>Combretum fragrans</i>	3	8.0
	<i>Combretum fragrans</i>	10	3.7
	<i>Pterocarpus tinctorius</i>	9	4.8

**Sampling point 16:**

Coordinates: S 419097 / E 9229456  
 Slope: 1%; slope exposure: S

Dominant tree height: 11 m  
 Basal area (Bitterlich, k=1): 2 m<sup>2</sup>  
 Photos: -  
 Disturbances/notes: Mbuga vegetation

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	No tree		
	No tree		
	No tree		
	No tree		
DBH < 20 cm	<i>Combretum fragrans</i>	10	4.6
	<i>Combretum fragrans</i>	6	9.9
	<i>Combretum fragrans</i>	9	3.0
	<i>Combretum fragrans</i>	13	7.2

**Sampling point 17:**

Coordinates: S 419097 / E 9229456  
 Slope: 1%; slope exposure: N  
 Dominant tree height: 10 m  
 Basal area (Bitterlich, k=1): 3 m<sup>2</sup>  
 Photos: -  
 Disturbances/notes: Mbuga vegetation

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	No tree		
	No tree		
	No tree		
	<i>Brachystegia floribunda</i>	26	6.0
DBH < 20 cm	<i>Terminalia mollis</i>	7	5.7
	<i>Combretum fragrans</i>	6	3.5
	<i>Terminalia mollis</i>	12	6.0
	<i>Brachystegia floribunda</i>	10	1.2

**Sampling point 18:**

Coordinates: S 419096 / E 9230051  
 Slope: 1-2%; slope exposure: E  
 Dominant tree height: 7 m  
 Basal area (Bitterlich, k=1): 1 m<sup>2</sup>  
 Photos: -  
 Disturbances/notes: Mbuga vegetation

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Brachystegia floribunda</i>	25	9.9
	No tree		
	No tree		
	No tree		
DBH < 20 cm	<i>Combretum fragrans</i>	7	2.7
	<i>Combretum fragrans</i>	7	3.4
	<i>Bauhinia petersiana</i>	3	9.0
	<i>Combretum fragrans</i>	8	2.8

**Sampling point 19:**

Coordinates: S 49096 / E 9230349  
 Slope: 1%; slope exposure: E

Dominant tree height: 5 m  
 Basal area (Bitterlich, k=1): 0 m<sup>2</sup>  
 Photos: -  
 Disturbances/notes: Mbuga vegetation

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	No tree		
	No tree		
	No tree		
	No tree		
DBH < 20 cm	<i>Combretum fragrans</i>	9	13.2
	<i>Bauhinia petersiana</i>	5	10.4
	<i>Combretum fragrans</i>	11	10.4
	<i>Combretum fragrans</i>	12	9.0

**Sampling point 20:**

Coordinates: S 419095 / E 9230647  
 Slope: 1%; slope exposure: E  
 Dominant tree height: 5 m  
 Basal area (Bitterlich, k=1): 1 m<sup>2</sup>  
 Photos: -  
 Disturbances/notes: Mbuga vegetation

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	No tree		
	No tree		
	No tree		
	No tree		
DBH < 20 cm	<i>Combretum fragrans</i>	9	10.0
	<i>Bauhinia petersiana</i>	8	5.2
	<i>Combretum fragrans</i>	12	3.0
	<i>Combretum fragrans</i>	5	2.8

**Sampling point 21:**

Coordinates: S 419095 / E 9230945  
 Slope: 1%; slope exposure: E  
 Dominant tree height: 5 m  
 Basal area (Bitterlich, k=1): 0 m<sup>2</sup>  
 Photos: -  
 Disturbances/notes: Mbuga vegetation

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	No tree		
	No tree		
	No tree		
	No tree		
DBH < 20 cm	<i>Combretum fragrans</i>	5	8.1
	<i>Acacia drepanolobium</i>	3	3.0
	<i>Combretum fragrans</i>	5	3.5
	<i>Combretum fragrans</i>	7	7.5

**Sampling point 22:**

Coordinates: S 419095 / E 9231243  
 Slope: 1%; slope exposure: E  
 Dominant tree height: 5 m  
 Basal area (Bitterlich, k=1): 3 m<sup>2</sup>

Photos: -

Disturbances/notes: Mbuga vegetation

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	No tree		
	No tree		
	No tree		
	No tree		
DBH < 20 cm	<i>Combretum fragrans</i>	6	1.0
	<i>Terminalia mollis</i>	9	8.7
	<i>Terminalia mollis</i>	6	5.2
	<i>Combretum fragrans</i>	14	5.9

### Sampling point 23:

Coordinates: S 419094 / E 9231541

Slope: 2-3%; slope exposure: W

Dominant tree height: 13 m

Basal area (Bitterlich, k=1): 2 m<sup>2</sup>

Photos: -

Disturbances/notes: -

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	No tree		
	No tree		
	<i>Pericopsis angolensis</i>	42	10.0
	<i>Terminalia mollis</i>	20	4.2
DBH < 20 cm	<i>Terminalia mollis</i>	19	10.7
	<i>Brachystegia boehmii</i>	4	7.1
	<i>Terminalia sericea</i>	8	2.4
	<i>Ozoroa insignis subsp. reticulata</i>	12	7.3

