JAPAN INTERNATIONAL COOPERATION AGENCY (JICA) No. 02

MINISTRY OF ENVIRONMENT AND NATURAL RESOURCES (MENR)

THE REPUBLIC OF ZAMBIA

THE FOREST RESOURCES MANAGEMENT STUDY FOR ZAMBIA TEAK FORESTS IN SOUTH-WESTERN ZAMBIA

FINAL REPORT

Volume 3

(Data Section)

March, 1996

JAPAN FOREST CIVIL ENGINEERING CONSULTANTS FOUNDATION

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IN SOUTH-WESTERN ZAMBIA

FINAL REPORT Volume 1 (Summary Section)

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Purpose of Preparing Data Collection

The purpose of the Data Collection, which is to be attached to the separate book "Main Final Report of the Forest Resources Study on Zambia Teak Forests in South-Western Zambia" (hereinafter referred to as "Main Report"), is to describe the ways in which basic data were collected for the analyses referred to in the Main Report and to record such data so that the descriptions and records may be useful in conducting successive and/or demonstrative surveys in the future.

1. CIRCULAR PLOT SURVEY AND BELT-TRANSECT SURVEY

1.1. Field Notes

The target of these surveys are all trees whose diameter at breast height (DBH) is 6 cm or over. Included in these surveys are the tree height, tree diameter at breast height, clear length, crown length, crown diameter, a sketch of the plane figure to show the standing tree position and tree crown projection, and remarks. For details on the standing tree position in the plot refer to the Crown Projection Diagram and Forest Profile Diagram in the appendix of the Main Report. The items entered in the field notes are described below. (See Figure 1 on page 5.)

Items Entered in Field Notes on Circular Plot Survey and Belt-Transect Survey.

Date
Forest name
Location
Plot No.
Plot area

No.	Species	STC	DBH	T.H	C.l	Cr.l	Crn	Crs	Cre	Crw	Remarks

1) Date: Date of survey

2) Forest name: Name of forest

3) Location: Forest or woodland — includes characteristics of the forest

4) Plot No.: No. of every plot
   Example: If the temporary plot is T-○○, the belt-transect is B-○○.

5) Plot Area: Scale of relevant plot—In a circular plot survey, either 500 m² or 1,000 m² is entered. For a belt-transect survey, the extension and width are entered.

6) No.: No. of a single tree — Consecutive Nos. are assigned to each of the trees surveyed within a plot. In the case of plural stems deriving from one root, a stem with a breast height diameter of 6 cm or over was regarded as a single tree.

   While a vinyl tack was fixed to each tree surveyed in the permanent plots, no tack was fixed to trees at the site surveyed in temporary plots.

7) Species: Name of tree species — Local names (Logi names) were used as the names of tree species. On withered or broken trees or those beginning to be wither, we entered "Dead" in addition to the name of the species.

8) DBH: Diameter at breast height — In case the shape of the cross section of a tree was similar to a circle, the diameter was measured in one direction only. However, in case the shape of the cross section was irregular, diameters were measured in two directions, crossing at right angles to each other, and the simple average of the two values obtained were entered.

9) T.H: Tree height — The height from the ground surface to the treetop is to be entered. In case the stem is inclined, it is measured in the inclined direction.

10) C.l: Clear length — The height from the ground surface to the largest and lowest spreading branch is to be entered.

11) Cr.l: Crown length — The thickness of the crown from the lowest living branch to the treetop is to be entered.

12) Crn: Crown radius (north side) — Approximate lateral distance from the center of the stem toward the north is to be entered.

13) Crs: Crown radius (south side) — Approximate lateral distance from the center of the stem toward the south is to be entered.

14) Cre: Crown radius (east side) — Approximate lateral distance from the center of the stem toward the east is to be entered.

15) Crw: Crown radius (west side) — Approximate lateral distance from the center of the stem toward the west is to be entered.

In measuring the crown radius, if it was difficult to distinguish individual crowns in the case of a diversified stem (plural stems deriving from one root), first the main stem was determined by judging its tree height and diameter at breast height. Next, plural crowns were measured as a tree crown, and the result was considered as the data of the single tree which was to be the main stem. The crown radius of stems other than the main stem was disregarded. (Refer to the examples of Single Tree Nos. 12 to 14 in Figure 1.)

16) Remarks: In the case of diversified stems, the stem No. among the number of stems involved should be entered. In addition, the state of abnormal trees, for example, the direction of excessively bent stems or conditions of burnt or dead trees, should be entered.

1.2. Circular Plot Survey

Based on the forest tree data of the plot stated in the previous section, the volume table and yield table should be prepared. Refer to Sections 2.3.3 and 3.1 in the Main Report for further details on preparing these tables. The process of preparing plot data from the single-tree data obtained through plot surveys as well as the plot data themselves is described below.

1.2.1. Values calculated from single-tree data (recorded in field notes) (Table 1)

DBH: In the case of diversified stems, plural stems should be treated as one tree. Accordingly, DBH of the representative tree should also be determined through equivalency calculation. Single Tree Nos. 12 to 14 in Table 1 are given here as examples.

Single Tree No. 12, with its large values in both tree height and DBH, was selected as the main stem. The total of cross-section areas of individual single trees shall be the cross-section area at breast height (equivalent cross-section area) of Single Tree No. 12.

G(No. 12) (equivalent cross-section area) = $\sum$G(Nos. 12-14)
= G(No.12) + G(No.13) + G(No.14) (m^2)
= Cross-section area at breast height of Tree No. 12

Next, through inverse operation from the above result, the diameter at breast height of Single Tree No. 12 (equivalent diameter) shall be calculated.

DBH (No.12) (equivalent diameter) = $200 \times [G(No.12) \times \pi]^{0.5}$ (cm)

G : Cross-section area at breast height (m^2) calculated from DBH

Crm : The average crown radius (m) to be calculated from crown radiuses in four directions. In the case of a diversified stem, the crown radius of stems other than the main stem shall be regarded as zero.

α : (Coefficient of crown expansion) — the coefficient of crown expansion in case crown shapes are presumably displayed with a parabola.

$$\alpha = Crm/(Cr.l)^{0.5}$$

CG : (Crown projection area)

$$CG = \pi \times Crm^2$$

DS : Square root of the area occupied by the crown on the assumption that crowns would not be overlapped.

$$DS = (\pi \times Crm^2)^{0.5} = (CG)^{0.5}$$

Nc : Density of forest crown — the maximum crown density, provided the crowns do not overlap.

$$Nc = 10000/(DS)^2$$

1.2.2. Data of individual plots

Table 2 indicates the plot data averaged (or totaled for some items) from the values obtained for the items in Table 1. Based on the tree height, single trees in the plot were classified into three classes, i.e., High Stratum ($H > 12m$), Middle Stratum ($8m < H \leq 12m$), and Low Stratum ($H \leq 8m$), and the total (or the average) was calculated for each class. An explanation of individual items is provided below.

n : Number of forest trees in the plot whose diameters at breast height were 6 m or over.

N : Number of forest trees per ha calculated from n

$$N = n \times 10000/\text{plot area}$$

H : Simple average value (m) of T.H

D : Simple average value (cm) of DBH

v : Volume of a single tree — the volume of a single tree (m^3/tree) calculated using the volume table of Mukusi prepared as referred to in Sect. 2.3.3, "Preparation of Volume Table" in the Main Report. In this case, the tree height and the diameter at breast height to be used shall be the above H and D values (the average value of the data within the plot).

V : Volume per ha (m^3/ha)

$$V = v \times N \ (m^3/ha)$$

$\overline{G}$: Simple average value (m^2) of G (cross-section area at breast height)

ΣG : Total value (m^2) of G (cross-section areas at breast height)

$\overline{Cr.l}$: Simple average value (m) of Cr.l (crown length)

$\overline{Crm}$: Simple average value (m) of Crm (crown radius)

$\overline{\alpha}$: Simple average value of α (coefficient of crown expansion)

C.d : cross-section area rate (%) of crown per ha

$$C.d = (\overline{Crm})^2 \times N/10,000 \times 100 = (\overline{Crm})^2 \times N/100 \ (\%)$$

$\overline{G}$xN : Total cross-section area (m^2) at breast height

Only Mukusi data are taken from the data in each plot, and calculation as indicated above is carried out. The results are shown in Table 3.

1.3. Data of Belt-Transect Survey

By conducting a belt-transect survey, the forest stand composition can be exactly grasped. Through these surveys, various data are available including tree species, height class composition, crown scale and crown coverage rate. Also, a variety of information will be obtained for use in preparing the Forest Inventory Book, which would be the base of resource surveys.

Moreover, as mentioned in the section of vegetation surveys intended for preparing vegetation maps, a series of belt-transect surveys for various vegetation — from forests to woodlands — may constitute useful references for examining shifts and renewal of Mukusi Forests in our future management of resources. The data of major belt-transect surveys conducted in places other than Permanent Plots are listed below.

Figure 2 and Table 3 indicate the state of the belt-transect in the Lumino forest. The dominant tree species dominant in this forest was Mwangula. While the upper tree crown coverage rate was 93%, the crown coverage rate of Mukusi alone was 17%. From the profile diagram of Mwangula, the state of the multi-stems can be well understood.

Figure 3 and Table 4 indicate the state of the belt-transect in the Sikubingwa forest. Mukusi is mixed with Mwangula and the maximum height class was 22 m, which was the highest in all places surveyed.

Figure 4 and Table 5 also indicate the state of belt-transects established in the Sikubingwa forest. As indicated in its profile diagram, the Mukusi stand is dominant both in the upper and lower trees.

Figure 1 Example of field note: Circular plot in Shikbingwa forest

1)Date	14.Feb.95
2)Forest name	Shikbingwa Forest
3)Location	closed forest
4)Plot No.	T98
5)Plot Area	500㎡

6)No.	7)Species	8)DBH	9)T.H	10)C.l	11)Cr.l	12)Crn	13)Crs	14)Cre	15)Crw	16)Remarks
1	Mukusi	23.2	13.5	10.5	2.5	1	1.4	2.3	1	
2	Mukusi	31.8	14	8	3.5	4.1	6.2	3	6.6	2-1
3	Mukusi	33.6	14	7	3	4.1	6.2	10	-3	2-2
4	Kangolo	7.2	4	2	1	0.9	4.2	0.9	2.8	
5	Mukusi	63.2	16.5	11	5	6.4	7.9	3.6	4.7	
6	Mukusi	26.2	13.5	6.5	2.5	2	6.1	1.5	8.8	
7	Mukusi Dead	13	7	-	-	-	-	-	-	
8	Mukusi	41.4	15.5	10	3	4.4	6.5	2.9	9	
9	Mukusi	24.8	12.5	6	3	5.6	2.6	4	2.8	
10	Mukololo	8.2	8	6	1	1	3	0	2	
11	Mukusi	35.8	13	4.5	2.5	6	7.3	1.6	6.4	
12	Mwangula	13.6	8	4	2	4.2	3.4	3.7	5	3-1
13	Mwangula	9.2	8	4	-	-	-	-	-	3-2
14	Mwangula	10.2	8	4	-	-	-	-	-	3-3
15	Mulalabainga	6.2	5	1	1	1.1	1.9	2	1.2	
16	Isunde	6.2	5	2	1	2	1.2	2.2	0.8	
17	Mukusi	58.6	18.5	9	4.5	5.3	8.1	5	10	
18	Mwangula	7.2	7	2	1	1	4	1.7	1.5	
19	Mukusi	51.8	20	12	4	10.1	3.5	2.6	8	
20	Kangolo	6.4	4	2	1.5	2.4	2	0	5.2	
21	Kangolo	6.8	5	2	1	0.8	1.9	3.4	2	
22	Mukusi	21.8	4	-	-	-	-	-	-	
23	Mukusi	43.4	10	8	2	5.2	2	4.9	1.6	top was broken off

Table 1 Values calculated from field data (from Figure 1)

1)Date	14.Feb.95
2)Forest name	Shikbingwa Forest
3)Location	closed forest
4)Plot No.	T98
5)Plot Area	500㎡

6)No.	7)Species	8)DBH	DBH	G	Crn	α	CG	DS	Nc	6)Remarks
1	Mukusi	23.2	23.2	0.0423	1.4	0.89	6	2.4	1736	
2	Mukusi	31.8	31.8	0.0794	5.0	2.67	79	8.9	126	2-1
3	Mukusi	33.6	33.6	0.0887	4.3	2.48	58	7.6	173	2-2
4	Kangolo	7.2	7.2	0.0041	2.2	2.20	15	3.9	657	
5	Mukusi	63.2	63.2	0.3137	5.7	2.55	102	10.1	98	
6	Mukusi	26.2	26.2	0.0539	4.6	2.91	66	8.1	152	
7	Mukusi Dead	13	13.0	0.0133	-		-	-	-	
8	Mukusi	41.4	41.4	0.1346	5.7	3.29	102	10.1	98	
9	Mukusi	24.8	24.8	0.0483	3.8	2.19	45	6.7	223	
10	Mukololo	8.2	8.2	0.0053	1.5	1.50	7	2.6	1479	
11	Mukusi	35.8	35.8	0.1007	5.3	3.35	88	9.4	113	
12	Mwangula	13.6	13.6	0.0145	4.1	2.90	53	7.3	188	3-1
13	Mwangula	9.2	9.2	0.0066	-		-	-	-	3-2
14	Mwangula	10.2	10.2	0.0082	-		-	-	-	3-3
			19.3	0.0293						
				↓						
12	Mwangula	13.6	19.3	0.0293	4.1	2.90	53	7.3	188	3-1
13	Mwangula	9.2	9.2	0.0066	-		-	-	-	3-2
14	Mwangula	10.2	10.2	0.0082	-		-	-	-	3-3
15	Mulalabainga	6.2	6.2	0.0030	1.6	1.60	8	2.8	1276	
16	Isunde	6.2	6.2	0.0030	1.6	1.60	8	2.8	1276	
17	Mukusi	58.6	58.6	0.2697	7.1	3.35	158	12.6	63	
18	Mwangula	7.2	7.2	0.0041	2.1	2.10	14	3.7	730	
19	Mukusi	51.8	51.8	0.2107	6.1	3.05	117	10.8	86	
20	Kangolo	6.4	6.4	0.0032	2.4	1.96	18	4.2	567	
21	Kangolo	6.8	6.8	0.0036	2.0	2.00	13	3.6	772	
22	Mukusi	21.8	21.8	0.0373	-	-	-	-	-	
23	Mukusi	43.4	43.4	0.1479	3.4	2.40	36	6.0	278	top was broken off

Table 2 (1) Total data of all plots

PL	Area	n	N	H	D	v	V	$\bar{G}$	ΣG	$\overline{Cr.l}$	$\overline{Crm}$	$\bar{\alpha}$	C.d	$\bar{G}$×N
(High stratum)														
B02	500	7	140	15.1	55.3	1.875	262.5	0.2592	1.8145	4.9	6.0	2.70	158.3	36.3
B03	1,000	9	90	14.7	46.5	1.452	130.7	0.1770	1.5928	4.8	5.9	2.72	98.4	15.9
B04	1,000	6	60	13.8	35.3	0.816	49.0	0.1067	0.6403	4.2	4.4	2.11	36.5	6.4
B05	500	6	120	15.8	36.6	1.030	123.6	0.1091	0.6547	4.7	4.7	2.21	83.3	13.1
B07	500	2	40	13.0	45.3	1.172	46.9	0.1612	0.3224	5.0	5.0	2.24	31.4	6.4
B08	1,000	29	290	15.4	33.3	0.786	227.9	0.0997	2.8910	5.3	4.7	2.02	201.3	28.9
B10	500	12	240	14.7	37.8	1.012	242.9	0.1205	1.4457	4.3	4.7	2.30	166.6	28.9
B11	1,000	4	40	13.3	36.8	0.837	33.5	0.1281	0.5122	3.8	3.7	1.89	17.2	5.1
B14	1,000	13	130	13.5	24.1	0.399	51.9	0.0469	0.6093	5.5	3.0	1.31	36.8	6.1
B15	1,000	15	150	14.5	39.7	1.106	165.9	0.1284	1.9254	0.0	5.4	0.00	137.4	19.3
T001	500	9	180	15.8	38.9	1.130	203.4	0.1284	1.1558	5.1	4.8	2.15	130.3	23.1
T002	500	6	120	13.3	31.0	0.607	72.8	0.0832	0.4992	5.3	4.3	1.88	69.7	10
T003	500	10	200	14.8	38.7	1.059	211.8	0.1238	1.2382	5.3	4.4	1.94	121.6	24.8
T004	500	5	100	13.8	33.6	0.775	77.5	0.0980	0.4901	5.2	5.2	2.28	84.9	9.8
T005	500	2	40	13.5	40.0	1.033	41.3	0.1270	0.2539	5.0	4.9	2.19	30.2	5.1
T006	500	2	40	14.5	57.0	1.987	79.5	0.2898	0.5796	6.0	6.3	2.55	49.9	11.6
T007	500	7	140	13.7	33.7	0.775	108.5	0.0931	0.6517	5.3	5.2	2.23	118.9	13
T008	500	11	220	14.0	30.5	0.654	143.9	0.0793	0.8721	5.4	3.9	1.69	105.1	17.4
T009	500	3	60	14.0	46.5	1.355	81.3	0.1991	0.5973	5.3	5.6	2.44	59.1	11.9
T010	500	3	60	15.0	71.9	2.883	173.0	0.4126	1.2378	6.3	6.6	2.63	82.1	24.8
T011	500	7	140	15.1	49.3	1.556	217.8	0.1985	1.3892	4.9	6.6	2.99	191.6	27.8
T012	500	10	200	17.1	36.2	1.043	208.6	0.1146	1.1464	5.7	4.5	1.86	127.2	22.9
T013	500	8	160	13.3	23.4	0.340	54.4	0.0457	0.3654	4.1	3.4	1.66	58.1	7.3
T014	500	2	40	13.5	33.0	0.734	29.4	0.0894	0.1788	4.5	4.9	2.33	30.2	3.6
T015	500	10	200	13.9	16.9	0.194	38.8	0.0234	0.2343	5.4	3.4	1.47	72.6	4.7
T016	500	1	20	13.0	41.9	1.043	20.9	0.1382	0.1382	4.0	6.0	3.00	22.6	2.8
T017	500	2	40	13.0	28.0	0.501	20.0	0.0697	0.1393	4.0	3.9	1.93	19.1	2.8
T018	500	13	260	13.2	18.2	0.204	53.0	0.0293	0.3809	4.6	3.2	1.48	83.6	7.6
T019	500	14	280	13.5	26.1	0.468	131.0	0.0696	0.9750	5.0	3.6	1.56	114	19.5
T020	500	10	200	13.8	26.3	0.468	93.6	0.0671	0.6710	4.1	4.0	1.96	100.5	13.4
T021	500	6	120	13.8	33.3	0.734	88.1	0.0923	0.5536	4.5	4.9	2.30	90.5	11.1
T022	500	8	160	13.9	31.5	0.694	111.0	0.0855	0.6842	4.9	4.2	1.88	88.7	13.7
T023	500	11	220	13.8	30.4	0.616	135.5	0.0744	0.8184	4.0	4.9	2.46	165.9	16.4
T024	500	6	120	14.0	36.0	0.859	103.1	0.1052	0.6309	5.2	4.7	2.06	83.3	12.6
T025	500	9	180	13.6	31.9	0.694	124.9	0.0950	0.8547	4.1	4.7	2.28	124.9	17.1
T026	500	16	320	13.9	21.3	0.304	97.3	0.0397	0.6358	4.4	2.7	1.26	73.3	12.7
T027	500	6	120	14.0	62.0	2.118	254.2	0.3217	1.9300	5.2	6.6	2.89	164.2	38.6
T028	500	11	220	13.6	31.3	0.654	143.9	0.0863	0.9493	4.7	4.1	1.87	116.2	19
T029	500	1	20	15.0	44.0	1.302	26.0	0.1521	0.1521	7.0	5.8	2.19	21.1	3
T030	500	4	80	13.8	45.1	1.262	101.0	0.1716	0.6863	5.3	5.7	2.48	81.7	13.7
T031	500	11	220	13.7	35.5	0.859	189.0	0.1140	1.2538	4.5	5.0	2.43	172.8	25.1
T032	500	8	160	13.9	37.3	0.902	144.3	0.1160	0.9278	5.0	4.6	2.05	106.4	18.6
T033	500	4	80	13.5	35.5	0.859	68.7	0.1080	0.4319	4.8	6.0	2.75	90.5	8.6
T034	500	7	140	13.0	17.1	0.180	25.2	0.0235	0.1642	3.7	2.8	1.44	34.5	3.3
T035	500	3	60	14.3	72.1	2.690	161.4	0.4989	1.4967	5.0	9.5	4.31	170.1	29.9
T036	500	1	20	13.0	20.0	0.255	5.1	0.0314	0.0314	4.0	2.8	1.40	4.9	0.6
T037	500	1	20	13.0	42.0	1.043	20.9	0.1385	0.1385	5.0	4.3	1.92	11.6	2.8
T038	500	19	380	14.5	26.2	0.501	190.4	0.0571	1.0841	4.5	3.7	1.74	163.4	21.7
T040	500	7	140	13.9	31.5	0.694	97.2	0.0830	0.5812	4.4	4.9	2.30	105.6	11.6

Table 2 (2) Total data of all plots

PL	Area	n	N	H	D	v	V	$\overline{G}$	ΣG	$\overline{Cr.l}$	$\overline{Crm}$	$\overline{\alpha}$	C.d	$\overline{G}\times N$
(High stratum)														
T041	500	6	120	14.2	33.5	0.775	93.0	0.0938	0.5625	3.8	4.5	2.33	76.3	11.3
T042	500	11	220	13.9	28.0	0.540	118.8	0.0643	0.7069	4.5	4.5	2.11	140	14.1
T043	500	6	120	13.7	33.7	0.775	93.0	0.0952	0.5714	3.8	5.2	2.64	101.9	11.4
T044	500	7	140	13.4	26.4	0.434	60.8	0.0566	0.3964	5.0	4.4	1.98	85.1	7.9
T045	500		0	0.0	0.0	0.000	0.0	0.0000	0.0000	0.0	0.0	0.00	0	0
T046	500	20	400	15.1	31.7	0.743	297.2	0.0826	1.6515	4.7	3.5	1.59	153.9	33
T047	500	7	140	14.3	40.8	1.078	150.9	0.1343	0.9400	3.9	5.7	2.90	142.9	18.8
T048	500	13	260	14.8	36.1	0.921	239.5	0.1105	1.4363	4.2	4.2	2.08	144.1	28.7
T049	500	10	200	14.0	38.8	0.988	197.6	0.1290	1.2902	3.1	5.0	3.01	157.1	25.8
T050	500	15	300	15.2	35.8	0.921	276.3	0.1164	1.7456	4.2	3.7	1.80	129	34.9
T051	500	7	140	14.7	40.0	1.106	154.8	0.1704	1.1928	3.6	4.1	2.16	73.9	23.9
T052	500	8	160	16.0	45.0	1.443	230.9	0.1869	1.4948	4.6	4.7	2.21	111	29.9
T053	500	3	60	15.3	52.9	1.767	106.0	0.2357	0.7070	5.0	6.1	2.76	70.1	14.1
T054	1,000	5	50	14.8	50.6	1.661	83.1	0.2100	1.0500	4.8	6.1	2.83	58.4	10.5
T055	1,000	5	50	14.8	51.0	1.661	83.1	0.2107	1.0533	6.0	5.3	2.16	44.1	10.5
T056	1,000	1	10	15.0	52.3	1.714	17.1	0.2148	0.2148	7.0	5.5	2.08	9.5	2.1
T057	1,000	2	20	14.0	49.2	1.452	29.0	0.1965	0.3929	6.0	5.5	2.25	19	3.9
T058	1,000	5	50	14.0	43.8	1.216	60.8	0.1542	0.7711	7.2	5.4	2.02	45.8	7.7
T059	1,000	3	30	13.8	55.9	1.803	54.1	0.2468	0.7404	8.2	6.1	2.14	35.1	7.4
T060	1,000	4	40	15.9	60.0	2.298	91.9	0.2845	0.7959	8.5	6.8	2.35	58.1	11.4
T061	1,000	6	60	13.1	45.4	1.172	70.3	0.1645	0.9868	5.2	4.4	1.93	36.5	9.9
T062	1,000	5	50	15.3	56.4	1.932	96.6	0.2531	1.2653	7.2	5.6	2.09	49.3	12.7
T063	1,000	6	60	14.2	43.8	1.216	73.0	0.1596	0.9577	5.1	5.5	2.39	57	9.6
T064	1,000	3	30	13.5	36.8	0.902	27.1	0.1089	0.6534	6.1	4.2	1.68	16.6	3.3
T065	1,000	6	60	15.1	41.7	1.203	72.2	0.1500	0.9002	4.7	4.8	2.25	43.4	9
T066	1,000	11	110	14.1	31.6	0.694	76.3	0.0808	0.8891	5.6	4.3	1.79	63.9	8.9
T067	1,000	1	10	18.0	55.0	2.249	22.5	0.2376	0.2376	8.0	6.4	2.26	12.9	2.4
T068	1,000	2	20	15.0	52.0	1.714	34.3	0.2237	0.4474	6.5	6.8	2.66	29.1	4.5
T069	1,000	15	150	15.5	37.3	1.030	154.5	0.1285	2.8279	6.3	4.2	1.67	83.1	19.3
T070	1,000	2	20	14.0	47.0	1.355	27.1	0.1738	0.3476	6.5	6.2	2.43	24.2	3.5
T071	1,000	4	40	14.9	48.4	1.504	60.2	0.1907	0.7628	6.5	6.5	2.51	53.1	7.6
T072	1,000	3	30	16.3	55.7	2.061	61.8	0.2504	0.7512	6.3	7.2	2.86	48.9	7.5
T073	1,000	6	60	15.1	55.1	1.875	112.5	0.2653	1.5920	7.0	6.2	2.33	72.5	15.9
T074	500	10	200	13.8	33.5	0.775	155.0	0.1012	1.0124	5.0	4.2	1.88	110.8	20.2
T075	1,000	5	50	14.6	39.2	1.059	53.0	0.1247	0.6236	6.4	4.5	1.81	31.8	6.2
T076	500	7	140	13.6	36.1	0.859	120.3	0.1122	0.7854	5.0	5.1	2.24	114.4	15.7
T077	500	10	200	14.3	30.5	0.654	130.8	0.0821	0.8211	6.0	4.0	1.64	100.5	16.4
T078	500	8	160	15.8	40.4	1.180	188.8	0.1321	1.0564	5.5	5.5	2.40	152.1	21.1
T079	1,000	5	50	16.5	51.4	1.882	94.1	0.2167	1.0833	6.2	5.5	2.18	47.5	10.8
T080	500	8	160	15.8	33.8	0.886	141.8	0.0958	0.7664	4.8	3.7	1.69	68.8	15.3
T081	500	10	200	16.0	36.5	1.030	206.0	0.1173	1.1727	4.9	3.9	1.80	95.6	23.5
T082	500	11	220	15.5	37.7	1.080	237.6	0.1250	1.3752	6.0	5.2	2.12	186.9	27.5
T083	500	14	280	15.6	41.9	1.283	359.2	0.1587	2.2217	6.3	6.4	2.54	360.3	44.4
T084	500	11	220	15.5	33.3	0.839	184.6	0.1034	1.1377	5.6	4.9	1.99	165.9	22.7
T085	500	6	120	14.3	36.5	0.902	108.2	0.1062	0.6373	5.5	4.8	2.03	86.9	12.7
T086	1,000	7	70	14.6	37.2	0.966	67.6	0.1172	0.8202	5.4	5.0	2.13	55	8.2
T087	500	13	260	14.0	34.6	0.816	212.2	0.0997	1.2961	4.5	3.3	1.56	89	25.9
T088	1,000	13	130	13.6	36.8	0.902	117.3	0.1211	1.5748	4.2	4.0	1.96	65.3	15.7
T089	500	8	160	14.3	39.8	1.033	165.3	0.1318	1.5184	5.7	5.3	2.21	141.2	21.1