### Sampling point 24:

Coordinates: S 419094 / E 9231839

Slope: 1%; slope exposure: W

Dominant tree height: 16 m

Basal area (Bitterlich, k=1): 4 m<sup>2</sup>

Photos: -

Disturbances/notes: -

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	No tree		
	<i>Brachystegia boehmii</i>	27	14.0
	<i>Pericopsis angolensis</i>	36	14.2
	<i>Crossopteryx febrifuga</i>	21	12.3
DBH < 20 cm	<i>Lannea schimperii</i>	4	2.7
	<i>Hymenocardia acida</i>	3	3.2
	<i>Schrebera trichoclada</i>	11	4.4
	<i>Ozoroa insignis subsp. reticulata</i>	7	3.3

### Sampling point 25:

Coordinates: S 419093 / E 9232137

Slope: 1-2%; slope exposure: E

Dominant tree height: 17 m

Basal area (Bitterlich, k=1): 5 m<sup>2</sup>

Photos: -

Disturbances/notes: -

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Pseudolachnostylis maprouneifolia</i>	27	1.7
	<i>Pericopsis angolensis</i>	45	14.8
	<i>Pseudolachnostylis maprouneifolia</i>	27	2.0
	<i>Pterocarpus tinctorius</i>	28	17.9
DBH < 20 cm	<i>Combretum zeyheri</i>	7	3.7
	<i>Pseudolachnostylis maprouneifolia</i>	7	6.0
	<i>Pterocarpus angolensis</i>	4	4.0
	<i>Lannea schimperi</i>	5	4.5

**Sampling point 26:**

Coordinates: S 419093 / E 9232435

Slope: 1-2%; slope exposure: W

Dominant tree height: 13 m

Basal area (Bitterlich, k=1): 4 m<sup>2</sup>

Photos: -

Disturbances/notes: -

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Brachystegia floribunda</i>	25	15.7
	<i>Brachystegia stipulata</i>	44	7.6
	<i>Pterocarpus angolensis</i>	25	1.8
	<i>Pseudolachnostylis maprouneifolia</i>	21	13.5
DBH < 20 cm	<i>Pseudolachnostylis maprouneifolia</i>	17	6.9
	<i>Terminalia mollis</i>	7	5.3
	<i>Crossopteryx febrifuga</i>	8	5.4
	<i>Diplorhynchus condylocarpon</i>	5	1.1

**Sampling point 27:**

Coordinates: S 419092 / E 9232733

Slope: 2-3%; slope exposure: SE

Dominant tree height: 14 m

Basal area (Bitterlich, k=1): 4 m<sup>2</sup>

Photos: -

Disturbances/notes: -

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Terminalia sericea</i>	34	2.7
	No tree		
	<i>Terminalia sericea</i>	30	13.2
	<i>Lannea schimperi</i>	31	15.5
DBH < 20 cm	<i>Combretum molle</i>	10	6.3
	<i>Kigelia africana</i>	3	2.9
	<i>Diplorhynchus condylocarpon</i>	16	4.8
	<i>Schrebera trichoclada</i>	8	5.2

**Sampling point 28:**

Coordinates: S 419092 / E 9233031

Slope: 2-3%; slope exposure: S

Dominant tree height: 16 m

Basal area (Bitterlich, k=1): 4 m<sup>2</sup>

Photos: -

Disturbances/notes: -

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
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DBH ≥ 20 cm	<i>Julbernardia globiflora</i>	33	11.2
	No tree		
	No tree		
	No tree		
DBH < 20 cm	<i>Diplorhynchus condylocarpon</i>	8	3.4
	<i>Pterocarpus angolensis</i>	4	4
	<i>Diplorhynchus condylocarpon</i>	4	1.4
	<i>Brachystegia stipulata</i>	11	6.5

**Sampling point 29:**

Coordinates: S 419091 / E 9233329

Slope: 2-3%; slope exposure: S

Dominant tree height: 15 m

Basal area (Bitterlich, k=1): 8 m<sup>2</sup>

Photos: -

Disturbances/notes: -

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Julbernardia globiflora</i>	39	19.7
	<i>Oldfieldia dactylophylla</i>	21	13.7
	<i>Julbernardia globiflora</i>	28	16.6
	<i>Julbernardia globiflora</i>	32	13.1
DBH < 20 cm	<i>Brachystegia spiciformis</i>	4	3.9
	<i>Julbernardia globiflora</i>	8	4.0
	<i>Pterocarpus angolensis</i>	4	3.3
	<i>Julbernardia globiflora</i>	4	3.4

**Sampling point 30:**

Coordinates: S 419091 / E 9233627

Slope: 2-3%; slope exposure: N

Dominant tree height: 12 m

Basal area (Bitterlich, k=1): 5 m<sup>2</sup>

Photos: -

Disturbances/notes: -

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Brachystegia boehmii</i>	33	17.0
	<i>Pseudolachnostylis maprouneifolia</i>	21	9.6
	<i>Brachystegia boehmii</i>	25	10.0
	<i>Julbernardia globiflora</i>	22	11.0
DBH < 20 cm	<i>Julbernardia globiflora</i>	5	5.3
	<i>Crossopteryx febrifuga</i>	5	1.6
	<i>Hymenocardia acida</i>	5	3.3
	<i>Annona senegalensis</i>	3	4.7

**Miombo vegetation (1-2, 4-12, 14-15, 23-30):**

**Mean basal area (Bitterlich, k=1): 7.24 m<sup>2</sup>**

**Dominant tree height: 13.7 m**

**Savanna (mbuga) vegetation (sampling points 3, 16-22):**

**Mean basal area (Bitterlich, k=1): 1.25 m<sup>2</sup>**

### **Transect RT3:**

Starting point: give location; direction azimuth: 180°

#### **Sampling point 1:**

Coordinates: S 466231 / E 9233806

Slope: 5%; slope exposure: S

Dominant tree height: 17 m

Basal area (Bitterlich, k=1): 7 m<sup>2</sup>

Photos: -

Disturbances/notes: -

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Burkea africana</i>	31	15.4
	<i>Julbernardia globiflora</i>	47	16.2
	<i>Brachystegia bussei</i>	53	10.1
	<i>Brachystegia bussei</i>	40	5.5
DBH < 20 cm	<i>Diplorhynchus condylocarpon</i>	4	12.4
	<i>Pseudolachnostylis maprouneifolia</i>	5	1.5
	<i>Dichrostachys cinerea</i>	4	4.3
	<i>Diplorhynchus condylocarpon</i>	16	6.5

#### **Sampling point 2:**

Coordinates: S 466232 / E 9233508

Slope: 5%; slope exposure: S

Dominant tree height: 16 m

Basal area (Bitterlich, k=1): 4 m<sup>2</sup>

Photos: -

Disturbances/notes: -

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	No tree		
	<i>Julbernardia globiflora</i>	52	17.0
	<i>Julbernardia globiflora</i>	54	4.9
	<i>Combretum collinum</i>	31	9.4
DBH < 20 cm	<i>Brachystegia spiciformis</i>	10	10.5
	<i>Mlungwanyama</i>	9	2.9
	No tree		
	<i>Mtandara</i>	5	5.0

#### **Sampling point 3:**

Coordinates: S 466232 / E 9233210

Slope: 2-3%; slope exposure: S

Dominant tree height: 16 m

Basal area (Bitterlich, k=1): 4 m<sup>2</sup>

Photos: -

Disturbances/notes: 1 *Pterocarpus angolensis* cut (92 steps)

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	No tree		
	<i>Julbernardia globiflora</i>	45	9.7
	<i>Julbernardia globiflora</i>	52	16.3
	<i>Pseudolachnostylis maprouneifolia</i>	38	17.6
DBH < 20 cm	<i>Brachystegia boehmii</i>	3	1.8
	<i>Brachystegia floribunda</i>	14	4.2
	<i>Pterocarpus angolensis</i>	4	4.3
	<i>Diplorhynchus condylocarpon</i>	19	3.7



**Sampling point 4:**

Coordinates: S 466231 / E 9232912

Slope: 4.5%; slope exposure: SW

Dominant tree height: 14 m

Basal area (Bitterlich, k=1): 7 m<sup>2</sup>

Photos: -

Disturbances/notes: -

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Julbernardia globiflora</i>	27	14.5
	No tree		
	<i>Brachystegia boehmii</i>	48	14.7
	<i>Pseudolachnostylis maprouneifolia</i>	30	5.6
DBH < 20 cm	<i>Brachystegia floribunda</i>	3	2.4
	<i>Hymenocardia acida</i>	10	4.9
	<i>Brachystegia floribunda</i>	7	4.2
	<i>Brachystegia floribunda</i>	17	4.9

**Sampling point 5:**

Coordinates: S 466231 / E 9232614

Slope: 5%; slope exposure: SW

Dominant tree height: 15 m

Basal area (Bitterlich, k=1): 12 m<sup>2</sup>

Photos: -

Disturbances/notes: -

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Brachystegia floribunda</i>	34	8.0
	<i>Brachystegia floribunda</i>	33	1.0
	No tree		
	<i>Burkea africana</i>	27	10.9
DBH < 20 cm	<i>Burkea africana</i>	8	2.7
	<i>Brachystegia floribunda</i>	7	3.2
	<i>Terminalia sericea</i>	9	2.0
	<i>Brachystegia floribunda</i>	8	8.0

**Sampling point 6:**

Coordinates: S 466231 / E 9232317

Slope: 2-3%; slope exposure: SW

Dominant tree height: 16 m

Basal area (Bitterlich, k=1): 8 m<sup>2</sup>

Photos: -

Disturbances/notes: Beecamp (132 steps)

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Pseudolachnostylis maprouneifolia</i>	25	15.2
	<i>Kigelia africana</i>	32	9.4
	<i>Julbernardia globiflora</i>	34	16.3
	<i>Brachystegia floribunda</i>	47	4.1
DBH < 20 cm	<i>Burkea africana</i>	10	1.0
	<i>Hymenocardia acida</i>	4	5.0
	<i>Burkea africana</i>	4	1.9
	<i>Burkea africana</i>	5	4.2

**Sampling point 7:**

Coordinates: S 466231 / E 9232019

Slope: 2-3%; slope exposure: S  
 Dominant tree height: 18 m  
 Basal area (Bitterlich, k=1): 5 m<sup>2</sup>  
 Photos: -  
 Disturbances/notes: Beehives barked