Table 2 (3) Total data of all plots

PL	Area	n	N	H	D	v	V	$\bar{G}$	ΣG	$\overline{Cr.l}$	$\overline{Crm}$	$\bar{\alpha}$	C.d	$\bar{G}$×N
(High stratum)														
T090	500	10	200	13.7	37.8	0.945	189.0	0.1158	1.6858	5.4	4.0	1.72	100.5	23.2
T091	500	12	240	14.3	35.3	0.816	195.8	0.0995	1.1936	5.8	4.2	1.76	133	23.9
T092	1,000	12	120	18.2	32.6	0.944	113.3	0.0969	1.1627	5.5	3.9	1.64	57.3	11.6
T093	500	7	140	14.9	45.8	1.401	196.1	0.1706	1.1945	6.1	5.0	2.01	110	23.9
T094	1,000	3	30	15.8	43.6	1.389	41.7	0.1520	0.4561	5.7	5.7	2.39	30.6	4.6
T095	500	7	140	14.3	32.2	0.694	97.2	0.0843	0.5902	4.4	4.4	2.13	85.1	11.8
T096	500	8	160	14.9	34.3	0.831	133.0	0.1009	0.8074	3.5	4.5	2.44	101.8	16.1
T097	500	9	180	13.6	33.9	0.775	139.5	0.1118	1.0059	3.6	4.6	2.46	119.7	20.1
T098	500	10	200	15.1	39.0	1.059	211.8	0.1342	1.3420	3.4	4.9	2.67	150.9	26.8
T099	1,000	10	100	15.1	39.0	1.059	105.9	0.1342	1.3420	3.4	4.9	2.67	75.4	13.4
T100	500	9	180	15.4	30.9	0.701	126.2	0.0790	0.7112	3.7	3.7	1.96	77.4	14.2
T101	500	7	140	13.1	27.3	0.467	65.4	0.0636	0.4453	3.2	3.4	1.89	50.8	8.9
T102	500	2	40	13.0	24.0	0.371	14.8	0.0452	0.0904	2.5	3.2	2.09	12.9	1.8
T103	500	2	40	13.5	24.9	0.433	17.3	0.0488	0.0975	2.3	2.9	1.95	10.6	2
T104	500	2	40	13.5	42.5	1.169	46.8	0.1584	0.3168	4.5	5.0	2.34	31.4	6.3
T105	500	4	80	14.1	40.5	1.078	86.2	0.1328	0.5310	4.0	4.6	2.30	53.2	10.6
T106	500	2	40	15.0	52.4	1.714	68.6	0.2487	0.4974	5.5	7.4	3.20	68.8	9.9
T107	1,000	3	30	16.7	45.4	1.533	46.0	0.1633	0.4899	5.7	4.0	1.72	15.1	4.9
T108	1,000	15	150	14.1	31.9	0.694	104.1	0.0818	1.2269	4.2	4.2	2.09	83.1	12.3
T109	500	10	200	14.5	28.6	0.618	123.6	0.0666	0.6660	3.1	3.6	2.08	81.4	13.3
T110	500	8	160	14.5	36.8	0.966	154.6	0.1093	0.8744	4.6	4.7	2.21	111	17.5
T112	1,000	19	190	16.9	36.1	1.043	198.2	0.1104	2.0985	5.8	4.9	2.05	143.3	21

Table 2 (4) Total data of all plots

PL	Area	n	N	H	D	v	V	$\bar{G}$	ΣG	$\overline{Cr.l}$	$\overline{Crm}$	$\bar{\alpha}$	C.d	$\bar{G}$×N
(Middle stratum)														
B02	500	3	60	11.0	22.5	0.288	17.3	0.0570	0.1709	3.3	3.4	1.90	21.8	3.4
B03	1,000	1	10	11.0	28.3	0.424	4.2	0.0628	0.0628	3.0	4.5	2.60	6.4	0.6
B04	1,000	11	110	10.6	19.8	0.216	23.8	0.0320	0.3524	3.5	2.8	1.52	27.1	3.5
B05	500	7	140	10.7	22.8	0.288	40.3	0.0470	0.3291	3.0	3.0	1.76	39.6	6.6
B07	500	7	140	10.4	22.9	0.262	36.7	0.0445	0.3118	3.9	2.7	1.37	32.1	6.2
B08	1,000	16	160	10.4	16.0	0.121	19.4	0.0253	0.4045	3.5	3.0	1.61	45.2	4
B10	500	6	120	11.0	23.7	0.314	37.7	0.0501	0.3005	3.7	3.7	1.90	51.6	6
B11	1,000	29	290	10.7	21.4	0.263	76.3	0.0425	1.2337	3.0	2.9	1.73	76.6	12.3
B14	1,000	46	460	10.4	15.0	0.105	48.3	0.0200	0.9217	3.6	2.3	1.18	76.4	9.2
B15	1,000	5	50	10.8	20.4	0.216	10.8	0.0351	0.1756	0.0	4.7	0.00	34.7	1.8
T001	500	2	40	10.0	23.0	0.262	10.5	0.0511	0.1021	3.5	3.1	1.67	12.1	2
T002	500	4	80	11.0	14.5	0.115	9.2	0.0171	0.0682	4.0	2.7	1.39	18.3	1.4
T003	500	3	60	11.0	16.0	0.133	8.0	0.0203	0.0609	4.7	2.6	1.19	12.7	1.2
T004	500	1	20	9.0	6.0	0.011	0.2	0.0028	0.0028	4.0	1.8	0.90	2	0.1
T005	500	3	60	12.0	26.0	0.401	24.1	0.0550	0.1649	4.7	3.9	1.83	28.7	3.3
T006	500	6	120	10.2	13.7	0.089	10.7	0.0151	0.0908	4.5	3.6	1.74	48.9	1.8
T007	500	1	20	12.0	22.0	0.287	5.7	0.0380	0.0380	4.0	3.3	1.65	6.8	0.8
T008	500	7	140	11.3	19.4	0.193	27.0	0.0323	0.2262	3.6	2.3	1.16	23.3	4.5
T009	500	2	40	10.0	23.0	0.262	10.5	0.0423	0.0845	4.0	2.4	1.26	7.2	1.7
T010	500	2	40	12.0	28.0	0.463	18.5	0.0628	0.1256	5.5	3.8	1.62	18.1	2.5
T011	500	2	40	11.0	30.0	0.484	19.4	0.0735	0.1470	4.0	5.2	2.63	34	2.9
T012	500	1	20	12.0	22.0	0.287	5.7	0.0380	0.0380	4.0	4.5	2.25	12.7	0.8
T013	500	18	360	11.4	16.1	0.133	47.9	0.0217	0.3904	3.3	2.1	1.16	49.9	7.8
T014	500	5	100	10.2	14.8	0.105	10.5	0.0198	0.0989	4.4	3.1	1.48	30.2	2
T015	500	12	240	10.5	14.0	0.098	23.5	0.0178	0.2135	4.3	3.2	1.52	77.2	4.3
T016	500	6	120	11.2	22.3	0.263	31.6	0.0516	0.3093	4.0	3.5	1.75	46.2	6.2
T017	500	10	200	11.2	20.5	0.239	47.8	0.0400	0.3997	3.5	3.4	1.75	72.6	8
T018	500	13	260	11.2	11.8	0.068	17.7	0.0128	0.1661	4.3	2.4	1.15	47	3.3
T019	500	17	340	10.8	11.1	0.055	18.7	0.0106	0.2419	3.6	1.8	0.95	34.6	3.6
T020	500	8	160	10.4	13.6	0.089	14.2	0.0225	0.1796	3.3	2.4	1.32	29	3.6
T021	500	3	60	12.0	18.0	0.188	11.3	0.0263	0.0788	3.3	3.2	1.73	19.3	1.6
T022	500	4	80	11.0	18.6	0.193	15.4	0.0274	0.1096	3.0	1.8	1.04	8.1	2.2
T023	500	4	80	11.8	30.0	0.528	42.2	0.0721	0.2884	3.5	5.2	2.78	68	5.8
T024	500	9	180	11.6	22.2	0.287	51.7	0.0429	0.3858	3.9	3.2	1.65	57.9	7.7
T025	500	19	380	10.8	15.2	0.115	43.7	0.0197	0.3746	2.8	2.6	1.57	80.7	7.5
T026	500	21	420	10.5	12.4	0.068	28.6	0.0132	0.2767	3.1	1.8	1.01	42.8	5.5
T027	500	4	80	11.0	29.4	0.453	36.2	0.0771	0.2312	4.3	4.4	2.12	48.7	6.2
T028	500	9	180	10.1	11.7	0.062	11.2	0.0121	0.1089	3.8	2.1	1.12	24.9	2.2
T029	500	5	100	11.4	32.4	0.545	54.5	0.0895	0.4477	4.6	5.3	2.39	88.2	9
T030	500	4	80	11.0	26.8	0.396	31.7	0.0642	0.2567	4.3	3.4	1.63	29.1	5.1
T031	500	4	80	10.3	13.7	0.089	7.1	0.0178	0.0713	4.0	2.6	1.30	17	1.4
T033	500	6	120	11.8	31.0	0.561	67.3	0.0886	0.5315	4.0	4.3	2.14	69.7	10.6
T034	500	24	480	11.0	12.3	0.068	32.6	0.0131	0.3155	3.3	2.0	1.14	60.3	6.3
T035	500	4	80	10.8	18.8	0.193	15.4	0.0283	0.1132	4.3	3.4	1.66	29.1	2.3
T036	500	14	280	10.6	20.0	0.216	60.5	0.0367	0.5136	3.4	3.4	1.81	101.7	10.3
T037	500	13	260	11.1	22.3	0.263	68.4	0.0413	0.5373	3.2	3.7	2.12	111.8	10.7
T038	500	11	220	10.8	16.6	0.152	33.4	0.0240	0.2638	3.3	2.4	1.32	39.8	5.3
T039	500	6	120	10.7	17.4	0.152	18.2	0.0266	0.1595	2.8	2.8	1.68	29.6	3.2
T040	500	7	140	10.7	22.7	0.288	40.3	0.0488	0.3418	2.9	3.6	2.16	57	6.8

Table 2 (5) Total data of all plots

PL	Area	n	N	H	D	v	V	$\overline{G}$	ΣG	$\overline{Cr.l}$	$\overline{Crm}$	$\overline{\alpha}$	C.d	$\overline{G}$×N
(Middle stratum)														
T041	500	10	200	10.4	18.2	0.157	31.4	0.0296	0.2958	2.5	2.8	1.86	49.3	5.9
T042	500	7	140	10.9	15.5	0.133	18.6	0.0206	0.1445	3.3	2.9	1.67	37	2.9
T043	500	9	180	10.0	18.2	0.157	28.3	0.0278	0.2499	3.2	2.8	1.61	44.3	5
T044	500	21	420	10.6	14.2	0.098	41.2	0.0184	0.3871	3.3	2.5	1.35	82.5	7.7
T045	500	20	400	10.2	18.3	0.157	62.8	0.0310	0.6206	2.8	3.3	2.04	136.8	12.4
T046	500	4	80	10.3	18.0	0.157	12.6	0.0284	0.1136	3.3	1.8	0.96	8.1	2.3
T047	500	8	160	10.8	20.7	0.239	38.2	0.0360	0.2878	2.9	3.5	2.03	61.6	5.8
T048	500	2	40	10.0	15.0	0.105	4.2	0.0184	0.0367	2.5	1.7	1.05	3.6	0.7
T049	500	3	60	11.3	25.8	0.367	22.0	0.0567	0.1700	2.7	3.9	2.35	28.7	3.4
T050	500	3	60	11.0	23.2	0.288	17.3	0.0494	0.1483	3.0	2.9	1.69	15.9	3
T051	500	2	40	11.0	38.8	0.777	31.1	0.1259	0.2518	2.0	4.4	3.11	24.3	5
T052	500	8	160	10.9	24.0	0.314	50.2	0.0536	0.4290	3.3	3.1	1.70	48.3	8.6
T053	500	6	120	11.7	34.5	0.700	84.0	0.1073	0.6440	2.8	3.7	2.33	51.6	12.9
T054	1,000	1	10	9.0	18.0	0.141	1.4	0.0254	0.0254	3.0	3.0	1.73	2.8	0.3
T056	1,000	2	20	12.0	53.8	1.457	29.1	0.2309	0.4617	5.5	6.1	2.77	23.4	4.6
T057	1,000	1	10	12.0	49.5	1.286	12.9	0.1924	0.1924	3.0	5.3	3.06	8.8	1.9
T060	1,000	2	20	9.8	40.5	0.770	15.4	0.1290	0.2580	5.3	4.9	2.14	15.1	2.6
T061	1,000	2	20	11.3	38.5	0.777	15.5	0.1188	0.2376	3.5	3.6	1.89	8.1	2.4
T063	1,000	2	20	10.5	22.0	0.263	5.3	0.0388	0.0775	4.0	2.9	1.45	5.3	0.8
T064	1,000	6	60	10.3	28.2	0.385	23.1	0.0701	0.4203	4.3	3.1	1.47	18.1	4.2
T065	1,000	2	20	9.0	20.1	0.176	3.5	0.0318	0.0636	2.8	3.2	1.93	6.4	0.6
T066	1,000	3	30	11.7	29.3	0.495	14.9	0.0679	0.2038	4.7	4.8	2.24	21.7	2
T067	1,000	7	70	9.2	22.6	0.236	16.5	0.0404	0.2825	3.9	3.1	1.57	21.1	2.8
T068	1,000	2	20	10.5	28.5	0.453	9.1	0.0657	0.1313	5.5	3.4	1.46	7.3	1.3
T069	1,000	2	20	12.0	26.0	0.401	8.0	0.0534	0.1068	4.5	3.2	1.50	6.4	1.1
T070	1,000	5	50	11.2	36.8	0.708	35.4	0.1076	0.5380	5.0	6.1	2.78	58.4	5.4
T071	1,000	4	40	10.2	21.7	0.239	9.6	0.0382	0.1684	4.6	3.3	1.53	13.7	1.5
T072	1,000	4	40	11.0	26.1	0.367	14.7	0.0571	0.2283	5.4	4.3	1.83	23.2	2.3
T073	1,000	5	50	10.2	17.7	0.157	7.9	0.0267	0.1337	4.4	2.5	1.18	9.8	1.3
T074	500	6	120	10.9	16.8	0.152	18.2	0.0226	0.1353	3.0	2.7	1.64	27.5	2.7
T075	1,000	6	60	11.5	36.6	0.773	46.4	0.1100	0.6598	5.3	4.3	1.85	34.9	6.6
T076	500	3	60	12.0	30.0	0.528	31.7	0.0714	0.2143	4.0	3.9	1.97	28.7	4.3
T077	500	3	60	11.3	22.0	0.263	15.8	0.0396	0.1187	5.3	2.4	1.06	10.9	2.4
T078	500	1	20	9.0	21.3	0.195	3.9	0.0356	0.0356	5.0	3.8	1.70	9.1	0.7
T079	1,000	2	20	11.3	16.0	0.133	2.7	0.0205	0.0409	3.8	2.9	1.46	5.3	0.4
T080	500	5	100	10.3	13.9	0.089	8.9	0.0159	0.0793	2.2	2.7	1.88	22.9	1.6
T081	500	2	40	9.0	12.7	0.067	2.7	0.0134	0.0267	3.3	2.0	1.17	5	0.5
T082	500	1	20	12.0	32.0	0.594	11.9	0.0804	0.0804	4.0	3.9	1.95	9.6	1.6
T083	500	2	40	10.5	20.0	0.216	8.6	0.0365	0.0729	3.5	4.3	2.22	23.2	1.5
T084	500	5	100	11.0	14.6	0.115	11.5	0.0172	0.0861	3.5	3.0	1.61	28.3	1.7
T085	500	4	80	11.8	31.6	0.594	47.5	0.0809	0.3236	4.3	4.0	1.97	40.2	6.5
T086	1,000	5	50	11.6	29.6	0.528	26.4	0.0732	0.3659	3.4	4.6	2.49	33.2	3.7
T087	500	3	60	10.7	21.0	0.239	14.3	0.0379	0.1136	3.3	2.7	1.47	13.7	2 3
T088	1,000	15	150	10.7	21.4	0.239	35.9	0.0439	0.6590	3.3	2.8	1.67	36.9	6.6
T089	500	2	40	9.5	20.7	0.217	8.7	0.0391	0.0781	3.5	3.3	1.72	13.7	1.6
T090	500	4	80	11.5	23.2	0.314	25.1	0.0440	0.1758	3.9	2.5	1.28	15.7	3.5
T091	500	2	40	11.5	32.1	0.594	23.8	0.0813	0.1626	4.5	4.4	2.09	24.3	3.3
T092	1,000	6	60	10.6	22.1	0.263	15.8	0.0405	0.2432	4.3	2.8	1.38	14.8	2.4
T093	500	5	100	11.6	28.7	0.495	49.5	0.0652	0.3261	4.5	3.7	1.73	43	6.5

Table 2 (6) Total data of all plots

Pl.	Area	n	N	H	D	v	V	$\bar{G}$	ΣG	$\overline{Cr.l}$	$\overline{Crm}$	$\bar{\alpha}$	C.d	$\bar{G}\times N$
(Middle stratum)														
T094	1,000	6	60	9.8	16.1	0.121	7.3	0.0222	0.1330	3.2	2.7	1.53	13.7	1.3
T095	500	5	100	11.2	31.9	0.545	54.5	0.0904	0.4521	3.9	4.4	2.19	60.8	9
T096	500	4	80	10.4	26.7	0.360	28.8	0.0583	0.2330	2.9	3.1	1.84	24.2	4.7
T097	500	4	80	11.3	23.7	0.314	25.1	0.0479	0.1914	3.1	2.5	1.43	15.7	3.8
T098	500	1	20	10.0	43.4	0.835	16.7	0.1479	0.1479	2.0	3.4	2.40	7.3	3
T099	1,000	1	10	10.0	43.4	0.835	8.4	0.1479	0.1479	2.0	3.4	2.40	3.6	1.5
T100	500	3	60	9.7	26.1	0.334	20.0	0.0546	0.1639	2.5	3.4	2.18	21.8	3.3
T101	500	13	260	10.2	17.6	0.157	40.8	0.0288	0.3749	2.2	2.7	1.80	59.5	7.5
T102	500	36	720	10.4	14.5	0.105	75.6	0.0194	0.6981	2.3	2.5	1.65	141.4	14
T103	500	20	400	11.0	17.7	0.172	68.8	0.0286	0.5717	1.9	2.6	1.89	84.9	11.4
T104	500	21	420	9.9	14.0	0.089	37.4	0.0166	0.3485	2.5	2.6	1.67	89.2	7
T105	500	3	60	10.3	27.1	0.360	21.6	0.0589	0.1766	3.0	4.5	2.58	38.2	3.5
T106	500	7	140	11.9	27.8	0.463	64.8	0.0645	0.4516	4.0	4.2	2.11	77.6	9
T107	1,000	5	50	11.3	27.8	0.424	21.2	0.0648	0.3241	2.4	3.2	2.08	16.1	3.2
T108	1,000	15	150	10.8	18.6	0.193	29.0	0.0287	0.4300	3.1	3.0	1.70	42.4	4.3
T109	500	1	20	12.0	17.8	0.188	3.8	0.0249	0.0249	4.0	1.2	0.60	0.9	0.5
T110	500	4	80	11.0	23.5	0.314	25.1	0.0450	0.1800	3.8	4.3	2.22	46.5	3.6
T111	500	14	280	9.3	17.1	0.124	34.7	0.0251	0.3519	4.3	2.5	1.20	55	7
T112	1,000	3	30	10.2	11.8	0.062	1.9	0.0118	0.0353	3.8	3.0	1.52	8.5	0.4

Table 2 (7) Total data of all plots

PL	Area	n	N	H	D	v	V	$\overline{G}$	ΣG	$\overline{Cr.l}$	$\overline{Crm}$	$\overline{\alpha}$	C.d	$\overline{G}\times N$
(Low stratum)														
B02	500	4	80	5.8	25.1	0.186	14.9	0.1095	0.4378	2.0	2.2	1.57	12.2	8.8
B03	1,000	16	160	5.9	10.5	0.030	4.8	0.0103	0.1645	2.0	1.6	1.13	12.9	1.6
B04	1,000	29	290	6.6	11.0	0.035	10.2	0.0113	0.3267	1.8	1.8	1.37	29.5	3.3
B05	500	6	120	6.3	7.1	0.010	1.2	0.0040	0.0240	2.0	1.4	1.03	7.4	0.5
B07	500	8	160	5.8	12.1	0.037	5.9	0.0153	0.1223	2.4	2.0	1.26	20.1	2.4
B08	1,000	22	220	6.3	9.1	0.016	3.5	0.0073	0.1596	2.5	2.4	1.54	39.8	1.6
B10	500	4	80	7.0	10.5	0.035	2.8	0.0103	0.0411	2.1	2.1	1.42	11.1	0.8
B11	1,000	26	260	6.2	10.8	0.030	7.8	0.0102	0.2651	1.5	1.7	1.42	23.6	2.7
B14	1,000	39	390	6.5	8.0	0.015	5.9	0.0055	0.2126	2.3	1.6	1.08	31.4	2.1
B15	1,000	12	120	6.3	11.6	0.037	4.4	0.0132	0.1586	0.0	2.6	0.00	25.5	1.6
T001	500	1	20	8.0	6.0	0.010	0.2	0.0028	0.0028	2.0	2.0	1.41	2.5	0.1
T003	500	5	100	7.2	11.6	0.043	4.3	0.0115	0.0575	3.6	2.0	1.04	12.6	1.2
T004	500	5	100	6.8	7.2	0.012	1.2	0.0043	0.0213	3.0	2.5	1.43	19.6	0.4
T006	500	5	100	6.6	8.0	0.015	1.5	0.0058	0.0288	3.2	1.5	0.83	7.1	0.6
T008	500	1	20	8.0	10.0	0.031	0.6	0.0079	0.0079	3.0	1.8	1.04	2	0.2
T009	500	2	40	5.0	6.0	0.006	0.2	0.0028	0.0056	2.5	1.8	1.11	4.1	0.1
T010	500	4	80	5.0	7.5	0.011	0.9	0.0049	0.0197	2.5	1.5	0.95	5.7	0.4
T012	500		0	0.0	0.0	0.000	0.0	0.0000	0.0000	0.0	0.0	0.00	0	0
T013	500	7	140	4.4	7.7	0.009	1.3	0.0049	0.0342	2.6	1.7	1.06	12.7	0.7
T014	500	6	120	5.8	8.3	0.013	1.6	0.0056	0.0336	2.2	2.1	1.45	16.6	0.7
T015	500	18	360	6.1	8.5	0.016	5.8	0.0059	0.1065	2.4	1.8	1.13	36.6	2.1
T016	500	35	700	6.2	8.7	0.016	11.2	0.0067	0.2335	2.1	1.7	1.14	63.6	4.7
T017	500	24	480	5.9	8.0	0.013	6.2	0.0054	0.1284	2.2	1.5	1.01	33.9	2.6
T018	500	9	180	6.4	7.5	0.013	2.3	0.0048	0.0431	2.4	1.7	1.07	16.3	0.9
T019	500	21	420	6.2	6.6	0.010	4.2	0.0035	0.0726	2.4	1.4	0.93	25.9	1.5
T020	500	21	420	6.2	8.0	0.013	5.5	0.0057	0.1196	1.9	1.6	1.27	33.8	2.4
T021	500	6	120	5.2	7.5	0.011	1.3	0.0046	0.0277	1.7	2.3	1.82	19.9	0.6
T023	500	10	200	6.6	11.3	0.035	7.0	0.0140	0.1396	2.4	1.9	1.29	22.7	2.8
T024	500	8	160	6.4	8.6	0.016	2.6	0.0070	0.0563	2.5	1.7	1.07	14.5	1.1
T025	500	21	420	6.3	8.1	0.013	5.5	0.0061	0.1284	1.7	1.4	1.08	25.9	2.6
T026	500	11	220	6.6	8.5	0.019	4.2	0.0065	0.0712	2.2	1.1	0.76	8.4	1.4
T027	500	3	60	5.0	7.4	0.008	0.5	0.0047	0.0140	2.3	1.5	1.00	4.2	0.3
T028	500	11	220	6.4	8.2	0.013	2.9	0.0060	0.0659	2.4	1.6	1.08	17.7	1.3
T029	500	8	160	5.5	9.3	0.016	2.6	0.0072	0.2715	1.6	1.9	1.55	18.1	1.2
T030	500	7	140	6.9	9.0	0.019	2.7	0.0071	0.0498	2.9	1.8	1.09	14.3	1
T031	500	4	80	6.8	7.6	0.015	1.2	0.0048	0.0190	2.0	1.3	0.91	4.2	0.4
T032	500	10	200	6.4	7.4	0.010	2.0	0.0046	0.0459	2.1	1.5	1.09	14.1	0.9
T033	500	36	720	6.4	8.6	0.016	11.5	0.0064	0.3299	2.6	1.6	1.01	57.9	4.6
T034	500	13	260	6.8	7.4	0.012	3.1	0.0047	0.0608	1.9	1.5	1.14	18.4	1.2
T035	500	27	540	6.1	8.0	0.013	7.0	0.0057	0.1549	2.2	1.6	1.07	43.4	3.1
T036	500	14	280	6.0	9.2	0.016	4.5	0.0071	0.0987	2.5	1.9	1.19	31.8	2
T037	500	19	380	6.2	8.9	0.016	6.1	0.0070	0.1336	1.5	1.7	1.43	34.5	2.7
T038	500	7	140	5.3	7.4	0.008	1.1	0.0046	0.0320	1.9	1.3	1.00	7.4	0.6
T039	500	30	600	6.1	9.3	0.016	9.6	0.0081	0.2428	1.7	1.6	1.23	48.3	4.9
T040	500	13	260	6.8	8.5	0.019	4.9	0.0061	0.0795	2.4	2.1	1.41	36	1.6
T041	500	15	300	6.1	10.3	0.023	6.9	0.0144	0.2161	1.8	1.6	1.19	24.1	4.3
T042	500	8	160	5.3	6.5	0.008	1.3	0.0034	0.0268	1.6	1.3	1.07	8.5	0.5
T043	500	17	340	6.0	7.9	0.013	4.4	0.0058	0.0992	1.8	1.4	1.05	20.9	2
T044	500	15	300	6.3	6.8	0.010	3.0	0.0038	0.0566	2.0	1.3	0.90	15.9	1.1