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	No tree		
	<i>Julbernardia globiflora</i>	34	13.7
	<i>Diospyros mespiliformis</i>	52	9.9
	<i>Pterocarpus tinctorius</i>	27	12.3
DBH < 20 cm	<i>Brachystegia spiciformis</i>	3	4.3
	<i>Brachystegia spiciformis</i>	7	6.1
	<i>Commiphora mosambicensis</i>	5	1.0
	<i>Kama mkoma (Grewia sp.?)</i>	4	4.3

**Sampling point 8:**

Coordinates: S 466231 / E 9231721  
 Slope: 1-2%; slope exposure: SW  
 Dominant tree height: 16 m  
 Basal area (Bitterlich, k=1): 8 m<sup>2</sup>  
 Photos: -  
 Disturbances/notes: -

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Pseudolachnostylis maprouneifolia</i>	23	3.0
	<i>Terminalia sericea</i>	24	15.6
	No tree		
	<i>Terminalia sericea</i>	26	13.5
DBH < 20 cm	<i>Diplorhynchus condylocarpon</i>	3	6.4
	<i>Brachystegia floribunda</i>	3	5.4
	<i>Brachystegia floribunda</i>	13	6.3
	<i>Brachystegia floribunda</i>	4	3.5

**Sampling point 9:**

Coordinates: S 466231 / E 9231423  
 Slope: 3-4%; slope exposure: SW  
 Dominant tree height: 16 m  
 Basal area (Bitterlich, k=1): 5 m<sup>2</sup>  
 Photos: -  
 Disturbances/notes: -

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Brachystegia stipulata</i>	41	13.3
	No tree		
	No tree		
	No tree		
DBH < 20 cm	<i>Brachystegia stipulata</i>	4	1.8
	<i>Diplorhynchus condylocarpon</i>	5	4.0
	<i>Brachystegia stipulata</i>	3	9.4
	<i>Julbernardia globiflora</i>	4	6

**Sampling point 10:**

Coordinates: S 466231 / E 9231125  
 Slope: 1-2%; slope exposure: W  
 Dominant tree height: 13 m  
 Basal area (Bitterlich, k=1): 5 m<sup>2</sup>

Photos: -  
Disturbances/notes: -

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Pseudolachnostylis maprouneifolia</i>	22	13.3
	<i>Brachystegia boehmii</i>	35	6.3
	<i>Brachystegia boehmii</i>	63	13.8
	<i>Diospyros cornii</i>	27	3.9
DBH < 20 cm	<i>Combretum fragrans</i>	5	4.0
	<i>Diplorhynchus condylocarpon</i>	3	6.3
	<i>Dalbergia nitidula</i> (boehmii?)	3	8.1
	<i>Diplorhynchus condylocarpon</i>	6	3.1

### Sampling point 11:

Coordinates: S 466231 / E 9230827  
Slope: 1-2%; slope exposure: SW  
Dominant tree height: 10 m  
Basal area (Bitterlich, k=1): 4 m<sup>2</sup>  
Photos: -  
Disturbances/notes: -

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	No tree		
	<i>Pseudolachnostylis maprouneifolia</i>	21	16.2
	No tree		
	No tree		
DBH < 20 cm	<i>Albizia versicolor</i> ( <i>A. antunesiana</i> ?)	6	1.8
	<i>Diplorhynchus condylocarpon</i>	7	3.0
	<i>Brachystegia boehmii</i>	5	3.9
	<i>Julbernardia globiflora</i>	3	3.6

### Sampling point 12:

Coordinates: S 466231 / E 9230529  
Slope: 1-3%; slope exposure: S  
Dominant tree height: 14 m  
Basal area (Bitterlich, k=1): 4 m<sup>2</sup>  
Photos: -  
Disturbances/notes: -

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	No tree		
	No tree		
	<i>Julbernardia globiflora</i>	34	11.2
	No tree		
DBH < 20 cm	<i>Julbernardia globiflora</i>	4	7
	<i>Brachystegia stipulata</i>	4	2.2
	<i>Brachystegia stipulata</i>	4	1.1
	<i>Brachystegia stipulata</i>	3	1.3

### Sampling point 13:

Coordinates: S 466231 / E 9230231  
Slope: 5%; slope exposure: S  
Dominant tree height: 15 m  
Basal area (Bitterlich, k=1): 7 m<sup>2</sup>  
Photos: -  
Disturbances/notes: -

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Terminalia mollis</i>	69	14.9
	No tree		
	No tree		
	<i>Brachystegia boehmii</i>	50	17.4
DBH < 20 cm	<i>Brachystegia stipulata</i>	7	4.0
	<i>Hymenocardia acida</i>	4	2.3
	<i>Crossopteryx febrifuga</i>	6	9.0
	<i>Pseudolachnostylis maprouneifolia</i>	4	1.0

**Sampling point 14:**

Coordinates: S 466232 / E 9229933

Slope: 1%; slope exposure: S

Dominant tree height: 8 m

Basal area (Bitterlich, k=1): 1 m<sup>2</sup>

Photos: -

Disturbances/notes: Open vegetation, NOT CONSIDERED FOR TRANSECT RT3!