Table 2 (8) Total data of all plots

PL	Area	n	N	H	D	v	V	$\bar{G}$	ΣG	$\overline{Cr.l}$	$\overline{Crm}$	$\bar{\alpha}$	C.d	$\bar{G}\times N$
(Low stratum)														
T045	500	35	700	6.6	8.8	0.019	13.3	0.0067	0.2342	1.9	1.6	1.21	56.3	4.7
T046	500	4	80	6.5	8.0	0.015	1.2	0.0060	0.0238	2.8	1.8	1.05	8.1	0.5
T047	500	14	280	5.9	7.9	0.013	3.6	0.0053	0.0741	1.6	1.5	1.17	19.8	1.5
T048	500	8	160	6.3	9.0	0.016	2.6	0.0073	0.0585	2.1	1.5	1.07	11.3	1.2
T049	500	5	100	5.8	12.4	0.037	3.7	0.0179	0.0894	1.4	2.1	1.89	13.9	1.8
T050	500	4	80	6.5	17.1	0.097	7.8	0.0309	0.1234	2.3	2.1	1.44	11.1	2.5
T051	500	1	20	6.0	10.0	0.023	0.5	0.0079	0.0079	1.0	1.8	1.80	2	0.2
T052	500	3	60	6.0	13.1	0.045	2.7	0.0212	0.0636	2.0	1.3	0.94	3.2	1.3
T053	500	1	20	6.0	8.4	0.013	0.3	0.0056	0.0056	1.0	1.0	1.00	0.6	0.1
T054	1,000	3	30	8.0	26.2	0.267	8.0	0.0542	0.1626	3.3	3.9	2.29	14.3	1.6
T063	1,000	3	30	5.7	10.2	0.023	0.7	0.0086	0.0257	2.5	2.5	1.57	5.9	0.3
T064	1,000	1	10	6.0	8.0	0.013	0.1	0.0050	0.0050	3.0	2.8	1.62	2.5	0.1
T065	1,000	2	20	5.8	8.3	0.013	0.3	0.0054	0.0108	2.5	1.2	0.76	0.9	0.1
T066	1,000		0	0.0	0.0	0.000	0.0	0.0000	0.0000	0.0	0.0	0.00	0	0
T067	1,000	4	40	6.6	14.2	0.062	2.5	0.0170	0.0678	3.4	2.4	1.33	7.2	0.7
T068	1,000	6	60	5.7	20.4	0.118	7.1	0.0446	0.2675	2.1	2.1	1.37	8.3	2.7
T069	1,000	7	70	5.7	11.3	0.030	2.1	0.0106	0.0740	2.6	2.1	1.27	9.7	0.7
T070	1,000	5	50	6.2	10.3	0.023	1.2	0.0088	0.0439	2.2	1.6	1.10	4	0.4
T071	1,000	5	50	4.6	10.0	0.019	1.0	0.0083	0.0413	1.6	1.4	1.09	3.1	0.4
T072	1,000	13	130	5.2	9.8	0.019	2.5	0.0086	0.1114	2.2	1.8	1.25	13.2	1.1
T073	1,000	11	110	5.3	10.3	0.019	2.1	0.0094	0.1034	2.4	2.2	1.46	16.7	1
T074	500	6	120	5.2	6.5	0.008	1.0	0.0033	0.0199	1.8	1.5	1.10	8.5	0.4
T075	1,000	2	20	5.5	14.5	0.063	1.3	0.0212	0.0423	2.3	1.7	1.08	1.8	0.4
T076	500	3	60	6.0	7.0	0.010	0.6	0.0039	0.0116	2.3	1.0	0.69	1.9	0.2
T077	500	5	100	6.2	8.6	0.016	1.6	0.0060	0.0299	2.9	1.7	1.05	9.1	0.6
T078	500	9	180	4.8	9.7	0.019	3.4	0.0091	0.0818	2.4	2.6	1.67	38.2	1.6
T079	1,000	12	120	5.8	8.2	0.013	1.6	0.0056	0.0668	1.8	1.7	1.41	10.9	0.7
T080	500	8	160	7.1	9.1	0.019	3.0	0.0069	0.0553	2.3	1.9	1.31	18.1	1.1
T081	500	6	120	6.3	10.5	0.030	3.6	0.0094	0.0562	1.8	2.8	2.06	29.6	1.1
T082	500	5	100	4.7	7.6	0.011	1.1	0.0047	0.0237	1.4	1.6	1.53	8	0.5
T083	500	6	120	6.5	8.9	0.019	2.3	0.0072	0.0431	2.5	2.4	1.61	21.7	0.9
T084	500	6	120	6.3	7.5	0.013	1.6	0.0045	0.0270	2.3	1.6	1.08	9.7	0.5
T085	500	10	200	5.5	8.4	0.013	2.6	0.0058	0.0583	2.2	2.5	1.68	39.3	1.2
T086	1,000	1	10	5.0	9.2	0.014	0.1	0.0066	0.0000	2.0	3.6	2.55	4.1	0.1
T087	500	4	80	7.3	10.6	0.035	2.8	0.0093	0.0370	2.5	2.4	1.49	14.5	0.7
T088	1,000	7	70	6.9	13.4	0.052	3.6	0.0153	0.1072	2.3	2.7	1.79	16	1.1
T089	500		0	0.0	0.0	0.000	0.0	0.0000	0.0000	0.0	0.0	0.00	0	0
T090	500	1	20	5.0	6.0	0.006	0.1	0.0028	0.0028	2.0	1.3	0.92	1.1	0.1
T091	500	5	100	6.4	8.9	0.016	1.6	0.0083	0.0417	2.6	2.0	1.25	12.6	0.8
T092	1,000	2	20	7.0	10.7	0.035	0.7	0.0091	0.0181	2.0	1.4	0.96	1.2	0.2
T093	500	2	40	6.0	8.2	0.013	0.5	0.0054	0.0108	2.5	1.2	0.76	1.8	0.2
T094	1,000	6	60	6.4	15.8	0.073	4.4	0.0232	0.1392	2.1	2.9	2.00	15.9	1.4
T095	500	5	100	5.9	7.3	0.010	1.0	0.0042	0.0210	1.4	2.0	1.77	12.6	0.4
T096	500	2	40	6.8	14.0	0.062	2.5	0.0179	0.0357	1.0	1.8	1.92	4.1	0.7
T097	500	5	100	5.7	6.8	0.010	1.0	0.0036	0.0182	1.6	2.2	1.74	15.2	0.4
T098	500	8	160	5.8	8.4	0.013	2.1	0.0070	0.0556	1.2	2.2	1.98	24.3	1.1
T099	1,000	8	80	5.8	8.4	0.013	1.0	0.0070	0.0556	1.2	2.2	1.98	12.2	0.6
T100	500	12	240	5.9	20.2	0.118	28.3	0.0566	0.6795	2.5	3.1	2.08	72.5	13.6
T101	500	17	340	6.5	7.3	0.012	4.1	0.0042	0.0720	1.3	1.7	1.52	30.9	1.4

Table 2 (9) Total data of all plots

PL	Area	n	N	H	D	v	V	$\bar{G}$	ΣG	$\overline{Cr. l}$	$\overline{Cm}$	$\bar{\alpha}$	C.d	$\bar{G}$×N
(Low stratum)														
T102	500	15	300	7.3	7.5	0.015	4.5	0.0046	0.0648	1.8	1.6	1.20	24.1	1.4
T103	500	15	300	6.3	8.7	0.016	4.8	0.0064	0.0959	1.0	1.5	1.55	21.2	1.9
T104	500	12	240	6.4	9.0	0.016	3.8	0.0072	0.0861	1.6	2.2	1.71	36.5	1.7
T105	500	4	80	7.4	13.0	0.052	4.2	0.0136	0.0543	2.3	2.8	1.84	19.7	1.1
T106	500	9	180	6.9	10.9	0.035	6.3	0.0100	0.0697	2.1	2.3	1.58	29.9	1.8
T107	1,000	5	50	6.7	11.1	0.035	1.8	0.0100	0.0501	1.5	1.5	1.24	3.5	0.5
T108	1,000	7	70	6.4	9.7	0.023	1.6	0.0095	0.0662	1.6	2.0	1.61	8.8	0.7
T109	500	1	20	7.0	7.2	0.012	0.2	0.0041	0.0041	1.0	1.2	1.20	0.9	0.1
T110	500	3	60	6.7	11.4	0.035	2.1	0.0115	0.0344	1.7	2.0	1.61	7.5	0.7
T111	500	17	340	5.8	10.3	0.023	7.8	0.0093	0.1575	2.2	1.4	0.97	20.9	3.2
T112	1,000	8	80	6.6	7.2	0.012	1.0	0.0042	0.0332	2.8	2.2	1.37	12.2	0.3

Table 3 (1) Total data of all plots (Mukusi)

PL	Area	n	N	H	D	v	V	$\overline{G}$	ΣG	$\overline{Cr.l}$	$\overline{Crm}$	$\overline{\alpha}$	C.d	$\overline{G}$×N
(High stratum)														
B02	500	1	20	16.0	52.0	1.828	36.6	0.2124	0.2124	5.0	5.5	2.46	19	4.2
B03	1,000	6	60	15.2	47.7	1.504	90.2	0.1829	1.0976	4.8	6.2	2.81	72.5	11
B04	1,000	2	20	14.0	41.0	1.078	21.6	0.1321	0.2642	6.0	5.9	2.41	21.9	2.6
B05	500	2	40	18.0	43.0	1.503	60.1	0.1472	0.2944	6.5	5.7	2.25	40.8	5.9
B07	500	1	20	13.0	47.5	1.303	26.1	0.1772	0.1772	5.0	3.5	1.57	7.7	3.5
B08	1,000	23	230	15.3	30.7	0.701	161.2	0.0830	1.9096	5.2	4.5	1.97	146.3	19.1
B10	500	12	240	14.7	37.8	1.012	242.9	0.1205	1.4457	4.3	4.7	2.30	166.6	28.9
B11	1,000	2	20	12.8	28.0	0.501	10.0	0.0666	0.1332	3.5	3.0	1.59	5.7	1.3
B14	1,000	12	120	13.6	24.3	0.399	47.9	0.0479	0.5753	5.5	3.0	1.27	33.9	5.7
B15	1,000	15	150	14.5	39.7	1.106	165.9	0.1284	1.9254	0.0	5.4	0.00	137.4	19.3
T001	500	8	160	15.9	40.3	1.180	188.8	0.1368	1.0942	5.3	4.7	2.05	111	21.9
T002	500	6	120	13.3	31.0	0.607	72.8	0.0832	0.4992	5.3	4.3	1.88	69.7	10
T003	500	10	200	14.8	38.7	1.059	211.8	0.1238	1.2382	5.3	4.4	1.94	121.6	24.8
T004	500	4	80	14.0	38.5	0.988	79.0	0.1187	0.4747	5.3	5.4	2.37	73.3	9.5
T005	500	2	40	13.5	40.0	1.033	41.3	0.1270	0.2539	5.0	4.9	2.19	30.2	5.1
T006	500	2	40	14.5	57.0	1.987	79.5	0.2898	0.5796	6.0	6.3	2.55	49.9	11.6
T007	500	7	140	13.7	33.7	0.775	108.5	0.0931	0.6517	5.3	5.2	2.23	118.9	13
T008	500	11	220	14.0	30.5	0.654	143.9	0.0793	0.8721	5.4	3.9	1.69	105.1	17.4
T009	500	3	60	14.0	46.5	1.355	81.3	0.1991	0.5973	5.3	5.6	2.44	59.1	11.9
T010	500	3	60	15.0	71.9	2.883	173.0	0.4126	1.2378	6.3	6.6	2.63	82.1	24.8
T011	500	7	140	15.1	49.3	1.556	217.8	0.1985	1.3892	4.9	6.6	2.99	191.6	27.8
T012	500	9	180	17.4	37.1	1.095	197.1	0.1205	1.0848	5.8	4.3	1.80	104.6	21.7
T013	500	8	160	13.3	23.4	0.340	54.4	0.0457	0.3654	4.1	3.4	1.66	58.1	7.3
T014	500	2	40	13.5	33.0	0.734	29.4	0.0894	0.1788	4.5	4.9	2.33	30.2	3.6
T015	500	8	160	13.9	16.9	0.194	31.0	0.0236	0.1888	5.4	3.5	1.50	61.6	3.8
T016	500	1	20	13.0	41.9	1.043	20.9	0.1382	0.1382	4.0	6.0	3.00	22.6	2.8
T017	500	2	40	13.0	28.0	0.501	20.0	0.0697	0.1393	4.0	3.9	1.93	19.1	2.8
T018	500	11	220	13.3	18.8	0.229	50.4	0.0307	0.3379	4.7	3.2	1.49	70.8	6.8
T019	500	10	200	13.4	23.0	0.340	68.0	0.0528	0.5283	5.1	3.6	1.57	81.4	10.6
T020	500	8	160	13.9	24.4	0.399	63.8	0.0548	0.4385	4.1	3.9	1.93	76.5	8.8
T021	500	6	120	13.8	33.3	0.734	88.1	0.0923	0.5536	4.5	4.9	2.30	90.5	11.1
T022	500	7	140	13.9	32.6	0.734	102.8	0.0913	0.6390	5.0	4.6	2.01	93.1	12.8
T023	500	10	200	13.9	31.0	0.654	130.8	0.0773	0.7732	4.1	5.1	2.53	163.4	15.5
T024	500	6	120	14.0	36.0	0.859	103.1	0.1052	0.6309	5.2	4.7	2.06	83.3	12.6
T025	500	4	80	13.8	35.8	0.859	68.7	0.1205	0.4820	4.3	5.1	2.43	65.4	9.6
T026	500	12	240	14.0	22.4	0.335	80.4	0.0444	0.5328	4.4	2.8	1.30	59.1	10.7
T027	500	2	40	15.0	48.2	1.504	60.2	0.1869	0.3738	5.5	6.9	2.95	59.8	7.5
T028	500	6	120	13.7	26.5	0.503	60.4	0.0624	0.3741	4.7	3.4	1.57	43.6	7.5
T029	500	1	20	15.0	44.0	1.302	26.0	0.1521	0.1521	7.0	5.8	2.19	21.1	3
T030	500	2	40	14.5	37.9	1.012	40.5	0.1178	0.2356	5.5	5.2	2.20	34	4.7
T031	500	9	180	13.4	35.8	0.798	143.6	0.1055	0.9491	4.3	5.4	2.65	164.9	19
T032	500	7	140	14.0	36.3	0.859	120.3	0.1108	0.7757	5.1	4.6	2.04	93.1	15.5
T033	500	3	60	13.7	30.0	0.616	37.0	0.0732	0.2195	4.7	5.1	2.35	49	4.4
T034	500	5	100	13.0	17.1	0.180	18.0	0.0235	0.1174	3.8	2.5	1.26	19.6	2.4
T035	500	2	40	13.5	48.1	1.403	56.1	0.1829	0.3657	4.0	7.5	3.91	70.7	7.3
T037	500	1	20	13.0	42.0	1.043	20.9	0.1385	0.1385	5.0	4.3	1.92	11.6	2.8
T038	500	18	360	14.6	26.2	0.501	180.4	0.0575	1.0348	4.5	3.6	1.71	146.6	20.7
T040	500	4	80	13.5	26.0	0.468	37.4	0.0564	0.2256	4.0	3.9	1.95	38.2	4.5
T041	500	5	100	14.0	31.8	0.694	69.4	0.0848	0.4240	4.0	4.1	2.07	52.8	8.5

Table 3 (2) Total data of all plots (Mukusi)

PL	Area	n	N	H	D	v	V	$\bar{G}$	ΣG	$\overline{Cr.l}$	$\overline{Crm}$	$\bar{\alpha}$	C.d	$\bar{G}$×N
(High stratum)														
T042	500	9	180	14.0	27.1	0.503	90.5	0.0606	0.5454	4.6	4.5	2.08	114.5	10.9
T043	500	5	100	13.6	30.4	0.616	61.6	0.0750	0.3751	3.8	4.8	2.46	72.4	7.5
T044	500	7	140	13.4	26.4	0.434	60.8	0.0566	0.3964	5.0	4.4	1.98	85.1	7.9
T046	500	15	300	15.4	31.7	0.743	222.9	0.0809	1.2128	4.9	3.4	1.54	109	24.3
T047	500	4	80	14.3	35.5	0.859	68.7	0.0994	0.3977	4.0	6.0	3.02	90.5	8
T048	500	3	60	15.7	32.7	0.839	50.3	0.0841	0.2523	5.0	3.2	1.42	19.3	5
T049	500	2	40	14.0	31.0	0.654	26.2	0.0819	0.1637	4.5	3.7	1.75	17.2	3.3
T050	500	6	120	14.2	24.7	0.433	52.0	0.0490	0.2940	3.8	3.0	1.56	33.9	5.9
T051	500	4	80	14.3	28.5	0.577	46.2	0.0697	0.2786	3.5	3.7	1.99	34.4	5.6
T052	500	3	60	17.7	39.3	1.271	76.3	0.1367	0.4100	5.0	4.3	1.93	34.9	8.2
T053	500	1	20	14.0	40.0	1.033	20.7	0.1257	0.1257	4.0	6.0	3.00	22.6	2.5
T054	1,000	5	50	14.8	50.6	1.661	83.1	0.2100	1.0500	4.8	6.1	2.83	58.4	10.5
T055	1,000	5	50	14.8	51.0	1.661	83.1	0.2107	1.0533	6.0	5.3	2.16	44.1	10.5
T056	1,000	1	10	15.0	52.3	1.714	17.1	0.2148	0.2148	7.0	5.5	2.08	9.5	2.1
T057	1,000	2	20	14.0	49.2	1.452	29.0	0.1965	0.3929	6.0	5.5	2.25	19	3.9
T058	1,000	4	40	14.4	43.8	1.216	48.6	0.1548	0.6190	7.1	5.6	2.09	39.4	6.2
T059	1,000	3	30	13.8	55.9	1.803	54.1	0.2468	0.7404	8.2	6.1	2.14	35.1	7.4
T060	1,000	3	30	16.8	62.0	2.571	77.1	0.3030	0.5669	9.2	6.7	2.24	41.3	9.1
T061	1,000	6	60	13.1	45.4	1.172	70.3	0.1645	0.9868	5.2	4.4	1.93	36.5	9.9
T062	1,000	4	40	15.3	57.8	2.041	81.6	0.2653	1.0610	7.4	5.9	2.19	43.7	10.6
T063	1,000	6	60	14.2	43.8	1.216	73.0	0.1596	0.9577	5.1	5.5	2.39	57	9.6
T064	1,000	3	30	13.5	36.8	0.902	27.1	0.1089	0.6534	6.1	4.2	1.68	16.6	3.3
T065	1,000	4	40	15.4	43.3	1.253	50.1	0.1663	0.6653	5.0	4.7	2.07	27.8	6.7
T066	1,000	11	110	14.1	31.6	0.694	76.3	0.0808	0.8891	5.6	4.3	1.79	63.9	8.9
T067	1,000	1	10	18.0	55.0	2.249	22.5	0.2376	0.2376	8.0	6.4	2.26	12.9	2.4
T068	1,000	2	20	15.0	52.0	1.714	34.3	0.2237	0.4474	6.5	6.8	2.66	29.1	4.5
T069	1,000	10	100	15.8	37.4	1.030	103.0	0.1250	1.6250	6.2	4.0	1.57	50.3	12.5
T070	1,000	2	20	14.0	47.0	1.355	27.1	0.1738	0.3476	6.5	6.2	2.43	24.2	3.5
T071	1,000	4	40	14.9	48.4	1.504	60.2	0.1907	0.7628	6.5	6.5	2.51	53.1	7.6
T072	1,000	2	20	16.5	49.3	1.763	35.3	0.1914	0.3827	6.0	7.2	2.90	32.6	3.8
T073	1,000	5	50	15.5	58.5	2.240	112.0	0.2957	1.4783	7.0	6.5	2.43	66.4	14.8
T074	500	10	200	13.8	33.5	0.775	155.0	0.1012	1.0124	5.0	4.2	1.88	110.8	20.2
T075	1,000	3	30	14.3	35.1	0.816	24.5	0.1010	0.3029	5.7	4.0	1.73	15.1	3
T076	500	4	80	13.5	33.3	0.734	58.7	0.1003	0.4010	5.0	4.8	2.09	57.9	8
T077	500	9	180	14.4	30.1	0.616	110.9	0.0815	0.7335	5.9	4.0	1.67	90.5	14.7
T078	500	5	100	16.0	42.0	1.283	128.3	0.1397	0.6983	5.6	5.9	2.51	109.4	14
T079	1,000	5	50	16.5	51.4	1.882	94.1	0.2167	1.0833	6.2	5.5	2.18	47.5	10.8
T080	500	8	160	15.8	33.8	0.886	141.8	0.0958	0.7664	4.8	3.7	1.69	68.8	15.3
T081	500	10	200	16.0	36.5	1.030	206.0	0.1173	1.1727	4.9	3.9	1.80	95.6	23.5
T082	500	7	140	15.2	34.7	0.875	122.5	0.1015	0.7106	5.5	4.7	2.01	97.2	14.2
T083	500	13	260	15.8	44.0	1.389	361.1	0.1695	2.2040	6.3	6.5	2.58	345.1	44.1
T084	500	10	200	15.6	31.8	0.793	158.6	0.0955	0.9547	5.6	4.7	1.94	138.8	19.1
T085	500	5	100	14.2	36.2	0.859	85.9	0.1048	0.5239	5.4	4.5	1.93	63.6	10.5
T086	1,000	6	60	14.8	40.6	1.155	69.3	0.1330	0.7977	5.7	5.2	2.19	51	8
T087	500	13	260	14.0	34.6	0.816	212.2	0.0997	1.2961	4.5	3.3	1.56	89	25.9
T088	1,000	13	130	13.6	36.8	0.902	117.3	0.1211	1.5748	4.2	4.0	1.96	65.3	15.7
T089	500	8	160	14.3	39.8	1.033	165.3	0.1318	1.5184	5.7	5.3	2.21	141.2	21.1
T090	500	10	200	13.7	37.8	0.945	189.0	0.1158	1.6858	5.4	4.0	1.72	100.5	23.2
T091	500	10	200	14.4	35.8	0.859	171.8	0.1020	1.0200	5.8	4.2	1.74	110.8	20.4

Table 3 (3) Total data of all plots (Mukusi)

PL	Area	n	N	H	D	v	V	$\overline{G}$	ΣG	$\overline{Cr.i}$	$\overline{Crm}$	$\overline{\alpha}$	C.d	$\overline{G}$×N
(High stratum)														
T092	1,000	10	100	13.9	36.2	0.859	85.9	0.1124	1.1238	5.8	4.2	1.75	55.4	11.2
T093	500	7	140	14.9	45.8	1.401	196.1	0.1706	1.1945	6.1	5.0	2.01	110	23.9
T094	1,000	3	30	15.8	43.6	1.389	41.7	0.1520	0.4561	5.7	5.7	2.39	30.6	4.6
T095	500	7	140	14.3	32.2	0.694	97.2	0.0843	0.5902	4.4	4.4	2.13	85.1	11.8
T096	500	8	160	14.9	34.3	0.831	133.0	0.1009	0.8074	3.5	4.5	2.44	101.8	16.1
T097	500	8	160	13.7	30.2	0.616	98.6	0.0856	0.6848	3.6	4.3	2.26	92.9	13.7
T098	500	10	200	15.1	39.0	1.059	211.8	0.1342	1.3420	3.4	4.9	2.67	150.9	26.8
T099	1,000	10	100	15.1	39.0	1.059	105.9	0.1342	1.3420	3.4	4.9	2.67	75.4	13.4
T100	500	9	180	15.4	30.9	0.701	126.2	0.0790	0.7112	3.7	3.7	1.96	77.4	14.2
T101	500	6	120	13.2	29.2	0.536	64.3	0.0709	0.4252	3.3	3.7	2.02	51.6	8.5
T102	500	2	40	13.0	24.0	0.371	14.8	0.0452	0.0904	2.5	3.2	2.09	12.9	1.8
T103	500	1	20	14.0	25.8	0.468	9.4	0.0523	0.0523	2.5	2.6	1.64	4.2	1
T104	500	1	20	13.0	28.0	0.501	10.0	0.0616	0.0616	4.0	4.8	2.40	14.5	1.2
T105	500	4	80	14.1	40.5	1.078	86.2	0.1328	0.5310	4.0	4.6	2.30	53.2	10.6
T106	500	2	40	15.0	52.4	1.714	68.6	0.2487	0.4974	5.5	7.4	3.20	68.8	9.9
T107	1,000	3	30	16.7	45.4	1.533	46.0	0.1633	0.4899	5.7	4.0	1.72	15.1	4.9
T108	1,000	15	150	14.1	31.9	0.694	104.1	0.0818	1.2269	4.2	4.2	2.09	83.1	12.3
T109	500	9	180	14.5	28.8	0.618	111.2	0.0678	0.6104	3.1	3.8	2.15	81.7	12.2
T110	500	8	160	14.5	36.8	0.966	154.6	0.1093	0.8744	4.6	4.7	2.21	111	17.5
T112	1,000	16	160	17.0	35.5	1.043	166.9	0.1052	1.6829	5.8	4.9	2.03	120.7	16.8

Table 3 (4) Total data of all plots (Mukusi)