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	No tree		
	No tree		
	No tree		
	No tree		
DBH < 20 cm	<i>Acacia drepanolobium</i>	8	13.1
	<i>Combretum fragrans</i>	4	9.4
	<i>Combretum molle</i>	12	6.1
	<i>Combretum fragrans</i>	9	8.9

**Sampling point 15:**

Coordinates: S 466232 / E 9229636

Slope: 1%; slope exposure: W

Dominant tree height: 10 m

Basal area (Bitterlich, k=1): 0 m<sup>2</sup>

Photos: -

Disturbances/notes: Open vegetation, NOT CONSIDERED FOR TRANSECT RT3!

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	No tree		
	No tree		
	No tree		
	No tree		
DBH < 20 cm	<i>Bauhinia petersiana</i>	3	3.5
	<i>Combretum fragrans</i>	5	8.6
	<i>Combretum fragrans</i>	15	8.9
	<i>Bauhinia thoningii</i>	5	9.4

**Sampling point 16:**

Coordinates: S 466234 / E 9229340

Slope: 1-2%; slope exposure: SW

Dominant tree height: 14 m

Basal area (Bitterlich, k=1): 4 m<sup>2</sup>

Photos: -

Disturbances/notes: -

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
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DBH ≥ 20 cm	No tree		
	No tree		
	<i>Kigelia africana</i>	22	7.5
	<i>Parinari curatellifolia</i>	64	1.2
DBH < 20 cm	<i>Brachystegia longifolia</i>	4	2.4
	<i>Brachystegia boehmii</i>	17	4.0
	<i>Vitex doniana</i>	3	4.1
	<i>Oldfieldia dactylophylla</i>	6	7.4

#### Sampling point 17:

Coordinates: S 466232 / E 9229040

Slope: 2-3%; slope exposure: SW

Dominant tree height: 8 m

Basal area (Bitterlich, k=1): 7 m<sup>2</sup>

Photos: -

Disturbances/notes: -

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Pterocarpus angolensis</i>	33	16.0
	<i>Pseudolachnostylis maprouneifolia</i>	25	13.3
	<i>Burkea africana</i>	26	3.2
	<i>Pseudolachnostylis maprouneifolia</i>	20	15.2
DBH < 20 cm	<i>Combretum collinum</i>	5	3.4
	<i>Oldfieldia dactylophylla</i>	13	3.5
	<i>Oldfieldia dactylophylla</i>	4	2.8
	<i>Brachystegia floribunda</i>	8	2.5

#### Sampling point 18:

Coordinates: S 466232 / E 9228742

Slope: 1-2%; slope exposure: NW

Dominant tree height: 13 m

Basal area (Bitterlich, k=1): 6 m<sup>2</sup>

Photos: -

Disturbances/notes: -

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Terminalia mollis</i>	22	18.4
	No tree		
	No tree		
	No tree		
DBH < 20 cm	<i>Pseudolachnostylis maprouneifolia</i>	10	5.4
	<i>Pseudolachnostylis maprouneifolia</i>	17	3.7
	<i>Ozoroa insignis</i> subsp. <i>reticulata</i>	3	5.0
	<i>Dichrostachys cinerea</i>	5	3.3

#### Sampling point 19:

Coordinates: S 466233 / E 9228444

Slope: 1%; slope exposure: S

Dominant tree height: 12 m

Basal area (Bitterlich, k=1): 7 m<sup>2</sup>

Photos: -

Disturbances/notes: -

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Julbernardia globiflora</i>	31	5.1
	<i>Julbernardia globiflora</i>	39	6.8

	No tree		
	No tree		
DBH < 20 cm	<i>Diplorhynchus condylocarpon</i>	3	3.5
	<i>Strychnos spinosa</i>	6	10.5
	<i>Pseudolachnostylis maprouneifolia</i>	7	12.3
	<i>Brachystegia boehmii</i>	5	10.5

**Sampling point 20:**

Coordinates: S 466233 / E 9228146

Slope: 1-2%; slope exposure: SW

Dominant tree height: 8 m

Basal area (Bitterlich, k=1): 9 m<sup>2</sup>

Photos: -

Disturbances/notes: -

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Pseudolachnostylis maprouneifolia</i>	22	9.4
	No tree		
	No tree		
	No tree		
DBH < 20 cm	<i>Julbernardia globiflora</i>	7	2.4
	<i>Julbernardia globiflora</i>	4	6.0
	<i>Brachystegia stipulata</i>	4	2.9
	<i>Julbernardia globiflora</i>	7	1.9

**Sampling point 21:**

Coordinates: S 466233 / E 9227550

Slope: 2-3%; slope exposure: SW

Dominant tree height: 13 m

Basal area (Bitterlich, k=1): 6 m<sup>2</sup>

Photos: -

Disturbances/notes: -

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	No tree		
	No tree		
	<i>Pseudolachnostylis maprouneifolia</i>	21	7.8
	No tree		
DBH < 20 cm	<i>Combretum fragrans</i>	16	3.8
	<i>Diplorhynchus condylocarpon</i>	4	6.2
	<i>Brachystegia boehmii</i>	3	7.2
	<i>Terminalia mollis</i>	7	11.4

**Sampling point 22:**

Coordinates: S 466233 / E 9227550; near river Boko

Slope: 2-3%; slope exposure: W

Dominant tree height: 12 m

Basal area (Bitterlich, k=1): 4 m<sup>2</sup>

Photos: -

Disturbances/notes: Open vegetation, NOT CONSIDERED FOR TRANSECT RT3!

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	No tree		
	No tree		
	No tree		
	<i>Combretum fragrans</i>	32	7.2

DBH < 20 cm	<i>Combretum zeyheri</i>	4	7.0
	<i>Combretum fragrans</i>	7	8.2
	<i>Terminalia mollis</i>	11	11.2
	<i>Combretum fragrans</i>	6	7.2

**Sampling point 23:**

Coordinates: S 466233 / E 9227252; near river Boko

Slope: 10%; slope exposure: W

Dominant tree height: 14 m

Basal area (Bitterlich, k=1): 9 m<sup>2</sup>

Photos: -

Disturbances/notes:

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Burkea africana</i>	27	9.7
	<i>Brachystegia boehmii</i>	45	7.8
	<i>Julbernardia globiflora</i>	33	17.3
	No tree		
DBH < 20 cm	<i>Julbernardia globiflora</i>	4	9.4
	<i>Lannea schimperii</i>	8	7.9
	<i>Crossopteryx febrifuga</i>	6	9.5
	<i>Dalbergia nitidula (boehmii?)</i>	5	7.6

**Sampling point 24:**

Coordinates: S 466234 / E 9226954; near river Boko

Slope: 3-4%; slope exposure: W

Dominant tree height: 15 m

Basal area (Bitterlich, k=1): 5 m<sup>2</sup>

Photos: -

Disturbances/notes: Open vegetation, NOT CONSIDERED FOR TRANSECT RT3!

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Pseudolachnostylis maprouneifolia</i>	27	18.2
	No tree		
	No tree		
	<i>Brachystegia boehmii</i>	40	13.8
DBH < 20 cm	<i>Julbernardia globiflora</i>	3	3.9
	<i>Combretum fragrans</i>	5	9.1
	<i>Combretum fragrans</i>	3	8.0
	<i>Terminalia mollis</i>	18	5.1

**Miombo vegetation:**

Mean basal area (Bitterlich, k=1): 6.4 m<sup>2</sup>

Dominant tree height: 13.9 m

Savanna (mbuga) vegetation (sampling points 14, 15, 22, 24)

## Appendix C: Tree and shrub checklist for Mlele and Sikonge districts (28/11/2021)

Scientific name	Kikonongo / Kinyamwezi	Uses, ecology, other characteristics
<i>Acacia drepanolobium</i>		
<i>Acacia gerrardii</i>	Ulula	
<i>Acacia polyacantha</i>	Muwombwe	
<i>Acacia stuhlmannii</i>	Nunga?	
<i>Acacia tanganyikensis</i>	Mzima?	
<i>Azania quanzensis</i>	Mkola	Timber
<i>Albizia amara</i>	Mpogolo	
<i>Albizia antunesiana</i>	Mpilipili	Timber
<i>Albizia glaberrima</i>		
<i>Albizia grandibracteata</i>		
<i>Albizia gummifera</i>		
<i>Albizia harveyi</i>		
<i>Albizia versicolor</i>	Masako	
<i>Anisophyllea pomifera</i>	Msindwi	
<i>Annona senegalensis</i>	Mfilafila	Fruit edible
<i>Antidesma membranaceum</i>	Msekela	Fruit edible
<i>Antidesma venosum</i>	Msekela	Fruit edible
<i>Azanza garckeana</i>	Mtowo	
<i>Bauhinia petersiana</i>	Mfundwa mbogo	
<i>Bauhinia thonningii</i>	Mfundwa mbogo	
<i>Bobgunnia madagascariensis</i>	Kasanda	Timber
<i>Borassus aethiopum</i>	Sandala	Fruit edible
<i>Brachystegia boehmii</i>		
<i>Brachystegia bussei</i>	Mkongolo	Tall tree on rocky hillsides; slashed bark reddish
<i>Brachystegia floribunda?</i>	Msilanga	slashed bark reddish
<i>Brachystegia glaucescens</i>	Myombo	slashed bark reddish
<i>Brachystegia microphylla</i>	Mkongolo	slashed bark reddish
<i>Brachystegia spiciformis</i>	Mtundu / Umtundu	Timber; slashed bark reddish
<i>Brachystegia stipulata</i>		slashed bark reddish
<i>Brachystegia utilis/floribunda/manga?</i>	Msilanga	slashed bark reddish
<i>Brachystegia taxifolia</i>	Kapepe	slashed bark reddish
<i>Bridelia duvigneaudii</i>		
<i>Bridelia scleroneura</i>		