PL	Area	n	N	H	D	v	V	$\bar{G}$	ΣG	$\overline{Cr.l}$	$\overline{Crm}$	$\bar{\alpha}$	C.d	$\bar{G}$×N
(Middle stratum)														
B04	1,000	3	30	10.7	22.3	0.263	7.9	0.0399	0.1196	3.7	2.8	1.46	7.4	1.2
B07	500	1	20	12.0	35.1	0.700	14.0	0.0970	0.0970	6.0	3.9	1.59	9.6	1.9
B08	1,000	11	110	10.7	17.5	0.172	18.9	0.0308	0.3393	3.6	2.9	1.50	29.1	3.4
B10	500	2	40	12.0	21.5	0.287	11.5	0.0397	0.0793	4.0	2.4	1.19	7.2	1.6
B11	1,000	23	230	10.5	20.6	0.239	55.0	0.0352	0.8086	3.0	2.9	1.72	60.8	8.1
B14	1,000	39	390	10.3	14.2	0.089	34.7	0.0175	0.6840	3.6	2.1	1.12	54	6.8
B15	1,000	4	40	11.3	23.0	0.288	11.5	0.0419	0.1677	0.0	4.9	0.00	30.2	1.7
T001	500	2	40	10.0	23.0	0.262	10.5	0.0511	0.1021	3.5	3.1	1.67	12.1	2
T002	500	4	80	11.0	14.5	0.115	9.2	0.0171	0.0682	4.0	2.7	1.39	18.3	1.4
T003	500	2	40	10.5	17.0	0.152	6.1	0.0228	0.0455	4.0	2.2	1.08	6.1	0.9
T005	500	3	60	12.0	26.0	0.401	24.1	0.0550	0.1649	4.7	3.9	1.83	28.7	3.3
T006	500	1	20	11.0	18.0	0.172	3.4	0.0254	0.0254	5.0	2.8	1.25	4.9	0.5
T007	500	1	20	12.0	22.0	0.287	5.7	0.0380	0.0380	4.0	3.3	1.65	6.8	0.8
T008	500	7	140	11.3	19.4	0.193	27.0	0.0323	0.2262	3.6	2.3	1.16	23.3	4.5
T009	500	2	40	10.0	23.0	0.262	10.5	0.0423	0.0845	4.0	2.4	1.26	7.2	1.7
T010	500	2	40	12.0	28.0	0.463	18.5	0.0628	0.1256	5.5	3.8	1.62	18.1	2.5
T011	500	2	40	11.0	30.0	0.484	19.4	0.0735	0.1470	4.0	5.2	2.63	34	2.9
T013	500	18	360	11.4	16.1	0.133	47.9	0.0217	0.3904	3.3	2.1	1.16	49.9	7.8
T014	500	2	40	11.0	14.0	0.098	3.9	0.0154	0.0308	5.0	2.9	1.30	10.6	0.6
T015	500	7	140	11.1	16.9	0.152	21.3	0.0239	0.1674	5.0	3.5	1.57	53.9	3.3
T016	500	3	60	12.0	29.8	0.528	31.7	0.0853	0.2559	4.3	4.4	2.16	36.5	5.1
T017	500	9	180	11.4	21.6	0.263	47.3	0.0435	0.3918	3.7	3.5	1.77	69.3	7.8
T018	500	10	200	11.6	13.2	0.690	18.0	0.0153	0.1533	4.4	2.6	1.27	42.5	3.1
T019	500	14	280	11.0	11.6	0.068	19.0	0.0116	0.2191	3.8	1.9	0.96	31.8	3.2
T020	500	7	140	10.6	14.7	0.115	16.1	0.0253	0.1768	3.3	2.4	1.35	25.3	3.5
T021	500	3	60	12.0	18.0	0.188	11.3	0.0263	0.0788	3.3	3.2	1.73	19.3	1.6
T022	500	4	80	11.0	18.6	0.193	15.4	0.0274	0.1096	3.0	1.8	1.04	8.1	2.2
T023	500	4	80	11.8	30.0	0.528	42.2	0.0721	0.2884	3.5	5.2	2.78	68	5.8
T024	500	9	180	11.6	22.2	0.287	51.7	0.0429	0.3858	3.9	3.2	1.65	57.9	7.7
T026	500	3	60	11.3	14.0	0.098	5.9	0.0169	0.0506	3.0	1.7	0.98	5.4	1
T027	500	1	20	10.0	36.1	0.614	12.3	0.1024	0.1024	4.0	6.5	3.25	26.5	2
T028	500	3	60	11.0	15.3	0.115	6.9	0.0189	0.0568	3.7	2.4	1.29	10.9	1.1
T029	500	3	60	12.0	37.3	0.773	46.4	0.1098	0.3293	5.3	6.7	2.89	81.6	6.6
T030	500	2	40	12.0	34.0	0.665	26.6	0.0911	0.1822	5.0	3.9	1.76	19.1	3.6
T031	500	1	20	12.0	22.6	0.314	6.3	0.0402	0.0402	4.0	3.3	1.65	6.8	0.8
T033	500	4	80	12.0	26.8	0.431	34.5	0.0575	0.2299	4.0	4.2	2.08	44.3	4.6
T034	500	17	340	11.5	14.0	0.107	36.4	0.0164	0.2786	3.1	2.1	1.22	47.1	5.6
T035	500	2	40	11.5	19.0	0.211	8.4	0.0284	0.0568	4.5	3.4	1.63	14.5	1.1
T036	500	5	100	10.4	23.9	0.285	28.5	0.0529	0.2645	3.6	4.1	2.10	52.8	5.3
T037	500	8	160	11.5	23.7	0.342	54.7	0.0457	0.3653	3.5	3.9	2.10	76.5	7.3
T038	500	8	160	10.9	14.3	0.098	15.7	0.0172	0.1373	3.0	2.0	1.21	20.1	2.8
T039	500	3	60	10.7	21.5	0.263	15.8	0.0391	0.1174	3.3	2.9	1.62	15.9	2.3
T040	500	3	60	11.0	19.3	0.193	11.6	0.0336	0.1009	2.7	3.3	1.96	20.5	2
T041	500	7	140	10.9	18.7	0.193	27.0	0.0324	0.2270	2.6	2.9	1.96	37	4.5
T042	500	7	140	10.9	15.5	0.133	18.6	0.0206	0.1445	3.3	2.9	1.67	37	2.9
T043	500	9	180	10.0	18.2	0.157	28.3	0.0278	0.2499	3.2	2.8	1.61	44.3	5
T044	500	20	400	10.7	13.8	0.098	39.2	0.0175	0.3491	3.3	2.4	1.32	72.4	7
T045	500	13	260	9.6	15.5	0.121	31.5	0.0202	0.2624	2.7	2.8	1.70	64	5.3
T046	500	3	60	10.7	21.3	0.239	14.3	0.0362	0.1086	3.3	1.8	0.99	6.1	2.2

Table 3 (5) Total data of all plots (Mukusi)

PL	Area	n	N	H	D	v	V	$\bar{G}$	ΣG	$\overline{Cr.l}$	$\overline{Crm}$	$\bar{\alpha}$	C.d	$\bar{G}$×N
(Middle stratum)														
T047	500	6	120	10.5	20.4	0.216	25.9	0.0357	0.2141	2.8	3.2	1.86	38.6	4.3
T052	500	1	20	12.0	14.0	0.107	2.1	0.0154	0.0154	3.0	2.0	1.15	2.5	0.3
T053	500	2	40	12.0	21.0	0.261	10.4	0.0347	0.0694	3.5	2.6	1.37	8.5	1.4
T056	1,000	2	20	12.0	53.8	1.457	29.1	0.2309	0.4617	5.5	6.1	2.77	23.4	4.6
T057	1,000	1	10	12.0	49.5	1.286	12.9	0.1924	0.1924	3.0	5.3	3.06	8.8	1.9
T060	1,000	1	10	9.5	42.0	0.802	8.0	0.1385	0.1385	4.5	4.4	2.07	6.1	1.4
T061	1,000	2	20	11.3	38.5	0.777	15.5	0.1188	0.2376	3.5	3.6	1.89	8.1	2.4
T063	1,000	1	10	12.0	25.0	0.371	3.7	0.0491	0.0491	4.0	3.0	1.50	2.8	0.5
T064	1,000	6	60	10.3	28.2	0.385	23.1	0.0701	0.4203	4.3	3.1	1.47	18.1	4.2
T065	1,000	1	10	9.0	20.5	0.195	2.0	0.0330	0.0330	2.5	2.9	1.83	2.6	0.3
T066	1,000	3	30	11.7	29.3	0.495	14.9	0.0679	0.2038	4.7	4.8	2.24	21.7	2
T067	1,000	1	10	9.0	26.0	0.301	3.0	0.0531	0.0531	3.0	2.0	1.15	1.3	0.5
T068	1,000	1	10	11.0	33.5	0.609	6.1	0.0881	0.0881	5.0	3.5	1.57	3.8	0.9
T069	1,000	2	20	12.0	26.0	0.401	8.0	0.0534	0.1068	4.5	3.2	1.50	6.4	1.1
T070	1,000	5	50	11.2	36.8	0.708	35.4	0.1076	0.5380	5.0	6.1	2.78	58.4	5.4
T071	1,000	2	20	10.3	22.5	0.262	5.2	0.0416	0.1022	4.0	3.6	1.80	8.1	0.8
T072	1,000	3	30	11.3	28.2	0.424	12.7	0.0656	0.1969	5.8	4.5	1.84	19.1	2
T073	1,000	2	20	9.0	13.7	0.080	1.6	0.0153	0.0305	3.5	1.7	0.89	1.8	0.3
T074	500	5	100	11.1	16.1	0.133	13.3	0.0208	0.1039	3.2	2.5	1.43	19.6	2.1
T077	500	1	20	12.0	27.9	0.463	9.3	0.0613	0.0613	6.0	2.7	1.10	4.6	1.2
T079	1,000	1	10	11.5	13.5	0.107	1.1	0.0143	0.0143	3.5	2.0	1.07	1.3	0.1
T080	500	2	40	11.3	15.5	0.133	5.3	0.0199	0.0397	2.5	2.7	1.72	9.2	0.8
T081	500	1	20	8.5	15.6	0.109	2.2	0.0192	0.0192	2.5	2.5	1.58	3.9	0.4
T082	500	1	20	12.0	32.0	0.594	11.9	0.0804	0.0804	4.0	3.9	1.95	9.6	1.6
T083	500	1	20	9.0	12.0	0.056	1.1	0.0113	0.0113	3.0	2.4	1.39	3.6	0.2
T084	500	4	80	11.3	15.3	0.115	9.2	0.0187	0.0748	3.4	2.8	1.54	19.7	1.5
T085	500	2	40	12.0	26.6	0.431	17.2	0.0560	0.1120	4.5	4.4	2.11	24.3	2.2
T087	500	2	40	11.5	23.0	0.314	12.6	0.0454	0.0908	3.5	2.5	1.32	7.9	1.8
T088	1,000	5	50	11.2	28.2	0.424	21.2	0.0771	0.3857	3.2	3.3	1.81	17.1	3.9
T090	500	3	60	11.3	20.9	0.239	14.3	0.0350	0.1051	3.8	2.6	1.32	12.7	2.1
T091	500	2	40	11.5	32.1	0.594	23.8	0.0813	0.1626	4.5	4.4	2.09	24.3	3.3
T092	1,000	3	30	11.2	24.2	0.314	9.4	0.0468	0.1404	4.7	2.7	1.25	6.9	1.4
T093	500	3	60	11.7	27.9	0.463	27.8	0.0616	0.1849	4.7	3.5	1.62	23.1	3.7
T094	1,000	2	20	10.0	15.4	0.105	2.1	0.0186	0.0372	3.5	2.7	1.44	4.6	0.4
T095	500	4	80	11.5	28.4	0.463	37.0	0.0715	0.2860	3.9	4.1	2.04	42.2	5.7
T096	500	2	40	9.5	23.7	0.285	11.4	0.0452	0.0904	2.8	2.8	1.66	9.9	1.8
T097	500	2	40	11.0	21.2	0.239	9.6	0.0392	0.0783	3.5	2.1	1.15	5.5	1.6
T098	500	1	20	10.0	43.4	0.835	16.7	0.1479	0.1479	2.0	3.4	2.40	7.3	3
T099	1,000	1	10	10.0	43.4	0.835	8.4	0.1479	0.1479	2.0	3.4	2.40	3.6	1.5
T100	500	3	60	9.7	26.1	0.334	20.0	0.0546	0.1639	2.5	3.4	2.18	21.8	3.3
T101	500	11	220	10.4	16.4	0.121	26.6	0.0260	0.2855	2.4	2.7	1.75	50.4	5.7
T102	500	32	640	10.3	13.7	0.089	57.0	0.0171	0.5484	2.3	2.4	1.57	115.8	10.9
T103	500	16	320	10.9	17.3	0.152	48.6	0.0274	0.4382	1.9	2.6	1.89	68	8.8
T104	500	18	360	9.9	13.4	0.075	27.0	0.0152	0.2730	2.5	2.6	1.66	76.5	5.5
T105	500	1	20	11.0	28.5	0.453	9.1	0.0638	0.0638	3.0	4.5	2.60	12.7	1.3
T106	500	7	140	11.9	27.8	0.463	64.8	0.0645	0.4516	4.0	4.2	2.11	77.6	9
T107	1,000	3	30	11.0	28.2	0.424	12.7	0.0678	0.2033	2.7	3.2	1.97	9.7	2
T108	1,000	15	150	10.8	18.6	0.193	29.0	0.0287	0.4300	3.1	3.0	1.70	42.4	4.3
T109	500	1	20	12.0	17.8	0.188	3.8	0.0249	0.0249	4.0	1.2	0.60	0.9	0.5

Table 3 (6) Total data of all plots (Mukusi)

PL	Area	n	N	$\bar{H}$	$\bar{D}$	$\bar{v}$	V	$\bar{G}$	ΣG	$\overline{Cr.l}$	$\overline{Crm}$	$\bar{\alpha}$	C.d	$\bar{G} \times N$
(Middle stratum)														
T110	500	4	80	11.0	23.5	0.314	25.1	0.0450	0.1800	3.8	4.3	2.12	46.5	3.6
T111	500	12	240	9.4	17.0	0.124	29.8	0.0250	0.3004	4.3	2.5	1.22	47.1	6
T112	1,000	2	20	10.5	12.2	0.068	1.4	0.0128	0.0256	3.8	3.4	1.71	7.3	0.3

Table 3 (7) Total data of all plots (Mukusi)

PL	Area	n	N	H	D	v	V	$\bar{G}$	ΣG	$\overline{Cr.l}$	$\overline{Crm}$	$\bar{\alpha}$	C.d	$\bar{G}$×N
(Low stratum)														
B02	500	1	20	5.0	6.0	0.006	0.1	0.0028	0.0028	2.0	1.3	0.92	1.1	0.1
B04	1,000	1	10	8.0	8.0	0.017	0.2	0.0050	0.0050	1.0	0.8	0.80	0.2	0.1
B08	1,000	9	90	7.1	9.3	0.019	1.7	0.0081	0.0725	2.4	1.8	1.17	9.2	0.7
B10	500	1	20	8.0	10.0	0.031	0.6	0.0079	0.0079	1.0	0.5	0.50	0.2	0.2
B11	1,000	16	160	6.5	10.2	0.027	4.3	0.0086	0.1380	1.3	1.5	1.33	11.3	1.4
B14	1,000	31	310	6.7	7.6	0.015	4.7	0.0047	0.1444	2.4	1.6	1.06	24.9	1.5
B15	1,000	5	50	5.8	12.4	0.037	1.9	0.0150	0.0751	0.0	2.7	0.00	11.5	0.8
T006	500	1	20	7.0	6.0	0.009	0.2	0.0028	0.0028	4.0	1.0	0.50	0.6	0.1
T008	500	1	20	8.0	10.0	0.031	0.6	0.0079	0.0079	3.0	1.8	1.04	2	0.2
T010	500	1	20	5.0	12.0	0.031	0.6	0.0113	0.0113	2.0	1.3	0.92	1.1	0.2
T013	500	1	20	3.0	6.0	0.000	0.0	0.0028	0.0028	1.0	0.5	0.50	0.2	0.1
T014	500	1	20	7.0	8.0	0.015	0.3	0.0050	0.0050	3.0	2.8	1.62	4.9	0.1
T015	500	4	80	6.3	9.5	0.023	1.8	0.0076	0.0304	2.8	1.8	1.04	8.1	0.6
T016	500	1	20	6.0	8.0	0.013	0.3	0.0050	0.0050	2.0	1.5	1.06	1.4	0.1
T017	500	1	20	6.0	6.0	0.007	0.1	0.0028	0.0028	2.0	1.0	0.71	0.6	0.1
T018	500	2	40	8.0	6.0	0.010	0.4	0.0028	0.0056	2.5	1.1	0.66	1.5	0.1
T019	500	14	280	6.6	6.6	0.012	3.4	0.0034	0.0480	2.3	1.4	0.92	17.2	1
T020	500	11	220	6.7	9.2	0.019	4.2	0.0074	0.0816	2.2	1.6	1.16	17.7	1.6
T021	500	2	40	5.5	8.5	0.016	0.6	0.0057	0.0114	1.5	1.6	1.22	3.2	0.2
T023	500	4	80	7.3	16.0	0.085	6.8	0.0265	0.1061	2.8	2.6	1.52	17	2.1
T024	500	1	20	7.0	6.0	0.009	0.2	0.0028	0.0028	2.0	1.3	0.92	1.1	0.1
T025	500	4	80	6.3	8.0	0.013	1.0	0.0052	0.0207	2.0	1.4	1.00	4.9	0.4
T026	500	2	40	6.5	7.0	0.012	0.5	0.0039	0.0078	2.0	0.7	0.46	0.6	0.2
T028	500	1	20	7.0	16.0	0.085	1.7	0.0201	0.0201	2.0	1.3	0.92	1.1	0.4
T032	500	1	20	7.0	10.0	0.027	0.5	0.0078	0.0078	3.0	1.5	0.87	1.4	0.2
T033	500	4	80	6.5	10.4	0.027	2.2	0.0092	0.0445	3.3	1.5	0.81	5.7	0.7
T034	500	3	60	7.3	8.4	0.015	0.9	0.0059	0.0178	1.7	1.2	1.03	2.7	0.4
T035	500	2	40	6.5	8.0	0.015	0.6	0.0053	0.0106	2.0	1.5	1.06	2.8	0.2
T036	500	2	40	7.5	10.0	0.031	1.2	0.0082	0.0163	3.5	1.6	0.85	3.2	0.3
T037	500	9	180	6.3	9.1	0.016	2.9	0.0071	0.0643	1.4	1.5	1.30	12.7	1.3
T038	500	3	60	6.0	8.7	0.016	1.0	0.0062	0.0186	2.0	1.4	0.97	3.7	0.4
T039	500	5	100	7.0	12.7	0.052	5.2	0.0130	0.0651	2.2	2.2	1.52	15.2	1.3
T041	500	3	60	7.3	18.8	0.123	7.4	0.0496	0.1488	1.7	2.5	1.92	11.8	3
T042	500	2	40	6.0	6.0	0.007	0.3	0.0028	0.0056	2.0	1.2	0.82	1.8	0.1
T043	500	9	180	6.7	8.7	0.019	3.4	0.0073	0.0661	1.9	1.6	1.17	14.5	1.3
T044	500	11	220	6.6	7.1	0.012	2.6	0.0041	0.0454	2.0	1.3	0.92	11.7	0.9
T045	500	23	460	7.1	9.8	0.027	12.4	0.0080	0.1848	2.1	1.8	1.28	46.8	3.7
T049	500	1	20	7.0	6.0	0.009	0.2	0.0028	0.0028	1.0	1.0	1.00	0.6	0.1
T052	500	1	20	7.0	6.0	0.009	0.2	0.0028	0.0028	2.0	0.5	0.35	0.2	0.1
T054	1,000	1	10	8.0	24.7	0.247	2.5	0.0479	0.0479	3.0	2.3	1.33	1.7	0.5
T063	1,000	1	10	8.0	13.5	0.071	0.7	0.0143	0.0143	3.0	2.6	1.50	2.1	0.1
T069	1,000	1	10	8.0	16.0	0.097	1.0	0.0201	0.0201	2.5	1.6	1.01	0.8	0.2
T071	1,000	1	10	6.0	10.0	0.023	0.2	0.0079	0.0079	2.0	1.1	0.78	0.4	0.1
T072	1,000	1	10	5.0	13.6	0.045	0.5	0.0145	0.0145	1.0	1.9	1.90	1.1	0.1
T073	1,000	1	10	6.0	7.5	0.013	0.1	0.0044	0.0044	2.5	1.3	0.82	0.5	0
T074	500	2	40	4.8	6.8	0.008	0.3	0.0036	0.0072	1.5	1.2	0.89	1.8	0.1
T076	500	2	40	7.5	7.0	0.013	0.5	0.0039	0.0078	2.5	1.1	0.71	1.5	0.2
T077	500	2	40	8.0	9.8	0.031	1.2	0.0077	0.0153	3.5	1.3	0.70	2.1	0.3
T080	500	5	100	6.8	8.0	0.015	1.5	0.0053	0.0264	2.0	1.8	1.40	10.2	0.5

Table 3 (8) Total data of all plots (Mukusi)

PL	Area	n	N	H	D	v	V	$\overline{G}$	ΣG	$\overline{Cr.l}$	$\overline{Crm}$	$\overline{\alpha}$	C.d	$\overline{G}$×N
(Low stratum)														
T081	500	2	40	8.0	8.8	0.022	0.9	0.0061	0.0121	1.8	2.0	1.48	5	0.2
T083	500	2	40	7.5	6.0	0.010	0.4	0.0048	0.0096	3.3	1.7	0.91	3.6	0.2
T084	500	1	20	7.0	9.0	0.019	0.4	0.0064	0.0064	2.0	0.9	0.64	0.5	0.1
T087	500	2	40	7.5	10.5	0.040	1.6	0.0087	0.0174	2.0	1.7	1.17	3.6	0.3
T088	1,000	1	10	8.0	16.0	0.097	1.0	0.0201	0.0201	3.0	3.3	1.91	3.4	0.2
T091	500	1	20	5.0	19.2	0.088	1.8	0.0290	0.0290	2.0	1.9	1.34	2.3	0.6
T092	1,000	1	10	8.0	10.2	0.031	0.3	0.0082	0.0082	2.0	1.4	0.99	0.6	0.1
T096	500	1	20	7.0	19.6	0.137	2.7	0.0302	0.0302	1.5	2.1	1.71	2.8	0.6
T100	500	4	80	5.5	43.0	0.501	40.1	0.1557	0.6227	3.4	5.0	2.65	62.8	12.5
T101	500	10	200	7.0	7.1	0.012	2.4	0.0040	0.0400	1.2	1.5	1.44	14.1	0.8
T102	500	12	240	7.2	7.4	0.012	2.9	0.0045	0.0503	1.7	1.5	1.16	17	1.1
T103	500	10	200	6.8	8.1	0.015	3.0	0.0056	0.0555	1.1	1.5	1.51	14.1	1.1
T104	500	6	120	7.2	9.2	0.019	2.3	0.0070	0.0418	1.7	2.1	1.66	16.6	0.8
T106	500	4	80	8.0	9.3	0.022	1.8	0.0069	0.0137	2.0	1.8	1.31	8.1	0.6
T108	1,000	5	50	6.8	11.0	0.035	1.8	0.0119	0.0596	1.6	1.8	1.50	5.1	0.6
T110	500	3	60	6.7	11.4	0.035	2.1	0.0115	0.0344	1.7	2.0	1.61	7.5	0.7
T111	500	1	20	5.0	9.8	0.019	0.4	0.0075	0.0075	2.0	1.0	0.71	0.6	0.2
T112	1,000	4	40	6.9	7.3	0.012	0.5	0.0043	0.0173	2.9	2.2	1.29	6.1	0.2

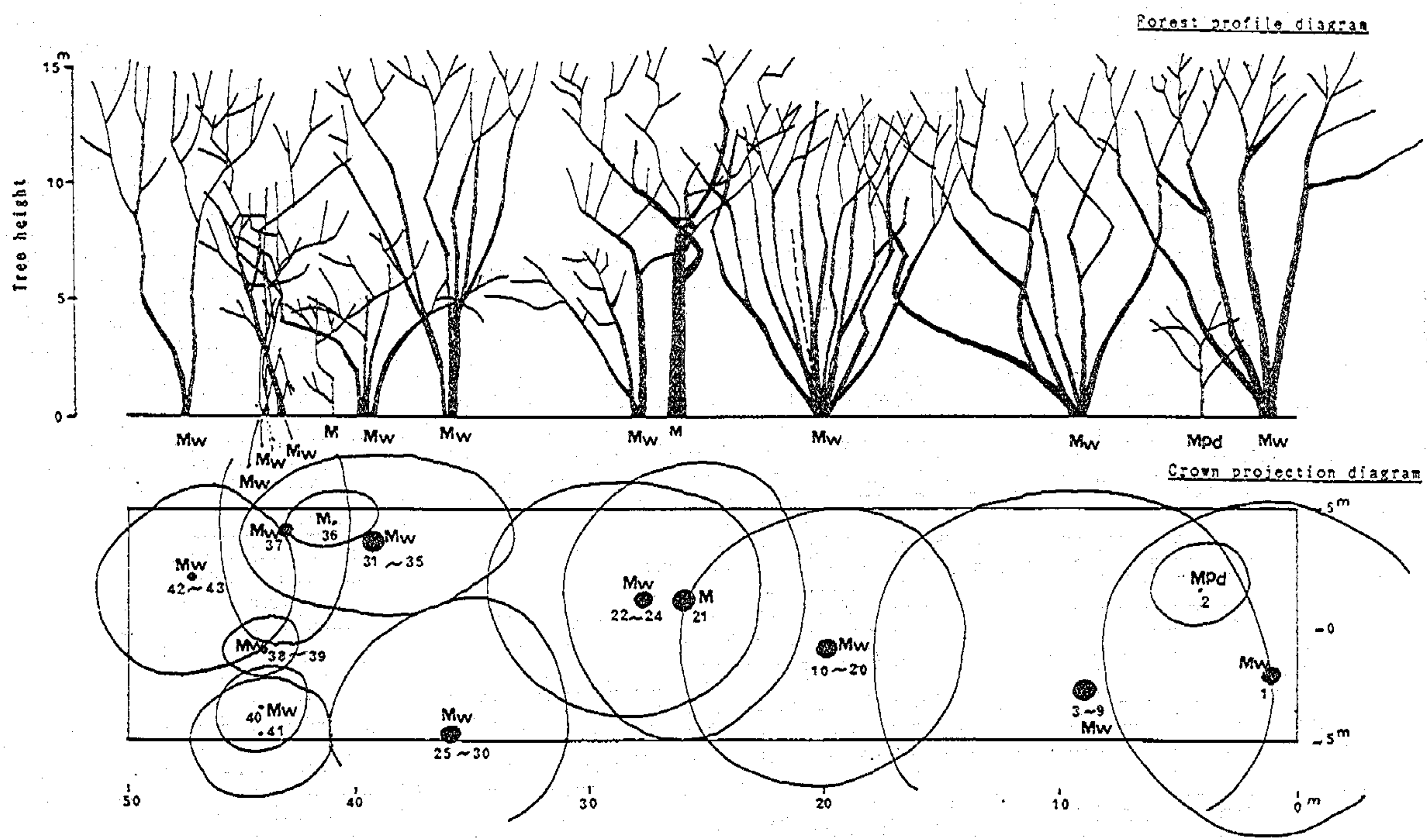


Figure 2 No. 2 Belt-transect (Lumino forest)

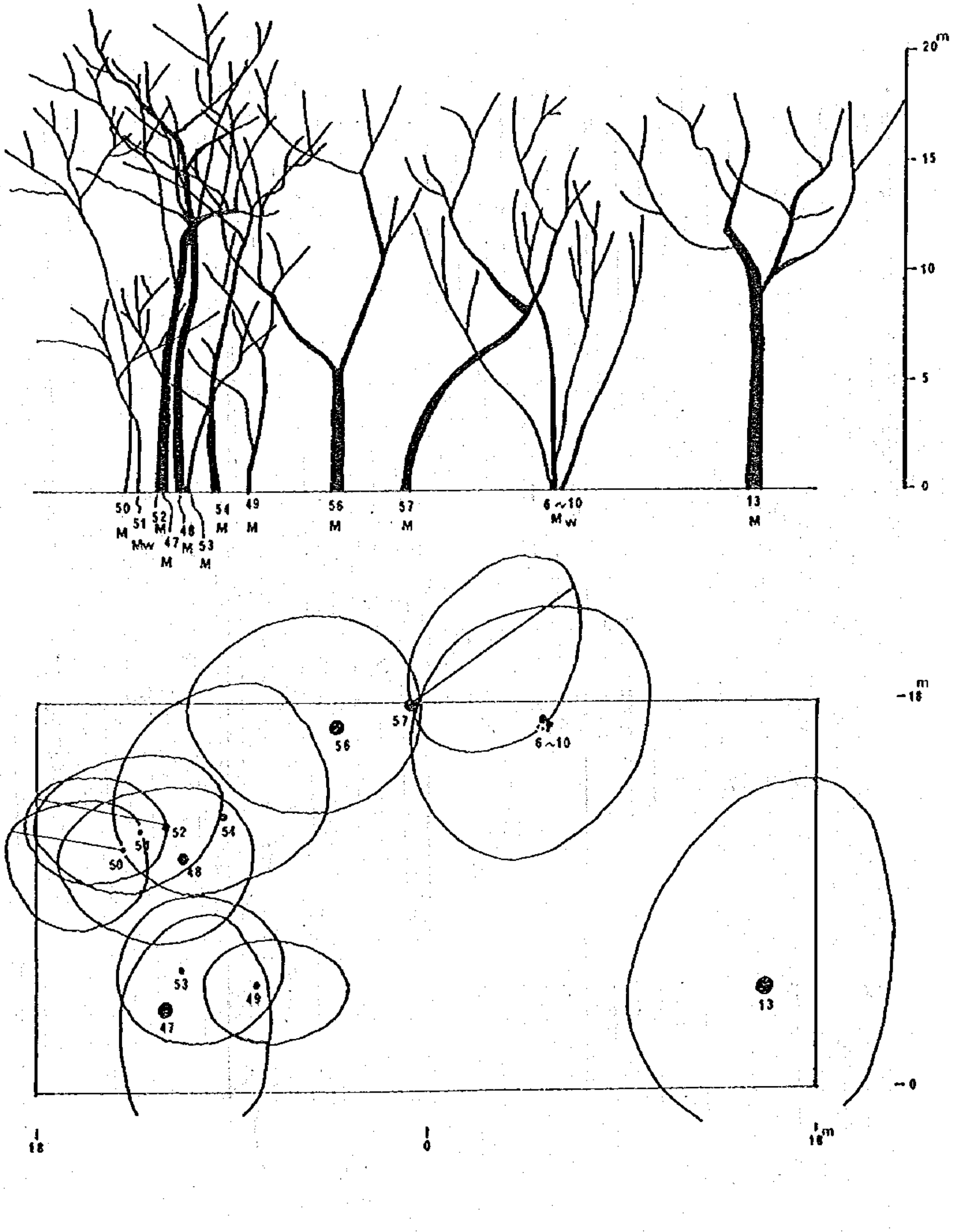


Figure 3 No. 9 Belt-transect (Sikubingwa forest)

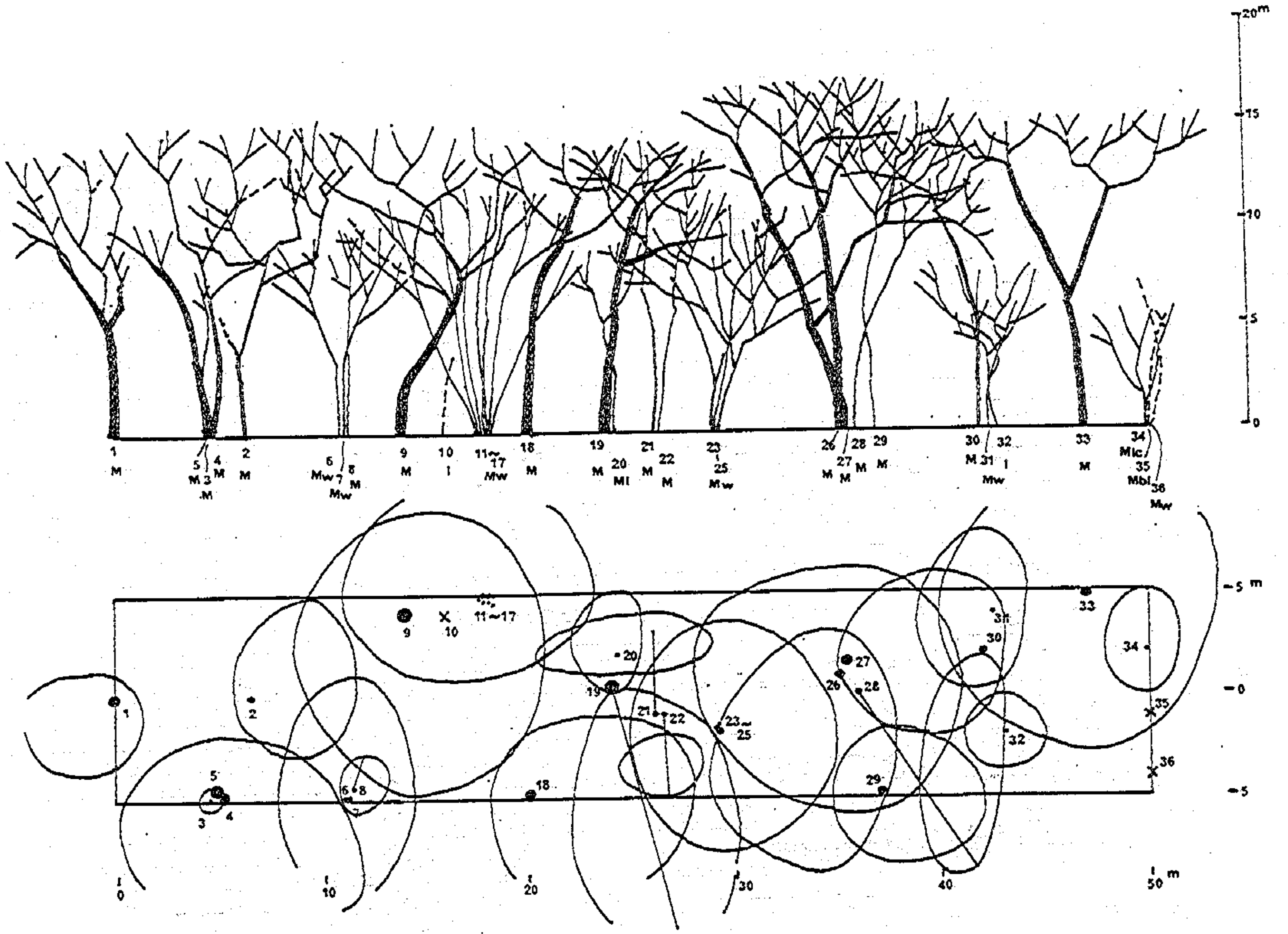


Figure 4 No. 10 Belt-transect (Sikubingwa forest)

Table 4 No. 2 Belt-transect (Lumino forest)

Species	Height m	Diameter at breast height cm	Crown Diameter m	Number
Mukusi (M)	5-16	6-52	3-11	2
Mwangula (Mw)	5-16	6-62	2.5-17	40
Mupondopondo (Mpd)	5	6	3.5	1
Total				43

Table 5 No. 9 Belt-transect (Sikubingwa forest)

Species	Height m	Diameter at breast height cm	Crown Diameter m	Number
Mukusi (m)	10-22	20-58	5.5-14.5	10
Mwangula (Mw)	9-15	8-30	6.5-11.5	6
Total				

Table 6 No. 10 Belt-transect (Sikubingwa forest)

Species	Height m	Diameter at breast height cm	Crown Diameter m	Number
Mukusi (M)	8-17	10-56	2.5-13	17
Mwangula (Mw)	10-13	7-22	6.5-10.5	14
Isunde (I)	6	8	4	2
Mwalachi (Ml)	6	6	4.5	1
Mubilo (Mbl)				1(Dead)
mukololo (Ml)	9	11	3.5	1
Total				36

2. BASIC MATERIALS FOR PREPARING VOLUME TABLES

The methods of surveying, measuring and calculating the form factor at breast height are described in detail in Sect. 2.3.3, "Preparation of Volume Table" in the Main Report. Basic materials for calculating the form factor at breast height are provided below.

The diameters measured at each height of 1 m were compiled in the survey slips, and $\overline{Dp}$ and $\overline{D20}$ were calculated. A sample of the survey slip is indicated in Table 7.

Next, the basic formula was transformed as follows so that the form factor at breast height of each tree surveyed might be calculated efficiently:

Provided that $\Delta L = 1m$,

$$f_b = \frac{(\Delta L + 0.7)\,G_{b1} + (G_{b2} + G_{b3} + \cdots + G_{bn})\,\Delta L}{G_{b1} \times H}$$

$$= \frac{(G_{b1} + G_{b2} + \cdots + G_{bn})\,\Delta L}{G_{b1} \times H} + \frac{0.7}{H}$$

$$= \frac{\pi/4\,(D_{b1}^2 + D_{b2}^2 + \cdots + D_{bn}^2)^2\,\Delta L}{\pi/4 \times D_{b1}^2 \times H} + \frac{0.7}{H}$$

Here,

$$\overline{D_p}^2 = \frac{D_{b1}^2 + D_{b2}^2 \cdots + D_{bn}^2}{H - 0.7}$$

From the above two expressions the following expression is obtained:

$$f_b = (\overline{D_p}/D_{b1})^2 \times (H - 7)/H + 0.7/H$$

The calculation result of the above expression is indicated in the Table 8 list.

The details of the trees surveyed are as follows:

Mukusi:	Photo-measured	64
	Actually measured	32
	Total	104
Mukwa:	Photo-measured	32
	Actually measured	32
	Total	64

Table 7 Example of field log and calculation for Dp and D20

Tree No.	DBH	H
3	57.8	15.7

No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Height(m)	1.2	2.2	3.2	4.2	5.2	6.2	7.2	8.2	9.2	10.2	11.2	12.2	13.2	14.2	15.2	16
Numerical value	121	116	104	100	100	100	76	40	40	24	8	38	28	20	8	
-measured							76	52	48	20	18	26	20	16	8	
(Unit 0.1 mm)								60	56	40	36	34	18	16	8	
								36	30	30	20	20	18	16	8	
										48	34	20	18	16	8	
										20	32	8	18	16	8	
										14	8	8	14	16	8	
											8	8	8	8		
												8	8	8		
												8	8	6		
													8			

41.9 Measured value for DBH 20cm

																	Total	
Number of branches	1	1	1	1	1	1	2	4	4	7	8	10	11	10	7	0		
Total	121	116	104	100	100	100	152	188	174	196	164	178	166	138	56	0	2,053	Equivalent
Gbn(photo),n=1.2.···	11,499	10,568	8,495	7,854	7,854	7,854	9,076	7,223	6,235	5,001	3,452	3,452	2,299	1,648	353			-diameter
Dbn(photo),n=1.2. ···	121.0	116.0	104.0	100.0	100.0	100.0	107.5	95.9	89.1	79.8	66.3	66.3	54.1	45.8	21.2	0.0	1,267	↓
Actual diameter(cm)	57.8	55.4	49.7	47.8	47.8	47.8	51.4	45.8	42.6	38.1	31.7	31.7	25.8	21.9	10.1	0.0	605.4	40.36
$(Dbn(photo))^2$,n=1.2···	14,641	13,456	10,816	10,000	10,000	10,000	11,556	9,197	7,939	6,368	4,396	4,396	2,927	2,098	449	0	118,238	$\overline{Dp}$=88.8 /15
													Total, up to D20→				103,973	$\overline{D20}$=102.0 /10

$G_{bn} = G_{bn1} + G_{bn2} + G_{bn3} + \cdots$

$D_{bn} = 2(G_{bn}/\pi)^{0.5}$

$\overline{Dp}^2 = (D_{b1}^2 + D_{b2}^2 + \cdots + D_{bn}^2)/(H-0.7)$

$\overline{Dp} = D_{b1}(\text{photo})$

Table 8 (1) Stem analysis by means of photograph interpretation (Mukusi) No.1

	a	b	c		d	e	f	g	h	i	j	k	l	m	n		
No.	H	H_{20}	DBH	(DBH)	Dp (Photo)	$\overline{Dp}$	$\overline{D_{20}}$	0.7/H	$\overline{(Dp/Dp)^2}$	h×(H−0.7)/H	f=g+i	$\overline{(D_{20}/Dp)^2}$	k×(H_{20}−0.7)/H	f_{20}=g+1	f_{20}/f	Remarks	Actual tree height
1	14.7	8.7	45.5	52.3	112.0	86.6	100.9	0.048	0.598	0.570	0.618	0.812	0.442	0.490	0.793	Upper:Without Bark	
			47.9	54.8	117.0				0.548	0.522	0.570	0.744	0.405	0.453	0.795	Lower:With Bark	
2	11.7	5.7	31.0	31.0	58.0	48.4	51.5	0.060	0.696	0.654	0.714	0.788	0.337	0.397	0.556		
			33.0	33.5	63.0				0.590	0.555	0.615	0.668	0.285	0.345	0.561		
3	12.7	6.7	44.5	57.1	121.0	100.6	109.3	0.055	0.691	0.653	0.708	0.816	0.386	0.441	0.623		
			46.8	59.5	126.0				0.637	0.602	0.657	0.752	0.355	0.410	0.624		
4	13.7	7.7	32.0	30.0	72.0	57.5	65.3	0.051	0.638	0.605	0.656	0.823	0.421	0.472	0.720		
			54.0	32.4	75.0				0.588	0.558	0.609	0.758	0.387	0.438	0.719		
5	16.7	11.7	40.0	36.5	73.0	52.4	54.9	0.042	0.515	0.493	0.535	0.566	0.373	0.415	0.776		
			42.2	39	78.0				0.451	0.432	0.474	0.495	0.326	0.368	0.776		
5−2	13.7	7.7	33.7	—	42.0	34.6	36.0	0.051	0.679	0.644	0.695	0.735	0.376	0.427	0.614		
			36.0		45.0				0.591	0.561	0.612	0.640	0.327	0.378	0.618		
6	10.7	3.7	24.4	22.6	43.0	36.7	40.0	0.065	0.728	0.680	0.745	0.865	0.243	0.308	0.413		
			26.6	24.5	47.0				0.610	0.570	0.635	0.724	0.203	0.268	0.422		
7	15.7	10.7	32.0	31.6	64.0	52.5	56.0	0.045	0.673	0.643	0.688	0.766	0.488	0.533	0.775		
			34.0	34.0	69.0				0.579	0.553	0.598	0.659	0.420	0.465	0.778		
8	18.7	12.7	44.0	43.9	76.0	52.9	59.7	0.037	0.484	0.466	0.503	0.617	0.396	0.433	0.861		
			46.0	46.5	81.0				0.427	0.411	0.448	0.543	0.348	0.385	0.859		
9	11.5	1.2	20.0	25.5	74.0	50.8	74.0	0.061	0.471	0.442	0.503	1.000	0.043	0.104	0.207		
			22.0	27.5	62.5	49.8	70.0		0.635	0.596	0.657	1.254	0.055	0.116	0.177		

Table 8 (2) Stem analysis by means of photograph interpretation (Mukusi)

No.2

No.	a H	b H_{20}	c DBH	(DBH)	d Dp (Photo)	e $\overline{Dp}$	f $\overline{D_{20}}$	g 0.7/H	h $(\overline{Dp}/Dp)^2$	i h×(H-0.7)/H	j f=g+i	k $(\overline{D_{20}}/Dp)^2$	l k×(H_{20}-0.7)/H	m f_{20}=g+l	n f_{20}/f	Remarks	Actual tree height
10	10.7	4.7	34.0	32.9	92.0	65.9	84.1	0.065	0.513	0.479	0.544	0.836	0.313	0.378	0.695	Upper:Without Bark	
			36.2	35.2	99.0				0.443	0.414	0.479	0.722	0.270	0.335	0.699	Lower:With Bark	
11	14.7	7.7	38.0	36.9	83.0	57.6	70.0	0.048	0.482	0.459	0.507	0.711	0.339	0.387	0.763		
			40.3	39.2	88.0				0.428	0.408	0.456	0.633	0.301	0.349	0.765		
12	9.7	3.7	22.0	20.5	62.0	54.7	59.4	0.072	0.778	0.722	0.794	0.918	0.284	0.356	0.448		
			24.0	22.5	68.0				0.647	0.600	0.672	0.763	0.236	0.308	0.458		
13	13.7	7.7	34.0	39.8	94.0	66.7	79.7	0.051	0.503	0.477	0.528	0.719	0.367	0.418	0.792		
			36.2	42.1	82.0	65.7	78.0		0.642	0.609	0.660	0.905	0.462	0.513	0.777		
14	17.7	12.7	58.0	60.6	114.0	80.7	86.5	0.040	0.501	0.481	0.521	0.576	0.391	0.431	0.827		
			60.7	63.0	119.0				0.460	0.442	0.482	0.528	0.358	0.398	0.826		
15	11.7	6.7	30.0	26.0	70.0	58.6	63.7	0.060	0.701	0.659	0.719	0.828	0.425	0.485	0.675		
			32.2	28.0	75.5				0.602	0.566	0.626	0.712	0.365	0.425	0.679		
16	14.7	8.7	48.0	46.4	90.0	70.9	83.4	0.048	0.621	0.591	0.639	0.859	0.467	0.515	0.806		
			50.4	49.0	95.0				0.557	0.530	0.578	0.771	0.420	0.468	0.810		
17	10.7	6.7	30.0	28.3	77.0	62.0	70.7	0.065	0.648	0.606	0.671	0.843	0.473	0.538	0.802		
			32.2	30.4	84.0				0.545	0.509	0.574	0.708	0.397	0.462	0.805		
18	14.7	8.7	42.0	42.2	92.0	67.9	76.2	0.048	0.545	0.519	0.567	0.686	0.373	0.421	0.743		
			47.5	44.5	97.0				0.490	0.467	0.515	0.617	0.336	0.384	0.746		
18-2	9.7	3.7	22.0	-	48.0	37.8	44.7	0.072	0.620	0.575	0.647	0.867	0.268	0.340	0.526		
			24.0		52.5				0.518	0.481	0.553	0.725	0.224	0.296	0.535		

Table 8 (3) Stem analysis by means of photograph interpretation (Mukusi)

No. 3

	a	b	c		d	e	f	g	h	i	j	k	l	m	n		
No.	H	H_{20}	DBH	(DBH)	Dp (Photo)	$\overline{Dp}$	$\overline{D_{20}}$	0.7/H	$(\overline{Dp}/Dp)^2$	h×(H-0.7)/H	f=g+i	$(\overline{D_{20}}/Dp)^2$	k×(H_{20}-0.7)/H	f_{20}=g+l	f_{20}/f	Remarks	Actual tree height
29	12.7	7.7	28.0	25.8	68.0	54.5	59.1	0.055	0.642	0.607	0.662	0.755	0.416	0.471	0.711	Upper: Without Bark	
			30.2	28	73.0				0.557	0.526	0.581	0.655	0.361	0.416	0.716	Lower: With Bark	
30	13.7	6.7	34.0	34.6	83.0	65.8	70.4	0.051	0.628	0.596	0.647	0.719	0.315	0.366	0.566		
			36.3	36.7	88.0				0.559	0.530	0.581	0.640	0.280	0.331	0.570		
31	14.7	7.7	34.0	32.9	53.0	41.5	46.8	0.048	0.613	0.584	0.632	0.780	0.371	0.419	0.663		
			36.2	35.0	58.0				0.512	0.488	0.536	0.651	0.310	0.358	0.668		
32	14.7	5.7	30.0	32.4	78.0	57.6	68.8	0.048	0.545	0.519	0.567	0.778	0.265	0.313	0.552		
			32.2	34.6	83.0				0.482	0.459	0.507	0.687	0.234	0.282	0.556		
33	16.7	8.7	38.0	38.0	70.0	50.6	57.0	0.042	0.523	0.501	0.543	0.663	0.318	0.360	0.663		
			40.4	40.2	74.0				0.468	0.448	0.490	0.593	0.284	0.326	0.665		
34	11.7	6.7	34.0	32.5	93.0	80.8	86.1	0.060	0.755	0.710	0.770	0.857	0.439	0.499	0.648		
			36.2	34.5	99.0				0.666	0.626	0.686	0.756	0.388	0.448	0.653		
35	16.7	10.7	40.0	-	69.0	52.7	56.9	0.042	0.583	0.559	0.601	0.680	0.407	0.449	0.747		
			42.0		73.0				0.521	0.499	0.541	0.608	0.364	0.406	0.750		
36	14.7	10.7	34.0	-	60.0	47.3	49.6	0.048	0.621	0.591	0.639	0.683	0.465	0.513	0.803		
			36.0		64.0				0.546	0.520	0.568	0.601	0.409	0.457	0.805		
37	12.7	8.7	40.0	37.5	63.0	47.0	53.6	0.055	0.557	0.526	0.581	0.724	0.456	0.511	0.880		
			42.4	39.5	67.0				0.492	0.465	0.520	0.640	0.403	0.458	0.881		
38	16.7	11.7	40.0	36.4	69.0	53.4	57.2	0.042	0.599	0.574	0.616	0.687	0.453	0.495	0.804		
			42.5	38.8	73.0				0.535	0.513	0.555	0.614	0.404	0.446	0.804		

Table 8 (4) Stem analysis by means of photograph interpretation (Mukusi) No. 4

	a	b	c		d	e	f	g	h	i	j	k	l	m	n		
No.	H	H_{20}	DBH	(DBH)	Dp (Photo)	$\overline{Dp}$	$\overline{D_{20}}$	0.7/H	$\overline{(Dp/Dp)^2}$	h×(H-0.7)/H	f=g+i	$\overline{(D_{20}/Dp)^2}$	k×(H_{20}-0.7)/H	f_{20}=g+l	f_{20}/f	Remarks	Actual tree height
19	14.7	8.7	34.0	32.9	73.0	57.0	61.5	0.048	0.610	0.581	0.629	0.710	0.386	0.434	0.690	Upper:Without Bark	
			30.3	35.2	78.0				0.534	0.509	0.557	0.622	0.339	0.387	0.695	Lower:With Bark	
20	13.7	7.7	32.0	30.2	68.0	50.4	59.1	0.051	0.549	0.521	0.572	0.755	0.386	0.437	0.764		
			34.0	32.5	73.0				0.477	0.453	0.504	0.655	0.335	0.386	0.766		
21	16.5	9.7	36.0	35.1	65.0	48.4	55.0	0.042	0.554	0.530	0.572	0.716	0.391	0.433	0.757		
			38.2	36.4	70.0				0.478	0.458	0.500	0.617	0.337	0.379	0.758		
22	15.7	11.7	32.0	31.3	68.0	55.2	56.6	0.045	0.659	0.630	0.675	0.693	0.486	0.531	0.787		
			34.0	33.5	73.0				0.572	0.546	0.591	0.601	0.421	0.466	0.788		
23	12.7	9.7	34.0	39.2	98.0	80.4	83.1	0.055	0.673	0.636	0.691	0.719	0.510	0.565	0.818		
			36.3	41.5	104.0				0.598	0.565	0.620	0.638	0.452	0.507	0.818		
24	10.7	6.7	32.0	32.1	87.0	73.8	77.0	0.065	0.720	0.673	0.738	0.783	0.439	0.504	0.683		
			34.4	34.5	92.0				0.643	0.601	0.666	0.700	0.393	0.458	0.688		
25	14.7	5.7	34.0	37.3	82.0	62.7	73.8	0.048	0.585	0.557	0.605	0.810	0.276	0.324	0.536		
			36.2	39.5	87.0				0.519	0.494	0.542	0.720	0.245	0.293	0.541		
26	15.7	7.7	38.0	36.5	72.0	55.9	62.1	0.045	0.603	0.576	0.621	0.744	0.332	0.377	0.607		
			40.2	38.7	77.0				0.527	0.504	0.549	0.650	0.290	0.335	0.610		
27	10.7	5.7	32.0	32.7	88.0	75.7	79.8	0.065	0.740	0.692	0.757	0.822	0.384	0.449	0.593		
			34.2	35.0	93.0				0.663	0.620	0.685	0.736	0.344	0.409	0.597		
28	11.7	5.7	28.0	27.0	73.0	57.5	68.3	0.060	0.620	0.583	0.643	0.875	0.374	0.434	0.675		
			30.2	29.2	79.0				0.530	0.498	0.558	0.747	0.319	0.379	0.679		

Table 8 (5) Stem analysis by means of photograph interpretation (Mukusi)

	a	b	c		d	e	f	g	h	i	j	k	l	m	n		
No.	H	H_{20}	DBH	(DBH)	Dp (Photo)	$\overline{Dp}$	$\overline{D_{20}}$	0.7/H	$\overline{(Dp/Dp)^2}$	h×(H-0.7)/H	f=g+i	$\overline{(D_{20}/Dp)^2}$	k×(H_{20}-0.7)/H	f_{20}=g+l	f_{20}/f	Remarks	Actual tree height
39	14.7	8.7	38.0	36.7	80.0	60.8	65.8	0.048	0.578	0.550	0.598	0.677	0.368	0.416	0.696	Upper: Without Bark	
			40.2	39.0	85.0				0.512	0.488	0.536	0.599	0.326	0.374	0.698	Lower: With Bark	
40	15.7	10.7	36.0	33.5	64.0	45.8	50.6	0.045	0.512	0.489	0.534	0.625	0.398	0.443	0.830		
			38.2	35.8	69.0				0.441	0.421	0.466	0.538	0.343	0.388	0.833		
41	14.7	9.7	32.0	33.3	72.0	57.3	64.1	0.048	0.633	0.603	0.651	0.793	0.486	0.534	0.820		
			34.0	35.9	77.0				0.554	0.528	0.576	0.693	0.424	0.472	0.819		
42	14.7	9.7	34.0	35.4	78.0	65.2	68.5	0.048	0.699	0.666	0.714	0.771	0.472	0.520	0.728		
			36.0	37.6	83.0				0.617	0.588	0.636	0.681	0.417	0.465	0.731		