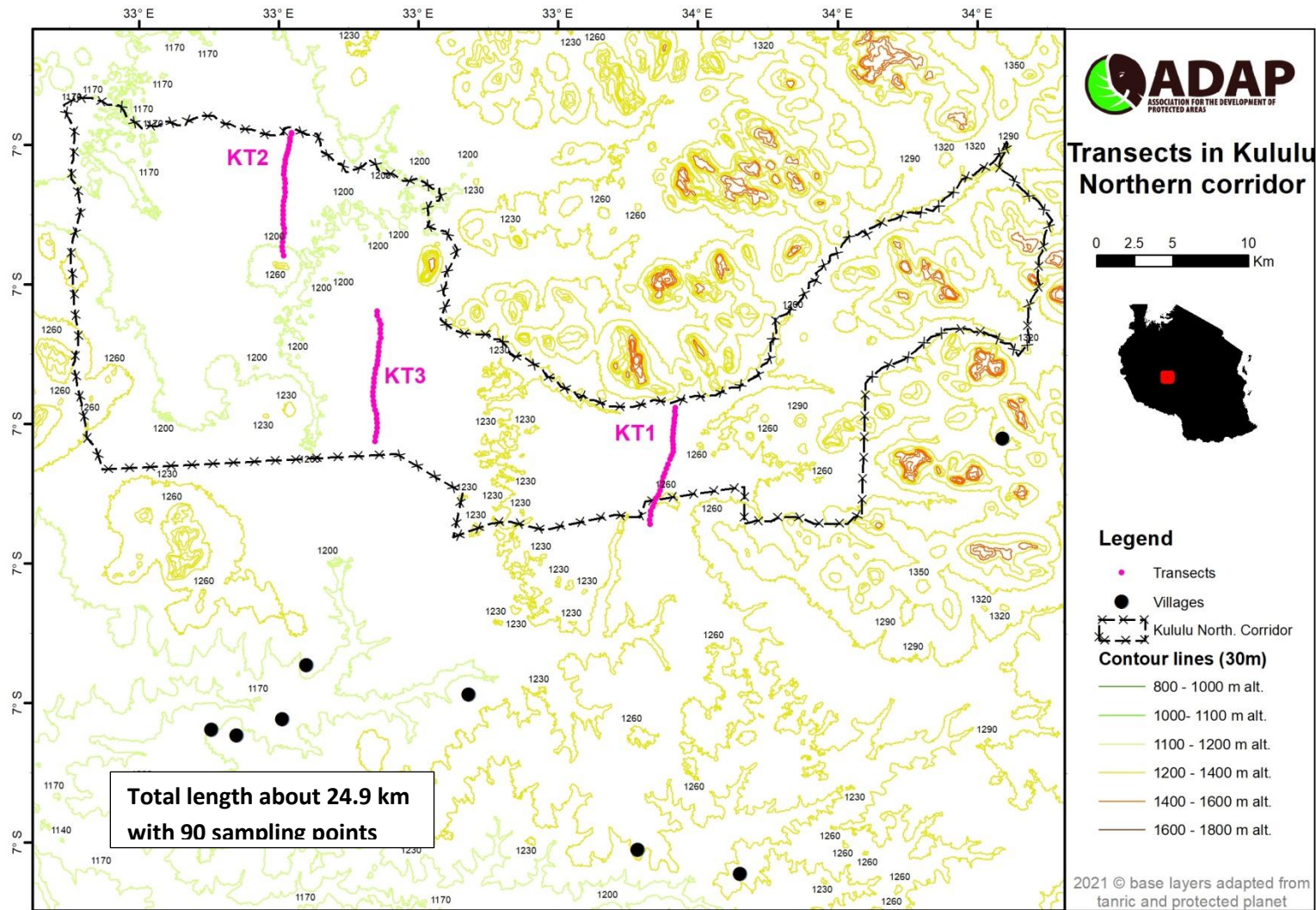
<i>Burkea africana</i>	Mgandosinsi	
<i>Cassia abbreviata</i>	Mlundalunda	
<i>Cassia singueana</i>	Mzokazoka	
<i>Cassipourea mollis</i>	Mlugala	
<i>Catunaregam spinosa</i>	Mpongole	
<i>Chrysophyllum bangweolense</i>		
<i>Combretum collinum</i>	Mlandala	
<i>Combretum fragrans (C. adenogonium)</i>	Mlozyaminze / Mluziaminzi	Leaf underside veloutinous
<i>Combretum molle</i>	Mlama	
<i>Combretum zeyheri</i>	Msana	Shiny leaf surface
<i>Commiphora africana</i>	Mponda	
<i>Commiphora mollis</i>	Kama mponda	
<i>Commiphora mosambicensis</i>		
<i>Crossopteryx febrifuga</i>	Msanza	
<i>Dalbergia boehmii</i>	Kapondolampassa	
<i>Dalbergia melanoxylon</i>	Mgembe (Swahili Mpingo)	Ebony, carving
<i>Dalbergia nitidula</i>	Kapondalampassa, Mzoka?	
<i>Dichrostachys cinerea</i>	Kasunzulu	
<i>Diospyros cornii</i>	Mnumbulu	
<i>Diospyros mespiliformis</i>	Msinde	Riverine forest; fruit edible
<i>Diplorhynchus condylocarpon</i>	Msonga	
<i>Dombeya rotundifolia</i>	Mlalila	
<i>Ekebergia capensis</i>	Mtuzya	
<i>Elaeodendron schweinfurthianum</i>		
<i>Entada abyssinica</i>	Mfutwamvula / Kamchicha / Kama mgunga	
<i>Eriosema sp.</i>		
<i>Erythrina abyssinica</i>	Kamchicha	
<i>Erythrophleum africanum</i>	Mgandongoye	
<i>Euclea schimperi?</i>	Mdaa / Msubata	
<i>Euphorbia candellabrum</i>	Mlangale	Drier areas
<i>Euphorbia matabelensis</i>	Kiponda	
<i>Flacourtia indica</i>	Msungu, Msingira	Fruit edible
<i>Flueggea virosa</i>		Fruit edible
<i>Friesodielsia obovata</i>	Msalansi	Fruit edible
<i>Garcinia huillensis</i>	Myeye	Fruit edible
<i>Grewia bicolor</i>	Mkoma	Fruit edible
<i>Grewia sp. ?</i>	Kama mkoma	