Table 8 (6) Stem analysis by means of photograph interpretation (Mukusi) With Bark No. 1

	a	b	c		d	e	f	g	h	i	j	k	l	m	n		
No.	H	H_{20}	DBH	(DBH)	Dp (Photo)	$\overline{Dp}$	$\overline{D_{20}}$	0.7/H	$\overline{(Dp/Dp)^2}$	h×(H-0.7)/H	f=g+i	$\overline{(D_{20}/Dp)^2}$	k×(H_{20}-0.7)/H	f_{20}=g+l	f_{20}/f	Remarks	Actual tree height
43	21.7	10.7	69.0		115.0	68.1	92.8	0.032	0.351	0.340	0.372	0.651	0.300	0.332	0.892		22.0
44	16.7	12.7	62.5		120.0	96.4	102.3	0.042	0.645	0.618	0.660	0.727	0.522	0.564	0.855		17.0
45	15.7	10.7	57.8		121.0	88.8	102.0	0.045	0.539	0.515	0.560	0.711	0.453	0.498	0.889		16.0
46	15.7	7.7	53.0		100.0	66.6	95.2	0.045	0.444	0.424	0.469	0.906	0.404	0.449	0.957		16.0
47	17.7	13.7	66.3		98.0	76.0	78.7	0.040	0.601	0.577	0.617	0.645	0.474	0.514	0.833		18.0
48	17.7	12.7	70.0		125.0	90.7	100.2	0.040	0.526	0.505	0.545	0.643	0.436	0.476	0.873		18.0
49	15.7	8.7	48.2		87.0	56.8	73.9	0.045	0.426	0.407	0.452	0.722	0.368	0.413	0.914		16.0
50	14.7	9.7	76.6		156.0	100.3	122.9	0.048	0.413	0.393	0.441	0.621	0.380	0.428	0.971		14.5
51	14.7	7.7	71.5		154.0	90.2	126.0	0.048	0.343	0.327	0.375	0.669	0.319	0.367	0.979		15.0
52	16.7	9.7	50.4		96.0	72.6	91.0	0.042	0.572	0.548	0.590	0.899	0.484	0.526	0.892		17.0
53	15.7	9.7	50.9		113.0	74.8	93.0	0.045	0.438	0.418	0.463	0.677	0.388	0.433	0.935		15.5
54	18.7	10.7	67.1		119.0	81.9	103.1	0.037	0.474	0.456	0.493	0.751	0.402	0.439	0.890		18.5
55	16.7	11.7	63.6		118.0	84.5	97.4	0.042	0.513	0.491	0.533	0.681	0.449	0.491	0.921		17.0
56	14.7	8.7	55.6		109.0	74.8	96.6	0.048	0.471	0.449	0.497	0.785	0.427	0.475	0.956		15.0
57	17.7	9.7	51.6		95.0	66.7	87.2	0.040	0.493	0.474	0.514	0.843	0.429	0.469	0.912		17.5
58	18.7	11.7	65.0		113.0	84.1	97.7	0.037	0.554	0.533	0.570	0.748	0.440	0.477	0.837		19.0
59	15.7	12.7	70.5		125.0	100.7	103.6	0.045	0.649	0.620	0.665	0.687	0.525	0.570	0.857		16.0
60	16.7	11.7	54.1		108.0	86.1	95.5	0.042	0.636	0.609	0.651	0.782	0.515	0.557	0.856		17.0
61	14.7	9.7	73.5		143.0	111.2	136.4	0.048	0.605	0.576	0.624	0.910	0.557	0.605	0.970		15.0
62	15.7	10.7	70.7		134.0	110.8	130.8	0.045	0.684	0.654	0.699	0.953	0.607	0.652	0.933		15.5

Table 8 (7) Stem analysis by means of photograph interpretation (Mukusi) With Bark No. 2

	a	b	c		d	e	f	g	h	i	j	k	l	m	n		
No.	H	H_{20}	DBH	(DBH)	Dp (Photo)	$\overline{Dp}$	$\overline{D_{20}}$	0.7/H	$(\overline{Dp}/Dp)^2$	h×(H-0.7)/H	f=g+i	$(\overline{D_{20}}/Dp)^2$	k×(H_{20}-0.7)/H	f_{20}=g+l	f_{20}/f	Remarks	Actual tree height
63	19.7	9.7	85.0		157.0	101.5	142.6	0.036	0.418	0.403	0.439	0.825	0.377	0.413	0.941		20.0
64	19.7	13.7	111.5		177.0	128.7	143.1	0.036	0.529	0.510	0.546	0.654	0.432	0.468	0.857		20.0
65	16.7	12.7	70.0		132.0	95.5	100.7	0.042	0.523	0.501	0.543	0.582	0.418	0.460	0.847		17.0
66	17.7	11.7	61.0		127.0	80.1	92.2	0.040	0.398	0.382	0.422	0.527	0.328	0.368	0.872		17.5
67	18.7	11.7	61.0		97.0	69.4	80.9	0.037	0.512	0.493	0.530	0.696	0.409	0.446	0.842		19.0
68	20.7	13.7	68.4		119.0	80.0	89.6	0.034	0.452	0.437	0.471	0.567	0.356	0.390	0.828		21.0
69	17.7	11.7	59.2		104.0	83.5	98.5	0.040	0.645	0.619	0.659	0.897	0.557	0.597	0.906		17.5
70	17.7	11.7	58.6		109.0	77.9	92.3	0.040	0.511	0.491	0.531	0.717	0.446	0.486	0.915		18.0
71	17.7	10.7	62.4		121.0	85.1	105.7	0.040	0.495	0.475	0.515	0.763	0.431	0.471	0.915		18.0
72	20.7	15.7	67.7		90.0	70.9	72.3	0.034	0.621	0.600	0.634	0.645	0.467	0.501	0.790		20.5
73	21.7	14.7	85.2		133.0	88.3	98.1	0.032	0.441	0.427	0.459	0.544	0.351	0.383	0.834		22.0
74	20.7	14.7	94.4		134.0	90.6	99.0	0.034	0.457	0.442	0.476	0.546	0.369	0.403	0.847		21.0

Table 9 (1) Stem analysis by means of actual measurement (Mukusi) With Bark No. 1

	a	b	c		d	e	f	g	h	i	j	k	l	m	n		
No.	H	H_{20}	DBH	(DBH)	Dp (Photo)	$\overline{Dp}$	$\overline{D_{20}}$	0.7/H	$(\overline{Dp}/Dp)^2$	h×(H-0.7)/H	f=g+i	$(\overline{D_{20}}/Dp)^2$	k×(H_{20}-0.7)/H	f_{20}=g+l	f_{20}/f	Remarks	Actual tree height
75	6.7		8.4		8.4	6.7		0.104	0.636	0.570	0.674	0.000	0.000		0.000		7.0
76	8.7		12.0		12.0	9.1		0.080	0.575	0.529	0.609	0.000	0.000		0.000		8.7
77	8.7		14.5		14.5	10.4		0.080	0.514	0.473	0.553	0.000	0.000		0.000		8.5
78	8.7		15.4		15.4	11.3		0.080	0.538	0.495	0.575	0.000	0.000		0.000		8.4
79	8.7		20.2		20.2	14.4		0.080	0.508	0.467	0.547	0.000	0.000		0.000		9.0
80	8.7		15.0		15.0	12.6		0.080	0.706	0.649	0.729	0.000	0.000		0.000		9.0
81	8.7		16.4		16.4	13.4		0.080	0.668	0.614	0.694	0.000	0.000		0.000		8.8
82	9.7		18.2		18.2	14.3		0.072	0.617	0.572	0.644	0.000	0.000		0.000		10.0
83	7.7		18.4		18.4	12.2		0.091	0.440	0.400	0.491	0.000	0.000		0.000		7.8
84	8.7		12.8		12.8	9.0		0.080	0.494	0.454	0.534	0.000	0.000		0.000		8.6
85	9.7		16.6		16.6	11.3		0.072	0.463	0.430	0.502	0.000	0.000		0.000		9.6
86	9.7		19.2		19.2	13.5		0.072	0.494	0.458	0.530	0.000	0.000		0.000		9.4
87	7.7		11.2		11.2	8.7		0.091	0.603	0.548	0.639	0.000	0.000		0.000		7.4
88	5.7		9.0		9.0	7.0		0.123	0.605	0.531	0.654	0.000	0.000		0.000		6.0
89	7.7		10.2		10.2	7.6		0.091	0.555	0.505	0.596	0.000	0.000		0.000		7.8
90	7.7		10.8		10.8	8.5		0.091	0.619	0.563	0.654	0.000	0.000		0.000		8.0
91	8.7		13.4		13.4	9.9		0.080	0.546	0.502	0.582	0.000	0.000		0.000		8.5
92	7.7		16.8		16.8	13.5		0.091	0.646	0.587	0.678	0.000	0.000		0.000		8.0
93	7.7		15.2		15.2	11.8		0.091	0.603	0.548	0.639	0.000	0.000		0.000		8.0
94	6.7		11.6		11.6	9.1		0.104	0.615	0.551	0.655	0.000	0.000		0.000		7.0

Table 9 (2) Stem analysis by means of actual measurement (Mukusi) With Bark No. 2

	a	b	c		d	e	f	g	h	i	j	k	l	m	n		
No.	H	H_{70}	DBH	(DBH)	Dp (Photo)	$\overline{Dp}$	$\overline{D_{70}}$	0.7/H	$(\overline{Dp}/Dp)^2$	h×(H−0.7)/H	f=g+i	$(\overline{D_{70}}/Dp)^2$	k×(H_{70}−0.7)/H	f_{70}=g+l	f_{70}/f	Remarks	Actual tree height
95	10.7		18.2		18.2	12.6		0.065	0.479	0.448	0.513	0.000	0.000		0.000		10.5
96	7.7		17.8		17.8	14.2		0.091	0.636	0.578	0.669	0.000	0.000		0.000		8.0
97	6.7		17.2		17.2	13.9		0.104	0.653	0.585	0.689	0.000	0.000		0.000		6.8
98	7.7		24.2		24.2	17.5		0.091	0.523	0.475	0.566	0.000	0.000		0.000		7.4
99	7.7		20.2		20.2	14.1		0.091	0.487	0.443	0.534	0.000	0.000		0.000		7.6
100	7.7		18.6		18.6	12.2		0.091	0.430	0.391	0.482	0.000	0.000		0.000		7.6
101	7.7		5.8		5.8	4.9		0.091	0.714	0.649	0.740	0.000	0.000		0.000		8.0
102	9.7		11.4		11.4	9.9		0.072	0.754	0.700	0.772	0.000	0.000		0.000		9.4
103	8.7		10.4		10.4	8.2		0.080	0.622	0.572	0.652	0.000	0.000		0.000		9.0
104	8.7		12.4		12.4	9.3		0.080	0.563	0.518	0.598	0.000	0.000		0.000		9.0
105	7.7		12.4		12.4	9.4		0.091	0.575	0.523	0.614	0.000	0.000		0.000		8.2
106	10.7		19.0		19.0	13.3		0.065	0.490	0.458	0.523	0.000	0.000		0.000		10.5

Table 10 (1) Stem analysis by means of photograph interpretation (Mukwa) With Bark No. 1

	a	b	c		d	e	f	g	h	i	j	k	l	m	n		
No.	H	H_{20}	DBH	(DBH)	Dp (Photo)	$\overline{Dp}$	$\overline{D_{20}}$	0.7/H	$(\overline{Dp}/Dp)^2$	h×(H−0.7)/H	f=g+i	$(\overline{D_{20}}/Dp)^2$	k×(H_{20}−0.7)/H	f_{20}=g+l	f_{20}/f	Remarks	Actual tree height
1	11.7	6.7	30		38	27.4	32.5	0.060	0.520	0.489	0.549	0.731	0.375	0.435	0.792		11.5
2	13.7	8.7	47		56	45.4	50.7	0.051	0.657	0.623	0.674	0.820	0.479	0.530	0.786		14.0
3	10.7	2.7	22		34	24.8	33.0	0.065	0.532	0.497	0.562	0.942	0.176	0.241	0.429		10.5
4	11.7	8.7	50		54	46.6	51.4	0.060	0.745	0.700	0.760	0.906	0.619	0.679	0.893		12.0
5	13.7	9.7	60		60	44.6	51.2	0.051	0.553	0.525	0.576	0.728	0.478	0.529	0.918		13.5
6	13.7	8.7	44		53	37.5	44.0	0.051	0.501	0.475	0.526	0.689	0.402	0.453	0.861		13.5
7	14.7	10.7	52		50	40.9	45.2	0.048	0.669	0.637	0.685	0.817	0.556	0.604	0.882		15.0
8	17.7	10.7	53		50	37.5	45.2	0.040	0.563	0.541	0.581	0.817	0.462	0.502	0.864		17.4
9	14.7	10.7	38		38	29.6	32.0	0.048	0.607	0.578	0.626	0.709	0.482	0.530	0.847		15.0
10	11.7	5.7	32		42	32.1	39.0	0.060	0.584	0.549	0.609	0.862	0.368	0.428	0.703		11.5
11	11.7	7.7	41		54	41.8	49.0	0.060	0.599	0.563	0.623	0.823	0.492	0.552	0.886		11.5
12	13.7	9.7	43		52	44.8	49.4	0.051	0.742	0.704	0.755	0.903	0.593	0.644	0.853		13.5
13	12.7	8.7	44		53	43.5	50.5	0.055	0.674	0.637	0.692	0.908	0.572	0.627	0.906		13.0
14	12.7	9.7	38		44	36.9	40.3	0.055	0.703	0.664	0.719	0.839	0.595	0.650	0.904		12.8
15	14.7	10.7	53		44	34.1	38.2	0.048	0.601	0.572	0.620	0.754	0.513	0.561	0.905		15.0
16	13.7	8.7	45.0		96.0	83.9	95.0	0.051	0.764	0.725	0.776	0.979	0.572	0.623	0.803		14.0
17	14.7	9.7	42.7	46.9	98.0	81.9	90.1	0.048	0.698	0.665	0.713	0.845	0.517	0.565	0.792		15.0
18	12.7	8.7	51.8		119.0	100.3	110.0	0.055	0.710	0.671	0.726	0.854	0.538	0.593	0.817		12.5
19	11.7	7.7	35.6		100.0	79.5	89.7	0.060	0.632	0.594	0.654	0.805	0.482	0.542	0.829		11.5
20	10.7	7.7	38.6	43.2	108.0	82.0	95.8	0.065	0.576	0.538	0.603	0.787	0.515	0.580	0.962		11.0

Table 10 (2) Stem analysis by means of photograph interpretation (Mukwa) With Bark No. 2

	a	b	c		d	e	f	g	h	i	j	k	l	m	n		
No.	H	H_{70}	DBH	(DBH)	Dp (Photo)	$\overline{Dp}$	$\overline{D_{70}}$	0.7/H	$(\overline{Dp}/Dp)^2$	h×(H-0.7)/H	f=g+i	$(\overline{D_{70}}/Dp)^2$	k×(H_{70}-0.7)/H	f_{70}=g+l	f_{70}/f	Remarks	Actual tree height
21	15.7	11.7	52.7	57.8	108.0	80.9	91.0	0.045	0.561	0.536	0.581	0.710	0.497	0.542	0.933		15.5
22	12.7	8.7	44.1		105.0	86.2	98.5	0.055	0.674	0.637	0.692	0.880	0.554	0.609	0.880		12.5
23	13.7	9.7	58.5	61.2	142.0	100.0	115.5	0.051	0.496	0.471	0.522	0.662	0.435	0.486	0.931		13.5
24	11.7	7.7	40.0		102.0	88.4	100.6	0.060	0.751	0.706	0.766	0.973	0.582	0.642	0.838		11.5
25	11.7	7.7	52.8	56.8	142.0	110.7	125.0	0.060	0.608	0.572	0.632	0.775	0.464	0.524	0.829		12.0
26	11.7	7.7	33.8		80.0	66.0	73.3	0.060	0.681	0.640	0.700	0.840	0.503	0.563	0.804		11.5
27	12.7	9.7	52.4		116.0	102.4	113.3	0.055	0.779	0.736	0.791	0.954	0.676	0.731	0.924		12.5
28	11.7	5.7	36.4	40.0	102.0	72.4	89.2	0.060	0.504	0.474	0.534	0.765	0.327	0.387	0.725		11.5
29	10.7	9.7	39.0	41.8	100.0	87.0	90.5	0.065	0.757	0.707	0.772	0.819	0.689	0.754	0.977		11.0
30	13.7	6.7	36.6		83.0	58.1	68.5	0.051	0.490	0.465	0.516	0.681	0.298	0.349	0.676		14.0
31	15.7	10.7	67.1		122.0	105.4	119.2	0.045	0.746	0.713	0.758	0.955	0.608	0.653	0.861		16.0
32	13.7	8.7	41.5	46.6	96.0	78.3	91.5	0.051	0.665	0.631	0.682	0.908	0.530	0.581	0.852		13.5
33	12.7	7.7	39.1		89.0	78.7	86.9	0.055	0.782	0.739	0.794	0.953	0.525	0.580	0.730		13.0
34	12.7	8.7	42.6	45.3	112.0	97.9	107.9	0.055	0.764	0.722	0.777	0.928	0.585	0.640	0.824		13.0
35	16.7	13.7	67.0	74.0	120.0	101.1	109.4	0.042	0.710	0.680	0.722	0.831	0.647	0.689	0.954		17.0
36	17.7	9.7	55.4		101.0	75.0	89.6	0.040	0.551	0.529	0.569	0.787	0.400	0.440	0.773		18.0

Table 11 (1) Stem analysis by means of actual measurement (Mukwa) at 1 m lengths With Bark No. 1

	a	b	c		d	e	f	g	h	i	j	k	l	m	n		
No.	H	H_{20}	DBH	(DBH)	Dp (Photo)	$\overline{Dp}$	$\overline{D_{20}}$	0.7/H	$\overline{(Dp/Dp)^2}$	h×(H-0.7)/H	f=g+i	$\overline{(D_{20}/Dp)^2}$	k×(H_{20}-0.7)/H	f_{20}=g+l	f_{20}/f	Remarks	Actual tree height
37	15.7	9.2	50.2		50.2	42.2	47.3	0.045	0.707	0.675	0.720	0.888	0.481	0.526	0.731		15.8
38	8.7		16.6		16.6	11.9		0.080	0.514	0.473	0.553	0.000	0.000		0.000		9.0
39	7.7		16.0		16.0	11.3		0.091	0.499	0.454	0.545	0.000	0.000		0.000		8.0
40	7.7		16.0		16.0	11.4		0.091	0.508	0.462	0.553	0.000	0.000		0.000		7.4
41	7.7		18.4		18.4	14.9		0.091	0.656	0.596	0.687	0.000	0.000		0.000		8.2
42	8.7		23.6		23.6	16.8		0.080	0.507	0.466	0.546	0.000	0.000		0.000		8.9

Table 11 (2) Stem analysis by means of actual measurement (Mukwa) at 2 m lengths With Bark No. 1

	a	b	c		d	e	f	g	h	i	j	k	l	m	n		
No.	H	H_{20}	DBH	(DBH)	Dp (Photo)	$\overline{Dp}$	$\overline{D_{20}}$	0.2/H	$(\overline{Dp}/Dp)^2$	h×(H-0.2)/H	f=g+i	$(\overline{D_{20}}/Dp)^2$	k×(H_{20}-0.2)/H	f_{20}=g+l	f_{20}/f	Remarks	Actual tree height
43	14.2	8.2	43.8			39.8	44.4	0.014	0.826	0.814	0.828	1.028	0.579	0.593	0.716		14.5
44	10.2		19.7			13.7		0.020	0.484	0.475	0.495	0.000	0.000		0.000		10.5
45	12.2	4.2	27.1			19.5	25.9	0.016	0.518	0.510	0.526	0.913	0.299	0.315	0.599		12.0
46	8.2	1.2	19.9			16.4	19.9	0.024	0.679	0.662	0.686	1.000	0.122	0.146	0.213		7.6
47	10.2	6.2	33.0			28.0	32.0	0.020	0.720	0.706	0.726	0.940	0.553	0.573	0.789		10.0
48	8.2		18.1			14.7		0.024	0.660	0.644	0.668	0.000	0.000		0.000		8.6
49	8.2	2.2	24.2			20.3	24.2	0.024	0.704	0.687	0.711	1.000	0.244	0.268	0.377		7.5
50	10.2	2.2	23.8			18.1	23.8	0.020	0.578	0.567	0.587	1.000	0.196	0.216	0.368		10.0
51	10.2	4.2	24.4			18.7	24.1	0.020	0.587	0.575	0.595	0.976	0.383	0.403	0.677		10.0
52	10.2	2.2	20.8			16.2	20.8	0.020	0.607	0.595	0.615	1.000	0.196	0.216	0.351		9.5
53	10.2	4.2	25.6			17.9	24.7	0.020	0.489	0.479	0.499	0.931	0.365	0.385	0.772		9.7
54	10.2	6.2	43.3	31.1		35.0	40.1	0.020	0.653	0.640	0.660	0.858	0.505	0.525	0.795		11.0
55	10.2	2.2	24.2			16.5	24.2	0.020	0.465	0.456	0.476	1.000	0.196	0.216	0.454		9.6
56	8.2	2.2	21.6			17.9	22.0	0.024	0.687	0.670	0.694	1.037	0.253	0.277	0.399		9.3
57	8.2	1.2	19.0			14.4		0.024	0.574	0.560	0.584	0.000	0.000		0.000		9.3
58	8.2		16.5			13.8		0.024	0.700	0.683	0.707	0.000	0.000		0.000		9.0
59	10.2	2.2	22.4			15.3	22.0	0.020	0.467	0.458	0.478	0.965	0.189	0.209	0.437		9.5
60	8.2		16.4			11.9		0.024	0.527	0.514	0.538	0.000	0.000		0.000		8.5
61	8.2		14.4			10.9		0.024	0.573	0.559	0.583	0.000	0.000		0.000		8.5
62	8.2		12.0			8.5		0.024	0.502	0.490	0.514	0.000	0.000		0.000		8.3

Table 11 (3) Stem analysis by means of actual measurement (Mukwa) at 2 m lengths With Bark No. 2

	a	b	c		d	e	f	g	h	i	j	k	l	m	n		
No.	H	H_{20}	DBH	(DBH)	Dp (Photo)	$\overline{Dp}$	$\overline{D_{20}}$	0.2/H	$(\overline{Dp}/Dp)^2$	h×(H-0.2)/H	f=g+i	$(\overline{D_{20}}/Dp)^2$	k×(H_{20}-0.2)/H	f_{20}=g+l	f_{20}/f	Remarks	Actual tree height
63	8.2		17.6			12.1		0.024	0.473	0.461	0.485	0.000	0.000		0.000		7.8
64	6.2		12.1			9.5		0.032	0.616	0.596	0.628	0.000	0.000		0.000		6.8
65	8.2		16.0			11.8		0.024	0.544	0.531	0.555	0.000	0.000		0.000		7.3
66	8.2		21.0			19.4		0.024	0.853	0.832	0.856	0.000	0.000		0.000		9.0
67	10.2	2.2	21.0			15.7	21.0	0.020	0.559	0.548	0.568	1.000	0.196	0.216	0.380		10.0
68	10.2	2.2	22.0			15.9	22.0	0.020	0.522	0.512	0.532	1.000	0.196	0.216	0.406		10.0

3. STEM ANALYSIS

Mukusi materials were collected from the direct sowing phases in Sisisi Line 2, Sisisi Main Line, and Dambwa as well as from a natural forest in Simungoma east, while those of Mukwa were collected from the direct sowing phase in Dambwa. Based on the data thus acquired, Tables 12 through 17 were prepared, indicating overall diameters and tree heights. Based on a drawing of the above table, Figures 5 and 6 were prepared indicating the tree height growth curves.

Stem analysis intended to obtain reference materials for forest operations was conducted by cutting disks at certain intervals in order to closely examine the process of growth of trees. Stem analysis was conducted as follows: [1] Selection of the trees to be surveyed, [2] felling of the trees selected, [3] Cutting disks at a certain intervals, [4] Examination of each disk for annual rings by marking every fifth annual ring and by measuring the radius at each age grade and entry of the results in the master table of diameters, [5] Preparation of an overall table of diameters and tree heights, and [6] Calculation, if required, of growth rates and volumes based on the data thus obtained, concerning the growth and volumes such as tree heights, diameters, etc.

3.1. Stem Analysis Process

3.1.1. Selection of trees surveyed

It is a matter of course that the purpose of stem analysis is to clarify past growth of the relevant stem. However, in view of the fact that the conditions for growth of the relevant forest stand may be presumed from the process of growth, the trees to be surveyed should be those with average diameters and those with proper and sound shapes and crowns.

Upon selection of the trees to be surveyed, a classification card for each tree surveyed must be prepared. In the classification card, reference matters should be entered such as tree No., the date and place of survey, the species of tree, its height, diameter at breast height, and tree age, as well as site and forest conditions. It would be better to add a sketch drawing to indicate the position of the tree surveyed and a relative crown projection diagram.

3.1.2. Felling of the trees surveyed

(1) Prior to felling, use a piece of chalk to mark the stem at the heights of 0.3 m and 1.3 m from the stem base.

(2) Since the No. 1 disk is to be cut at a height of 0.2 m from the road clearance, fell the tree leaving a sufficient undercut, lest the portion from which a disk could be cut should be damaged.

3.1.3. Gathering of disks

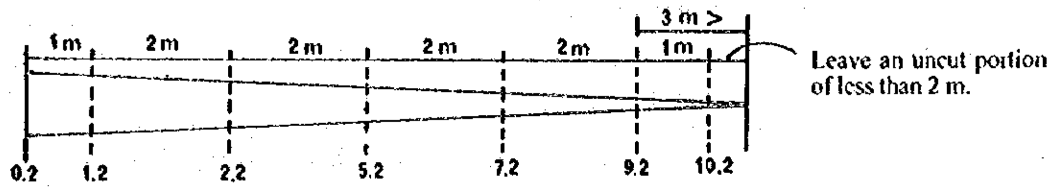
(1) Determining the positions where disks should be cut

1) Place a tape measure at a height of 0.2 m or 1.2 m from the ground marked beforehand. Measure the tree height by pulling the tape measure upward to the treetop. Although the tree height unit is a metre, reading of the height must be done in centimetres.

2) Determining the positions from which disks are to be cut

0.2 m 1.2 3.2 5.2 7.2 9.2
(upward in ascending order)

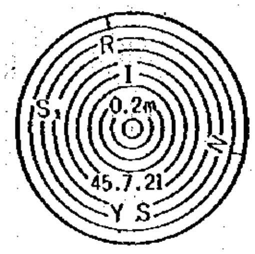
Cut disks beginning at a position of 0.2 m and then upward in an ascending order as described above. When the length of a stem left uncut becomes less than 3 m from the treetop, cut another disk at a position 1 meter from that point, leaving an uncut portion of less than 2 m from the treetop.



Positions for cutting out disks

(2) Cutting out disks

Disks must be cut at each position with a saw applied at a right angle to the stem. Although the thickness of disks may vary according to the size of the stem, usually the thickness is in the range of 3 m to 5 m. After cutting each disk, enter the following details with a felt-tip pen on the back surface of the disk:



I : Tree No. of the surveyed tree
R : Marking the upper inclined position
N : Marking, indicating North direction
S_1 0.2m : Disk No.1, cut at height of 0.2 m from the ground
45.7.21 : Year, Month, and date of disk gathering
Y.S. : Initial of person in charge

Example of entry on disk

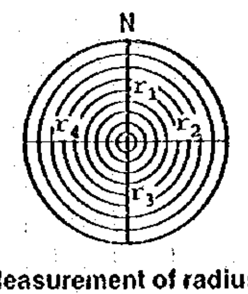
(3) After cutting the disk at the highest position, accurately measure the length of the uncut stem up to the treetop.

3.1.4. Disk survey

(1) Examination of annual rings

With regard to S_1 (Disk No.1), examine as follows:

1) Draw a line passing the center in the north-south direction as well as another line passing the center to cross it at a right angle; thus four radiuses are indicated. The north direction from the center shall be called "I," and the rest shall be called "II," "III" and "IV," respectively one by one clockwise (the radiuses in the directions of II, III, IV, and I shall be called "r_1," "r_2," "r_3," and "r_4," respectively).



Measurement of radius

2) Count the number of annual rings and enter the result on the surface measured. Count annual rings along the radius in four directions from the center outward. After confirming that the number of annual rings in each direction is the same as the numbers of the annual rings counted in other directions, the number shall be decided as the final number of the annual rings of the examined disk. Here, although the basic pith in the center of the disk shall not be counted as an annual ring, the outermost part adjacent to the bark shall be counted.

3) Determine the age of the tree surveyed and enter the result on the disk. The tree age shall be determined by adding the number of ages presumed to have passed up to the time when the tree reached its current height to the number of annual rings (see the above (2) for Disk S_1, cut at a position 0.2 m from the ground).

4) The number of annual rings of the surveyed disks shall be divided into groups of five annual rings, and marked on the annual ring at every multiple of five. First, divide the age determined in accordance with the process stated under 3) by 5. Then count the annual rings from the outermost one until the number of annual rings counted equals the number of fractions obtained as a result of the above division. Mark that annual ring. In case the tree age is 17, then

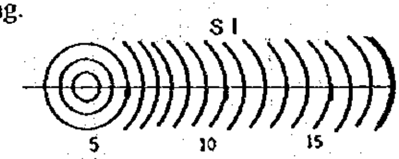
$$17 = 3 \times 5 + 2$$

After the two outermost annual rings are removed, the remaining number of annual rings becomes 15.

Then, count the remaining annual rings from the third outermost one inward and mark every fifth annual ring from there. The number of annual rings finally left in the center may be any number below 5.

5) Repeat the same steps for all of the four radiuses. Then, check the four radiuses and confirm that the marks have been placed on the same annual ring.

6) After the above steps are taken for r_1, the same steps shall be repeated for r_2, r_3, and r_4.



Marking of every fifth annual ring

(2) Measurement of radius

Measure the radius covering every five annual rings and enter the values obtained in the master diameter table. A master diameter table shall be made for each disk. Measurement shall be conducted first for direction I, and then II, III, IV, respectively. Although the unit of measurement is in centimetres, reading of the scale must be made up to the rank next to the unit of measurement. In calculating the average of the four radiuses, the result shall be obtained up to the second rank following the centimetre unit.

(3) Preparation of master diameter table

[Example of Measurement]

See Table 18 Desk measurement table for Mukusi at Buunda woodland.

3.1.5. Preparation of overall tables of diameters and tree heights

(1) Transfer the number of annual rings and diameters per age grade from the master diameter table. The number of annual rings at the cross-section height of 0.0 m, the tree age of the surveyed tree shall be entered. By subtracting the number of annual rings at each cross-section height from the tree age, the number of years that passed until the tree reached the above age may be obtained (Table 15).

(2) Calculation of tree heights

1) The height of a 5-year-old tree equals 1.2 m which is its cross-section height.

2) The height of a 10-year-old tree shall be calculated as follows:

a) With regard to the cross section at the end of the tree grade in question:

Cross-section height: 3.2 m
Years that passed to reach the above height: 9
Next cross-section height: 5.2 m
The years that passed to in order to reach the above height: 15
Therefore, the average annual growth in tree height would be:

$$(5.2 - 3.2)/(15-9) = 2/6 = 0.33$$

b) Accordingly, the height of the 10-year-old tree will be:

$$3.2 + 0.33 = 3.5 \text{ m}$$

3) In the same manner, the height of a 15-year-old tree will be 5.2 m, which equals its cross-section height, and the height of a 20-year-old tree will be:

$$(7.2 - 5.2)/(27-15) = 0.17 \qquad 0.17 \times 5 = 0.85$$

$$5.2 + 0.85 = 6.1 \text{ m}$$

Similarly, the height of a 25-year-old tree will be 6.4 m, and that of a 30-year-old tree will be 7.7 m.

4) The tree height of a final tree age of 34 equals 8.2 m as actually measured.

3.1.6. Preparation of growth curve diagram

The process of growth is indicated in the diagram prepared in accordance with the data obtained from the overall tables of diameters and tree heights. As an example, the growth curve of the tree height for the Buunda woodland is indicated in Figure 5.

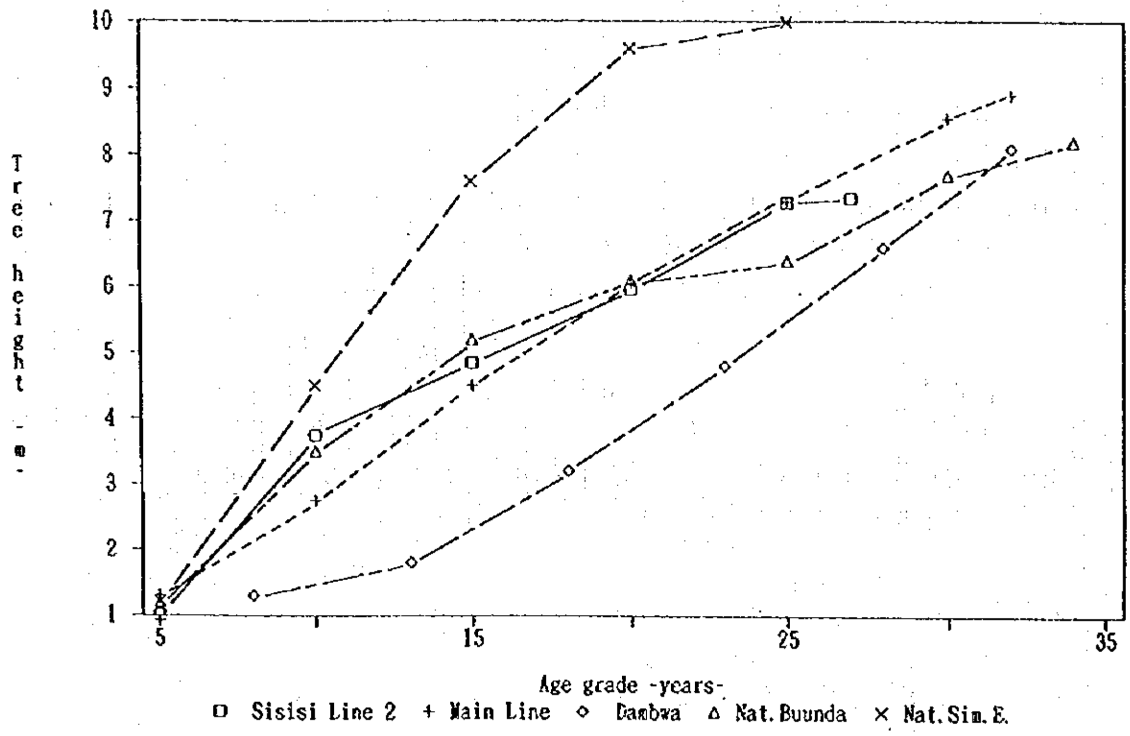


Figure 5 Growth by direct sowing and naturally regenerated Mukusi

3.2. Materials for Analysis of Mukusi

Table 12 Summary of diameter and height (Direct sowing of Mukusi, 29 years, Sisisi Line 2)

Height of section(m)	Number of annual rings	Years to reach to height of section	Mean diameter of each year grade(cm) 5	10	15	20	25	27	(27)	Note
0.0	27	0	2.30	4.70	7.90	10.00	11.70	12.60	3.60	(27): with bark
1.3	20	7		1.70	4.00	5.80	7.40	8.50	9.30	
3.3	19	8		0.90	2.50	3.60	4.70	5.20	5.80	
5.3	10	17				1.10	2.20	2.70	3.10	
Calculated height(m)			1.0	3.7	4.8	6.0	7.3	7.4	7.4	

Table 13 Summary of diameter and height (Direct sowing of Mukusi, 32 years, Sisisi Main Line)

Height of section(m)	Number of annual rings	Years to reach to height of section	Mean diameter of each year grade(cm) 5	10	15	20	25	30	32	(32)	Note
0.0	32	0	1.45	2.35	3.45	6.80	8.10	9.30	9.85	10.85	(32): with bark
0.3	30	2	1.10	2.20	3.35	5.45	7.55	8.90	9.40	10.30	
1.3	27	5		1.40	3.25	5.45	6.40	7.25	7.80	8.50	
3.3	20	12			1.00	2.65	3.70	5.20	5.80	6.40	
5.3	15	17				1.10	2.15	3.20	3.90	4.35	
7.3	7	25						1.50	2.20	2.60	
Calculated height(m)			1.3	2.8	4.5	6.1	7.3	8.6	8.9	8.9	

Table 14 Summary of diameter and height (Direct sowing of Mukusi, 32 years, Dambwa)

Height of section(m)	Number of annual rings	Years to reach to height of section	Mean diameter of each year grade(cm) 8	13	18	23	28	32	(32)	Note
0.0	32	0	4.16	6.02	9.84	12.40	14.71	16.63	17.87	(32): with bark
0.3	29	3	3.20	5.60	9.30	11.80	13.90	15.70	17.00	
1.3	24	8	0.00	4.20	7.50	9.80	11.20	12.60	14.10	
2.2	15	17				1.90	6.50	9.60	10.40	
3.2	14	18				3.60	6.00	8.10	8.90	
4.3	12	20				1.50	3.50	5.50	6.20	
5.4	6	26					0.90	3.40	3.90	
6.6	4	28						2.10	2.40	
calculated height(m)			1.3	1.8	3.2	4.8	6.6	8.1	8.1	

Table 15 Summary of diameter and height (Mukusi natural stand, Buunda woodland)

Height of section(m)	Number of annual rings	Years to reach to height of section	Mean diameter of each year grade(cm) 5	10	15	20	25	30	34	(34)	Note
0.0	34	0	2.9	7.4	9.3	12.9	14.5	16.4	17.6	18.9	(34): with bark
0.3	32	2	2.3	6.2	8.2	11.5	13.3	15.2	16.3	17.6	
1.2	29	5	0.3	2.2	4.7	6.8	9.3	11.2	12.1	13.2	
3.2	25	9		1.2	3.4	5.6	7.1	8.5	9.1	10.2	
5.2	19	15			0.6	2.0	3.7	5.2	5.6	6.4	
7.2	7	27					0.3	1.6	2.2	2.5	
Calculated height(m)			1.2	3.5	5.2	6.1	6.4	7.7	8.2	8.2	

Table 16 Summary of diameter and height (Mukusi natural stand, Simungoma east forest)

Height of section(m)	Number of annual rings	Years to reach to height of section	Mean diameter of each year grade(cm) 5	10	15	20	25	(25)	Note
0.0	25	0	2.8	5.9	8.0	10.0	11.2	11.9	(25):
0.3	24	2	2.3	5.2	7.4	9.3	10.5	11.2	with
1.2	21	5	0.6	2.9	5.5	7.0	8.3	8.9	bark
3.2	20	6	0.2	1.6	3.6	5.3	6.6	7.0	
5.2	14	12			2.0	4.1	5.2	5.7	
7.2	12	14			0.6	2.1	3.5	3.8	
9.2	7	19				0.9	1.7	1.9	
Calculated height(m)			1.2	4.5	7.6	9.6	10.0	10.0	

3.3. Materials for Analysis of Mukwa

Table 17 Summary of diameter and height (Direct sowing Mukwa, 32 years, Dambwa)

Height of section(m)	Number of annual rings	Years to reach to height of section	Mean diameter of each year grade(cm) 13	18	23	28	32	(32)	Note
0.0	32	0	3.30	6.81	10.34	14.48	18.08	20.49	(32):
0.3	24	8	3.30	6.80	10.10	14.00	17.30	19.80	with
1.3	23	9	3.40	6.40	9.30	12.40	14.70	17.50	bark
1.7	23	9	2.00	5.30	8.00	11.30	14.50	17.00	
3.1	20	12	0.90	3.80	6.30	9.50	12.60	14.60	
4.5	17	15		1.60	4.50	6.70	9.20	11.50	
5.7	13	17		0.00	1.90	4.90	7.70	9.40	
6.8	10	22			0.60	3.30	5.90	7.30	
8.3	5	27				0.80	2.90	3.70	
calculated height(m)			3.6	5.7	7.1	8.6	10.3	10.3	

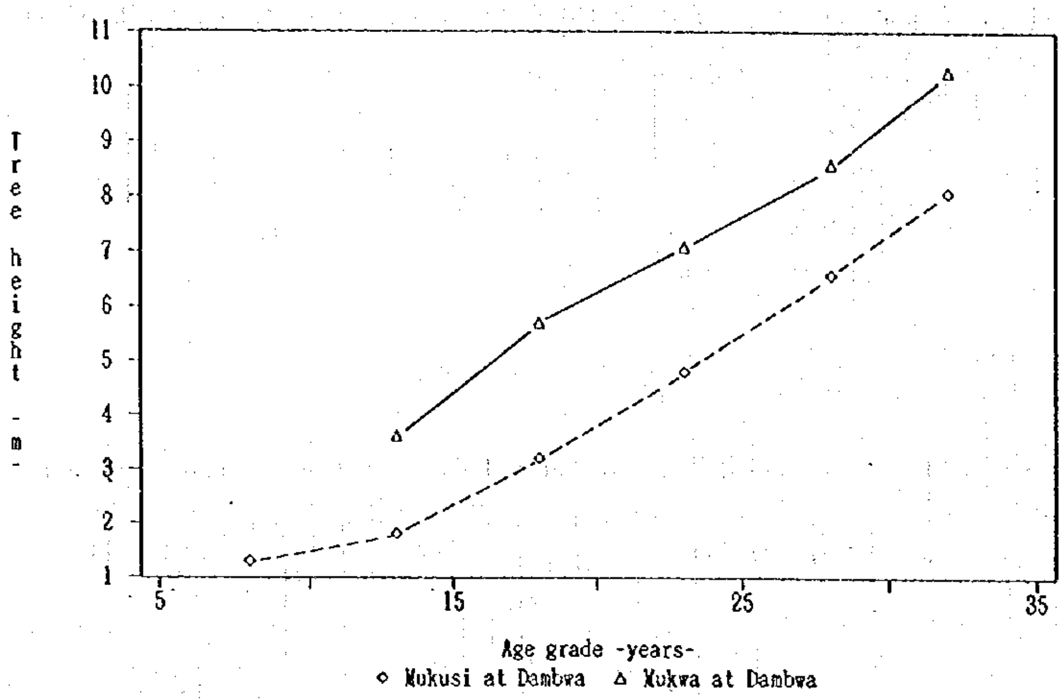


Figure 6 Growth by direct sowing Mukusi and Mukwa at Dambwa

Table 18 Disk measurement table for Mukusi (Natural stand) in Buunda woodland

no.5 to top 1 m No.3 H=8.2

Disk No.	Age	R1	R2	R3	R4	Total	Variation of mean diameter(cm	Note
1	B	8.0		9.7	8.7	26.4		
	34	7.4		9.0	8.0	24.4	1.3	
	30	6.9		8.3	7.6	22.8	1.1	
	25	6.4		7.1	6.5	20.0	1.9	
	20	5.6		6.2	5.5	17.3	1.8	
	15	4.0		4.6	3.7	12.3	3.3	
	10	3.7		3.0	2.6	9.3	2.0	
Disk height	5	1.0		1.3	1.2	3.5	3.9	YR Num.
0.3	0	0.0		0.0	0.0	0.0	2.3	32
2	B	7.0	5.8	7.3	6.3	26.4		
	34	6.4	5.3	6.6	5.8	24.1	1.1	
	30	6.0	5.0	6.0	5.3	22.3	0.9	
	25	4.9	4.3	5.0	4.3	18.5	1.9	
	20	3.6	3.2	3.7	3.1	13.6	2.5	
	15	2.4	2.5	2.3	2.1	9.3	2.1	
	10	1.1	1.1	1.1	1.0	4.3	7.1	
Disk height	5	0.1	0.1	0.2	0.2	0.6	1.9	YR Num.
1.2	0					0.0	0.3	29
3	B	4.7	5.2	6.1	4.3	20.3		
	34	4.2	4.5	5.5	4.0	18.2	1.1	
	30	4.0	4.2	5.0	3.8	17.0	0.6	
	25	3.4	3.6	3.9	3.2	14.1	1.4	
	20	2.7	2.7	3.1	2.6	11.1	1.5	
	15	1.7	1.6	2.0	1.4	6.7	2.2	
	10	0.6	0.6	0.7	0.4	2.3	2.2	
Disk height	0					0.0	1.2	YR Num.
3.2	0					0.0	0.0	25
4	B	3.0	2.7	3.9	3.1	12.7		
	34	2.6	2.5	3.4	2.7	11.2	0.8	
	30	2.4	2.2	3.1	2.6	10.3	0.4	
	25	1.6	1.8	2.1	1.8	7.3	1.5	
	20	0.9	1.1	1.0	1.0	4.0	1.7	
	15	0.3	0.2	0.3	0.3	1.1	4.6	
	0					0.0	0.6	
Disk height	0					0.0	0.0	YR Num.
5.2	0					0.0	0.0	19
5	B	1.2	1.3	1.3	1.2	5.0		
	34	1.1	1.1	1.1	1.1	4.4	0.3	
	30	0.8	0.8	0.8	0.8	3.2	0.6	
	25	0.1	0.2	0.2	0.1	0.6	1.3	
	0					0.0	0.3	
	0					0.0	0.0	
	0					0.0	0.0	
Disk height	0					0.0	0.0	YR Num.
7.2	0					0.0	0.0	7

4. ESTABLISHMENT OF PERMANENT PLOTS

In order that plots may be utilised for the future management of Mukusi resources, four plots of representative forest types were established as Permanent Plots.

The No. 1 Permanent Plot (Figures 7 (1) & 7 (2) and Table 19) was established in the Malavwe Botanical Reserve. Here, the crown coverage rate of Mukusi was 73%, while the maximum values of the tree heights and diameters at breast height were 15 m and 52 cm, respectively. The maximum crown diameter was large, indicating 14 m. In a small tree layer of this Mukusi forest, four tree species including Mwangula and Kangolo were mixed.

The No. 2 Permanent Plot (Figure 8 and Table 20) was established in the Nanga forest. Here, Mukusi was distributed in various storeys including small and large, tree layers, with its maximum height reaching 18 m and its site index belonging to a higher class. Since small and large trees were connected with one another, the diameter at breast height in certain places exceeded 50 cm, and the maximum crown diameter was 15.5 m. With renewed seedlings growing on the forest floor, this plot was observed to be a Mukusi forest having reached maturity. The crown coverage rate and stand density per ha of this plot were 70% and 750, respectively.

The No. 3 Permanent Plot (Figure 9 and Table 21) was established in the Kalama forest. Although Mukusi, which was the dominant species, was growing thickly, its height had not yet reached a large tree layer. DBH in a larger class was in the range of 30 cm to 40 cm, and the maximum crown diameter was 8 m. In this Mukusi forest, seven species, including Muhonono and Mukena, were mixed and the stand density per ha was 1,150. Because of the low values of tree heights, the site index was low compared with that of the Permanent Plot in Nanga. In order to promote resources management, survey areas were established and aimed at following up the growing conditions of renewed seedlings.

The No. 4 Permanent Plot (Figure 10 and Table 22) was established in Samatela woodland. Here, both the number of living trees and the crown coverage rate of Mukwa were higher than those of Mukusi. The numbers and coverage rates of both Mukwa and Mukusi were 10 trees & 36% and 5 trees & 10%, respectively. In addition to the above two species, five tree species, such as Mupumangoma and Mulya, were found to appear as concomitant species in this stand, though their quantities were small. The stand density per ha was 460.

The data of the survey conducted for each tree in the Permanent Plots in four places and the sketches of the sites surveyed are indicated in the following figures and tables. Data were derived from the same materials as contained in the Appendix, which is referred to in Sect. 2.3.2 of the Main Report.

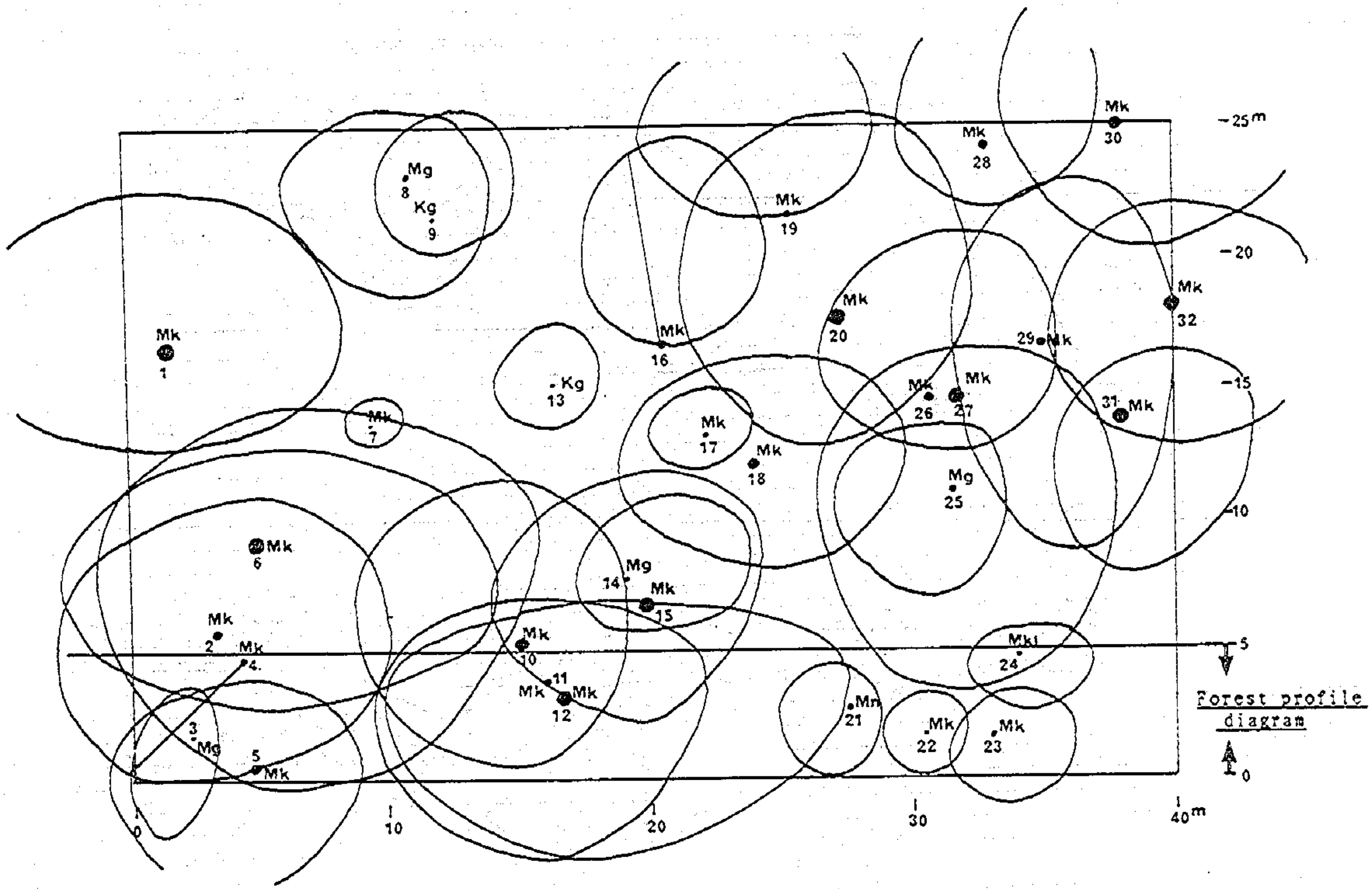


Figure 7 (1) No. 1 Permanent plot (Malavwe Botanical Reserve)

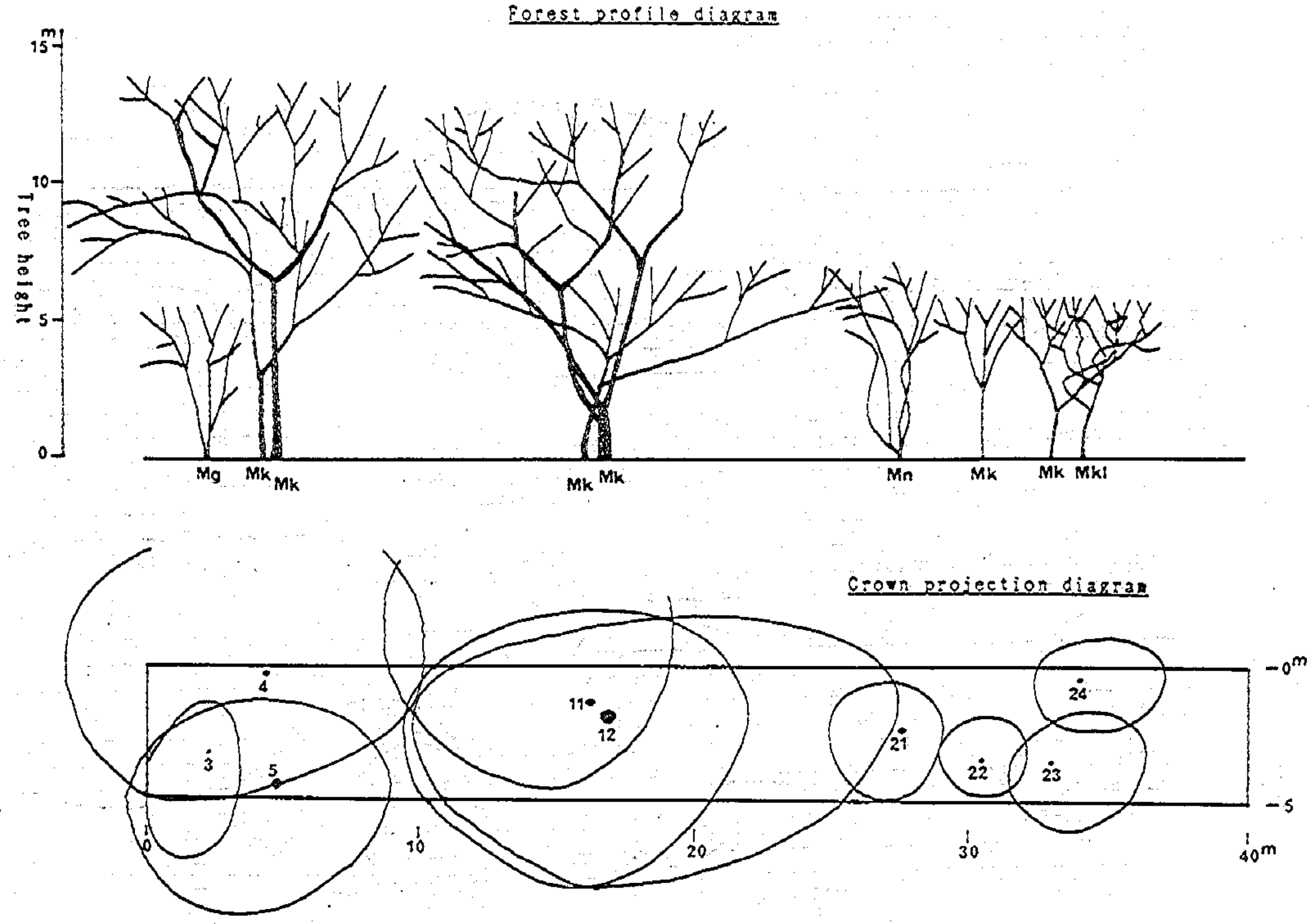


Figure 7 (2) No. 1 Permanent plot (Malavwe Botanical Reserve)