Hexalobus monopetalus	Mkuwa	Fruit edible
Hymenocardia acida	Kapala, Msanza	
Isoberlinia angolensis	Mnembela	
Isoberlinia tomentosa		
Julbernardia globiflora	Muva	Bark for bee hives; slashed bark yellowish
Kigelia africana	Mdungwa	
Lannea schimperi	Mgumbu, Mgugumbuga?	Fruit edible
Lannea discolor		Fruit edible
Lonchocarpus capassa (Philenoptera violacea)	Mvalevale	
Lonchocarpus eriocalyx		
Manilkara mochisia	Mkonze	Riverine forest; fruit edible
Maprounea africana		Fruit edible
Maranthes floribunda	Mwasha	
Markhamia obtusifolia	Mpapa	
Maytenus senegalensis	Mwesia	
Memecylon flavovirens	Mseweye	Fruit edible
Monanthotaxis discolor	Mshenene	
Monotes africanus	Mkokote	
Monotes katangensis	Mukokoti	
Multidentia crassa	Mukukumba	Fruit edible
Mundulea sericea		
Mystroxyton aethiopicum	Kasela	
Ochna afzelii ssp. afzelii		
Ochna holstii		
Ochna inermis		
Ochna longipes	Mumwaga, Mnyege	
Ochna oxyphylla		
Olax obtusifolia	Mtundwa	
Oldfieldia dactylophylla	Mliwamfwengi	Fruit edible
Ozoroa insignis subsp. reticulata	Mkalakala (Swahili: Mwembepoli)	
Parinari curatellifolia	Mbula/Mhula	Fruit edible
Pavetta stuhlmannii		
Pericopsis angolensis	Mbanga	Timber
Phyllanthus engleri	Mng'ongomtandala	
Phyllocosmus leimareanus	Msonifya	
Pleurostyliia africana		
Premna sp.		

<i>Protea madiensis</i>		
<i>Pseudolachnostylis maprouneifolia</i>	Mtungulu	
<i>Psorospermum febrifugum</i>	Mvivi	Fruit edible
<i>Psychotria eminiiana</i>		
<i>Pterocarpus angolensis</i>	Mninga	Timber
<i>Pterocarpus tinctorius</i>	Mkulungu	Timber
<i>Rhus longipes</i>	Msilanswagalo	
<i>Rhus vulgaris</i>	Kankiningi	
<i>Rytigynia decussata</i>		
<i>Rytigynia uhligii</i>	Msongwansimba	
<i>Rothmannia engleriana</i>	Mlozilozi, Mukondokondo	Fruit edible
<i>Schrebera trichoclada</i>	Mputika	
<i>Sclerocarya birrea</i>	Mng'ongo	Fruit edible
<i>Securidaca longepedunculata</i>	Mteywe	
<i>Sterculia africana</i>	Msawala	
<i>Sterculia quinqueloba</i>	Mkungulanga / Msavala / Msawala	
<i>Stereospermum kunthianum</i>		
<i>Strychnos innocua</i>	Mkulwa	Fruit edible
<i>Strychnos potatorum</i>	Mnyekenyeke, Mgwegwe	
<i>Strychnos pungens</i>	Mkome?	Fruit edible
<i>Strychnos spinosa</i>	Katonga, Mwaye	Fruit edible
<i>Syzygium guineense</i> subsp. <i>guineense</i>	Kashamongo	Riverine forest; fruit edible
<i>Tapiphyllum discolor</i>		
<i>Tamarindus indica</i>	Msisi (Swahili: Mkwaju)	Fruit edible (juice)
<i>Terminalia sericea</i> (T. <i>kaiseriana</i> )	Kazima	
<i>Terminalia mollis</i>	Mfufu	
<i>Trichilia emetica</i>	Mkalya	
<i>Uapaca kirkiana</i>	Mkusu	Fruit edible
<i>Uapaca nitida</i>	Mkokofinyo	Fruit edible
<i>Vangueria madagascariensis</i>	Mgelelya	Fruit edible
<i>Vangueriopsis lanciflora</i>	Mgelelya	Fruit edible
<i>Vitex doniana</i>	Mfuru	Fruit edible
<i>Vitex fischeri</i> ?		
<i>Vitex madiensis</i>	Mfululegea	Fruit edible
<i>Vitex mombassae</i>	Mfululegea	Fruit edible
<i>Vitex payos</i>	Mtalali	Fruit edible
<i>Xeroderris stuhlmannii</i>		

Ximenia americana?	Mtundwa	Fruit edible
Ximenia caffra	Kaguvaguva	Fruit edible
Xylopiantunesii	Mshenene	
Zanthoxylum chalybeum	Mlungulungu	
Ziziphus mucronata	Kagaole	Fruit edible
	Mlungwanyama (RT3: 2)	
	Mtandara (RT3: 2)	
<b>Total number of species: 151</b>		

## Appendix D: Location of the three transects in Kululu Community Forest Reserve





## Appendix E: Location of the three transect in Rungwa River Forest Reserve