Table 19 No. 1 Permanent plot (Malavwe Botanical Reserve) (B15)

No.	Species	DBH	T.H	C.L	Cr.L	Crn	Crs	Cre	Crw	Remarks
1	Mukusi	46.0	15.0	5.0		10.0		14.6		
2	Mukusi	28.0	15.0	7.0		10.4		16.8		
3	Mwangula	6.0	6.0	1.0		5.2		3.4		
4	Mukusi	22.0	10.0	3.0		10.0		12.8		
5	Mukusi	32.0	14.0	5.0		8.0		10.0		
6	Mukusi	52.0	15.0	4.0		14.6		17.0		
7	Mukusi	6.0	6.0	4.0		1.8		2.2		
8	Mwangula	10.0	9.0	1.0		7.0		8.0		
9	Kangolo	6.0	6.0	3.0		5.2		5.2		
10	Mukusi	35.0	14.0	5.0		11.0		10.2		
11	Mukusi	24.0	7.0	2.0		9.8		17.4		
12	Mukusi	52.0	13.0	2.0		10.0		12.4		
13	Kangolo	6.0	6.0			4.0		4.0		
14	Mwangula	8.0	8.0	3.0		4.8		6.6		2-1
141	Mwangula	8.0	8.0	4.0						2-2
15	Mukusi	42.0	15.0	5.0		9.4		10.0		
16	Mukusi	30.0	14.0	5.0		7.8		6.8		
17	Mukusi	10.0	4.0	2.0		3.2		4.0		
18	Mukusi	34.0	14.0	3.0		8.4		11.0		
19	Mukusi	20.0	11.0	4.0		7.4		9.0		
20	Mukusi	50.0	15.0	3.0		13.0		11.0		
21	Munana	12.0	7.0	4.0		4.4		4.0		
22	Mukusi	10.0	6.0	2.0		3.0		3.2		
23	Mukusi	12.0	6.0	2.0		3.2		5.0		
24	Mukololo	12.0	6.0	3.0		3.2		4.8		
25	Mwangula	14.0	8.0	5.0		6.6		6.4		4-1
251	Mwangula	12.0	8.0	5.0						4-2
252	Mwangula	10.0	8.0	5.0						4-3
253	Mwangula	10.0	8.0	5.0						4-4
26	Mukusi	30.0	15.0	6.0		13.2		11.4		
27	Mukusi	44.0	15.0	4.0		8.2		9.0		
28	Mukusi	26.0	12.0	3.0		9.0		7.6		
29	Mukusi	24.0	12.0	3.0		14.0		8.4		
30	Mukusi	40.0	14.0	4.0		12.0		12.6		
31	Mukusi	40.0	14.0	6.0		8.0		7.4		
32	Mukusi	40.0	15.0	4.0		9.2		10.6		

Species	Height m	DBH cm	Crown diameter m	Number
Mukusi	4-15	6-52	2-14	24
Mwangula	6-9	6-14	4-6.5	8
Kangolo	6	6	3.5-5	2
Mukololo	6	12	3.5	1
Munana	7	12	3.5	1
Total				36

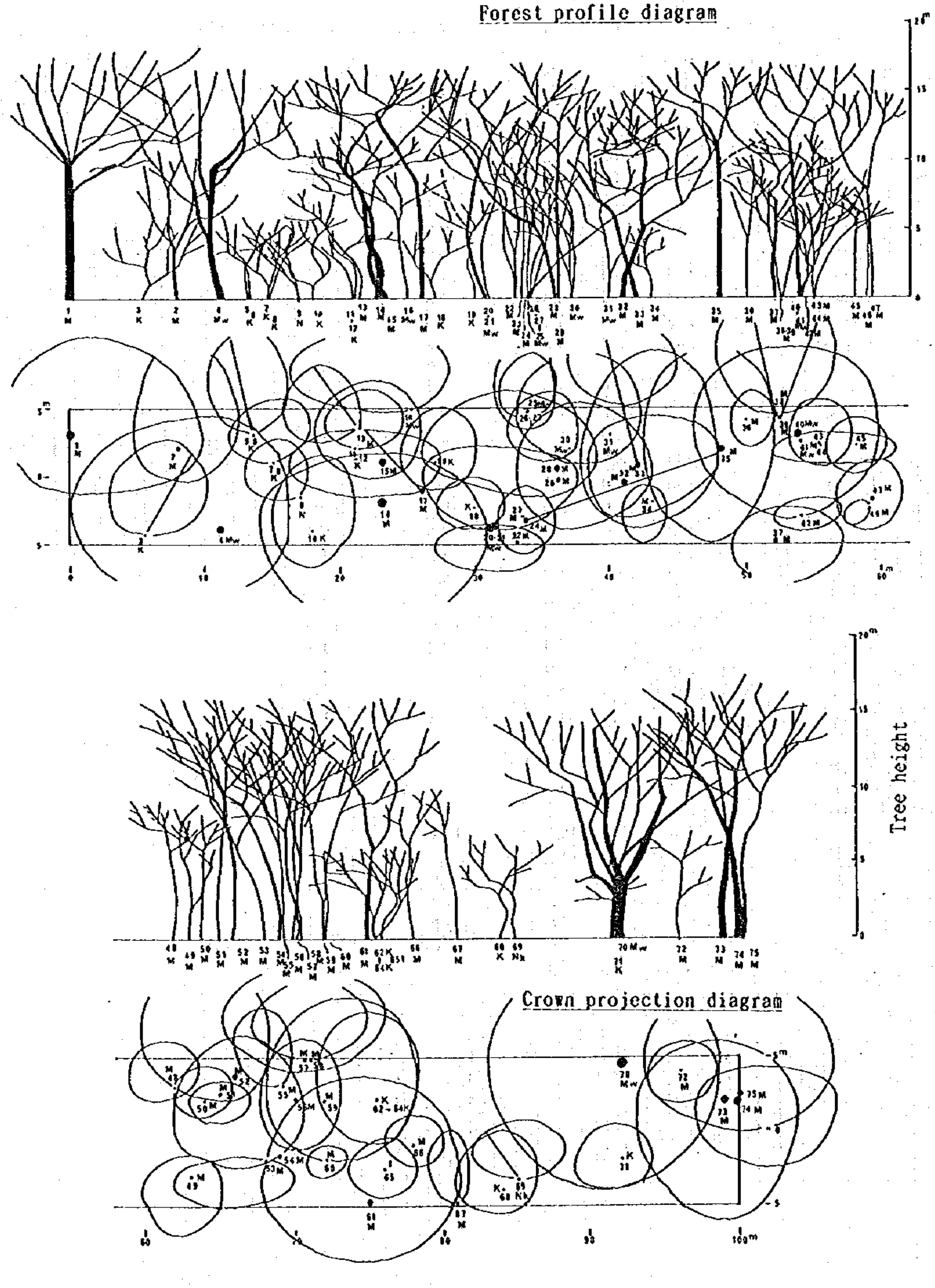


Figure 8 No. 2 Permanent plot (Nanga forest) (No. 8 Belt-transect)

Table 20 (1) No. 2 Permanent plot (Nanga forest) (B08)

No.	Species	DBH	T.H	C.L	Cr.L	Crn	Crs	Cre	Crw	Remarks
1	Mukusi	58.0	18.0	9.0	8.0	4.0	7.0	10.0	8.0	
2	Mukusi	22.5	11.0	4.0	4.0	2.5	8.0	4.5	3.2	
3	Kangolo	6.5	6.0	1.0	4.0		6.0	4.6	2.0	
4	Mwangula	51.0	17.0	10.0	7.0	5.0	8.0	5.5	10.5	
5	Kangolo	7.0	6.0	2.0	3.0					2-1
6	Kangolo	9.0	6.0	2.0	3.0		8.0	2.5	3.0	2-2
7	Kangolo	6.0	5.0	2.0	2.0	0.5	4.0	3.0	3.0	2-1
8	Kangolo	6.0	5.0	2.0	2.0					2-2
9	Nzani	7.0	5.0	3.0	2.5		3.5		4.0	
10	Kangolo	10.0	6.0	2.0	2.0	2.5	5.0	3.0	3.0	
11	Kangolo	8.0	5.0	1.5	2.0		4.0	3.6	2.0	2-1
12	Kangolo	8.0	5.0	1.5	2.0					2-2
13	Mukusi	20.0	8.0	3.0	3.0		5.0		5.6	
14	Mukusi	56.0	17.0	10.0	6.0	11.0	3.0	8.0	9.0	
15	Mukusi	38.0	12.0	6.0	4.0	1.0	6.0	3.0	6.0	
16	Mwangula	14.0	9.0	5.0	3.0		6.0	2.0	8.0	
17	Mukusi	36.0	16.0	9.0	5.0		4.0	2.0	10.2	
18	Kangolo	6.5	5.0	2.0	2.0	2.0	4.0	3.0	2.6	
19	Kangolo	7.0	7.0	3.0	2.5					2-1
20	Mwangula	44.0	16.0	9.0	7.0	2.0	2.0	2.0	3.0	2-2
21	Mwangula	25.0	14.0	7.0	3.0		6.0	6.5	5.0	
22	Mukusi	18.0	13.0	7.0	4.0	2.0	1.0	2.0	6.0	
23	Mukusi	17.0	12.0	6.0	4.0	3.0	2.0	2.0	2.0	
24	Mukusi	34.0	15.0	9.0	4.0	2.0	6.0	8.0		
25	Mwangula	16.0	10.0	4.0	3.0	2.0	7.0	3.0	3.5	
26	Isunde	8.0	8.0	4.0	2.5		6.0	2.5	2.0	2-1
27	Isunde	8.0	8.0	4.0	2.5					2-2
28	Mukusi	37.0	17.0	10.0	7.0	2.0	5.0	3.0	10.0	
29	Mukusi	27.0	15.0	10.0	6.0	6.0	4.0	7.0	3.0	
30	Mwangula	10.0	9.0	4.0	3.0	1.0	4.0	0.5	4.0	
31	Mwangula	14.0	10.0	5.0	4.0	2.0	6.0	2.0	6.5	
32	Mukusi	34.0	13.0	7.0	5.0	2.0	10.0	6.5	3.0	
33	Mukusi	27.0	14.0	10.0	5.0	-5.0	14.0	3.0	4.6	
34	Mukusi	7.0	5.0	2.0	3.0	3.0	1.0	1.0	2.0	
35	Mukusi	34.0	17.0	9.0	7.0	6.0	7.0	4.0	5.6	
36	Mukusi	6.0	9.0	5.0	3.0	2.0	2.0	2.0	1.0	
37	Mukusi	29.0	16.0	8.0	6.0	4.5	2.0	5.0	3.0	
38	Mukusi	30.0	12.0	6.0	5.0	-2.0	10.0	5.0	3.5	
39	Mukusi	20.0	12.0	4.0	4.0	-2.0	10.0		4.0	
40	Mwangula	52.0	17.0	10.0	6.0	6.0	6.0	6.0	8.0	
41	Mwangula	9.0	10.0	3.0	3.0	2.5	2.5	3.5	0.5	
42	Mukusi	10.0	8.0	5.0	3.0	1.0	1.0	3.0	2.0	
43	Mukusi	6.0	7.0	3.0	3.0					2-1
44	Mukusi	8.0	7.0	3.0	3.0	2.0		5.0	2.7	2-2
45	Mukusi	8.0	7.0	4.0	3.0	2.0	2.0	2.0	2.0	
46	Mukusi	7.0	8.0	2.0	1.0	2.0	-0.5		1.5	
47	Mukusi	22.0	15.0	8.0	4.0	3.0	3.0	2.5	2.5	
48	Mukusi	10.0	9.0	4.0	3.0	1.0	3.0	1.5	3.0	
49	Mukusi	16.0	9.0	4.0	3.0	4.0	1.5	2.0	3.0	
50	Mukusi	8.0	8.0	2.0	2.0	1.0	2.0	2.0	2.0	
51	Mukusi	17.0	15.0	8.0	5.0	2.0	0.5	2.0	2.0	
52	Mukusi	32.0	16.0	7.0	5.0	3.0	10.0	3.0	6.0	
53	Mukusi	16.0	14.0	7.0	4.0	3.0		1.0	6.0	
54	Mukusi	28.0	16.0	7.0	6.0		8.0	2.0	7.0	
55	Mukusi	15.0	13.0	7.0	4.0		5.0		4.0	
56	Mukusi	23.0	15.0	8.0	4.0	2.0	4.0	3.0	2.0	
57	Mukusi	27.0	14.0	9.0	4.5	1.0	6.0	6.0	5.0	
58	Mukusi	14.0	12.0	8.0	5.0		5.0	5.0	4.0	

Table 20 (2) No. 2 Permanent plot (Nanga forest) (B08)

No.	Species	DBH	T.H	C.L	Cr.L	Crn	Crs	Cre	Crw	Remarks
59	Mukusi	26.0	14.0	7.0	4.5		7.0	6.0	4.0	
60	Mukusi	6.0	6.0	4.0	2.0	1.0	1.0	1.5	1.0	
61	Mukusi	38.0	16.0	9.0	5.0	4.0	8.5	6.0	7.0	
62	Kangolo	9.0	6.0	2.0	3.0	3.0	6.0	4.0	4.0	3-1
63	Kangolo	7.0	6.0	2.0	3.0					3-2
64	Kangolo	6.0	6.0	2.0	3.0					3-3
65	Isunde	6.5	6.0	2.0	3.0	2.0	2.0	2.0	2.5	
66	Mukusi	7.0	10.0	4.0	3.0	1.5	2.0	2.0	2.0	
67	Mukusi	12.0	10.0	7.0	2.0		5.0		2.0	
68	Kangolo	7.0	4.5	2.0	2.0	4.0	1.5	2.0	3.0	
69	Nankala	10.0	7.0	2.0	2.0		4.0	3.5	3.0	
70	Mwangula	64.0	16.0	10.0	7.0	8.0	9.0	6.5	9.0	
71	Kangolo	8.0	4.0	2.0	2.0	2.0	2.0	2.0	3.0	
72	Mukusi	8.0	7.0	4.0	2.0	2.0	2.0	2.5	2.0	
73	Mukusi	37.0	17.0	8.0	7.0	7.0	4.0	5.0	6.0	
74	Mukusi	34.0	16.0	7.0	5.0	2.0	8.0	6.5	6.0	
75	Mukusi	24.0	15.0	4.0	3.0	4.0	2.0	6.5	3.0	

Species	Height m	DBH cm	Crown diameter m	Number
Mukusi	5-18	8-58	2.5-15.5	45
Kangolo	4-7	6-10	4.5-7	15
Mwangula	9-17	9-64	5-16	10
Isunde	6-8	6-8	4.5	3
Nzani	5	7	4.5	1
Nankala	7	10	5.5	1
Total				75

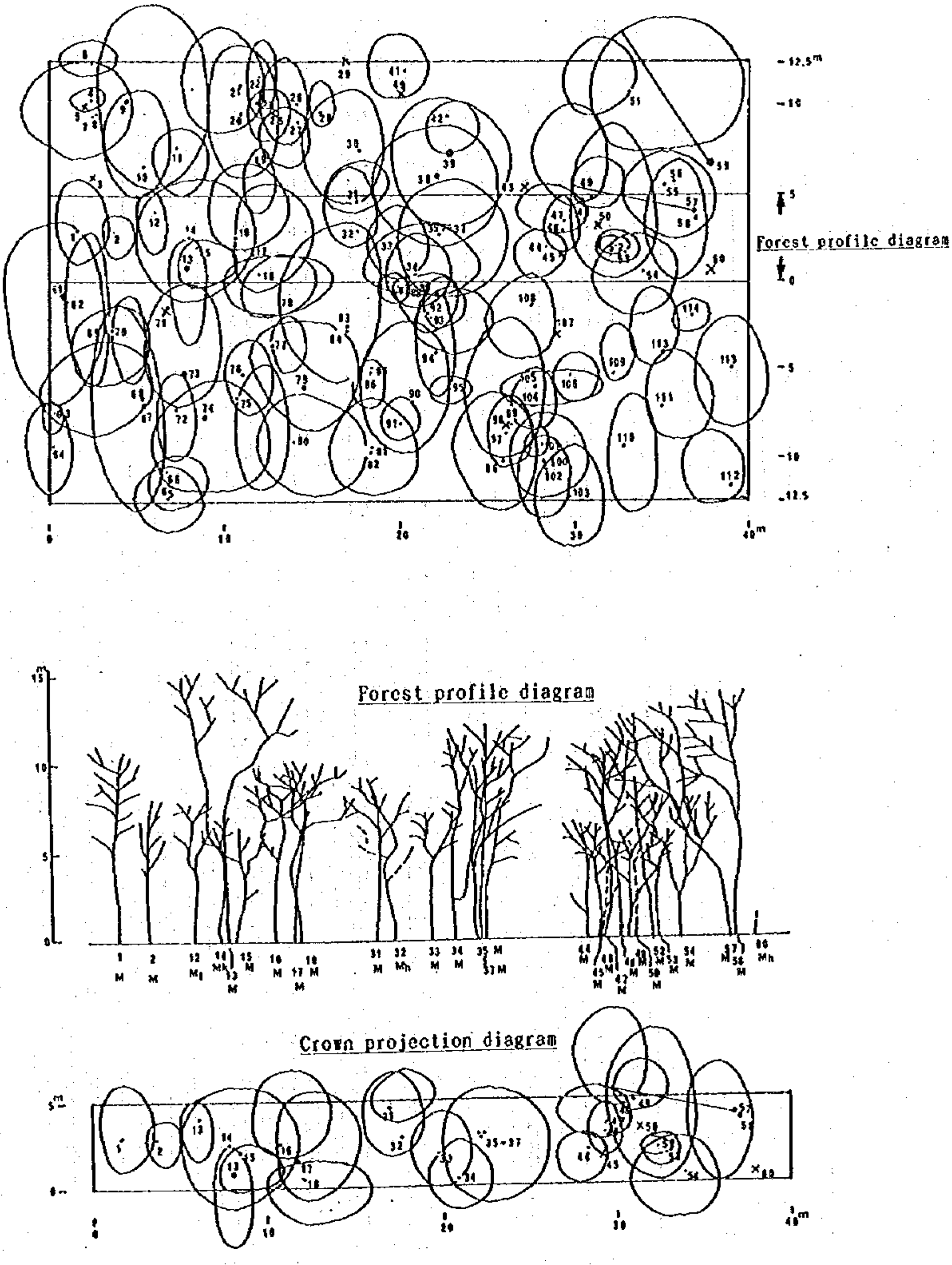


Figure 9 No. 3 Permanent plot (Kalama forest) (No. 14 Belt-transect) No.

Table 21 (1) No. 3 Permanent plot (Kalama forest) (B14)

No.	Species		DBH	TH	CL	CrL	Crn	Crs	Cre	Crw	Remarks
1	Mukusi		12.8	11.0	5.0	4.0	1.7	0.9	3.0	2.0	
2	Mukusi		8.2	8.0	4.0	3.0	1.0	0.2	1.2	2.0	
3	Mukena	(Dead)	10.2	1.5							
4	Mukusi		6.0	7.0	3.0	3.0	0.8	1.2	0.6	0.5	
5	Mukusi		7.4	7.0							
6	Mukusi		8.4	7.0	4.0	2.5	1.5	2.0	1.0	0.9	
7	Mukena		9.5	8.0	3.0	2.0	2.0	4.0	3.0	2.4	2-1
8	Mukena		7.4	6.0	2.5	2.0					2-2
9	Muhonono		20.8	12.5	4.0	5.0	4.8	1.6	4.6	5.0	
10	Muhoto		12.0	12.0	4.0	3.5	1.5	2.3	4.3	2.0	
11	Mukusi		9.4	8.0	4.0	2.5	2.0	0.9	1.0	2.8	
12	Muhoto		9.8	8.0	3.0	3.0	0.8	0.9	1.0	2.4	
13	Mukusi		24.8	15.0	6.0	6.0	4.0	2.9	5.0	2.0	
14	Mukena		6.8	7.0	2.5	2.5	0.6	1.0		3.0	
15	Mukusi		9.5	6.5	3.5	2.5	2.5	0.9	0.4	2.0	
16	Mukusi		11.0	10.0	4.0	4.0	3.0	1.2	4.0	2.4	
17	Mukusi		10.6	9.5	5.0	3.5	3.5	1.0	4.0	2.0	
18	Mukusi		9.6	8.5	4.0	3.0	1.0	2.0	1.4	2.0	
19	Mukusi		8.0	8.0	4.0	2.0	6.9	0.9	1.0	2.8	
20	Mukusi		16.6	13.0	6.0	5.0	2.0	1.9	4.0	3.9	
21	Mukusi		10.2	9.0	5.0	3.0	1.2	3.2	3.5	2.8	
22	Mukusi		10.0	10.0	4.0	2.5	0.8	0.6	2.0	2.5	
23	Mukusi		6.4	6.0	3.0	2.0					3-1
24	Mukusi		10.0	10.0	5.0	3.0	1.6	0.5	0.8		3-2
25	Mukusi		6.0	6.0	3.0	2.0					3-3
26	Mukusi		7.2	8.0	4.0	2.5	0.9	2.0	2.4	2.3	
27	Mukusi		6.0	7.0	3.0	2.0	0.4	2.5	0.6	3.0	
28	Mukusi		6.0	6.0	3.0	3.0	1.4	1.0	2.0	1.0	
29	Muhonono	(Dead)	10.0	10.0							
30	Mukusi		16.2	10.0	4.0	3.5	1.2	4.0	2.0	1.2	
31	Mukusi		6.6	9.0	4.0	3.0	2.0	2.0	2.0	0.6	
32	Muhonono		18.0	8.0	3.0	3.0	1.0	1.9	4.0	2.0	
33	Mukusi		9.6	7.5	4.0	3.0	2.0	1.6	2.4	2.0	
34	Mukusi		11.2	11.0	5.0	3.5	3.6	0.4	3.0	1.0	
35	Mukusi		10.0	10.0	5.0	3.0	4.0	0.6	2.0	3.6	
36	Mukusi		8.8	12.0	5.0	4.0	2.0	2.0	1.6	2.0	
37	Mukusi		10.0	11.5	4.5	3.5	4.0	-1.0	0.6	2.8	
38	Mukusi		23.8	13.0	6.0	5.0	3.5	3.5	3.0	4.0	
39	Muhoto		33.3	12.0	5.0	4.0	4.0	3.2	5.0	4.5	
40	Muhonono	(Dead)	18.0	7.0							
41	Mukusi		6.0	6.0	2.5	2.5	1.2	2.0	2.0	1.4	
42	Mukololo		6.0	4.0			2.0	0.6	0.5	2.0	form top 4m was broken off
43	Muhonono	(Dead)	8.6	6.5							
44	Mukusi		7.0	6.5	3.0	2.5	1.0	1.8	0.6	2.0	
45	Mukusi	(Dead)	6.0	4.5							
46	Mukusi		13.2	10.5	4.0	3.0	1.0	1.0	1.9	1.3	
47	Mukusi		7.4	6.5	4.0	2.0	1.5	3.0	2.0	0.8	
48	Mukusi		14.6	11.0	4.5	6.0	0.8	3.2	5.0	0.9	
49	Mukusi		7.0	6.5	3.0	2.5	2.0	1.2	2.0	0.8	
50	Mukusi	(Dead)	7.2	5.5							
51	Mukusi		9.8	9.0	4.0	3.0	0.3	4.0	3.0	1.0	
52	Mukusi		8.2	9.0	4.0	3.0	0.6	1.5	1.2	0.6	
53	Mukusi		6.6	6.0	2.5	2.0	1.0	1.0	0.4	0.5	
54	Mukusi		10.8	8.0	3.5	3.0	2.0	3.1	2.0	2.4	
55	Mukusi		6.4	5.5	2.0	2.0					2-1
56	Mukusi		8.0	7.0	3.0	2.5	1.7	3.0	3.0	3.2	2-2

Table 21 (2) No. 3 Permanent plot (Kalama forest) (B14)

No.	Species		DBH	T.H	C.L	Cr.L	Crn	Crs	Cre	Crw	Remarks
57	Mukusi		25.5	13.0	6.0	5.5	-2.0	7.0	5.0	1.0	
58	Mukusi		28.0	14.0	7.5	5.5	0.5	3.0	3.0	3.6	
59	Muhonono		27.0	12.0	3.0	5.5	2.0	7.0	8.0	-1.5	
60	Muhonono	(Dead)	30.0	1.5							
61	Mukusi		33.2	14.5	7.0	6.0	2.5	3.0	4.0	6.0	
62	Mukusi		22.0	13.0	5.5	5.0	2.5		4.0	5.0	
63	Sibobo		7.8	3.0	1.0	1.5	0.6	0.6	0.6	1.2	
64	Mukusi		7.4	6.0	2.5	2.5	1.0	1.4	2.6	2.8	
65	Mukusi		6.0	5.0	2.5	2.0	2.0	2.0	1.6	2.0	
66	Mukusi		15.0	10.0	5.0	3.5	2.5	1.0	1.0	2.0	
67	Mukusi		24.4	12.0	6.0	4.0	1.0	3.0	5.5	6.0	
68	Mukusi		19.4	11.0	6.0	4.0	0.5	6.0	3.0	1.9	
69	Mukusi		12.4	8.5	4.0	3.0	2.5	2.0	1.4	2.6	
70	Mukusi		6.2	6.0	2.5	2.0	2.0		2.0	3.0	
71	Muhonono	(Dead)	37.5	6.0							
72	Mukusi		15.0	9.0	4.0	3.5	1.2	1.0	2.9	4.0	
73	Mukusi		29.2	13.0	6.0	5.0	2.0	3.0	5.0	2.0	
74	Mukusi		24.6	14.0	7.0	5.0	4.0	3.1	2.0	4.0	
75	Mukusi		9.8	9.0	4.0	3.0	3.0		2.0	5.0	
76	Mukusi		13.8	10.0	4.5	3.5	1.9	1.0	2.0	2.0	
77	Mukusi		15.8	12.0	6.0	4.0	2.0		2.0	1.5	
78	Mukusi		7.0	6.0	2.5	2.0		2.6	3.0	0.6	
79	Mukusi		20.4	12.0	5.0	4.0	3.2	3.0	4.0	2.4	
80	Mukusi		16.0	9.5	4.0	3.5	4.0	2.3	2.5	3.0	
81	Mukusi		16.2	9.0	5.0	3.5	2.5	2.4	3.0	2.6	2-1
82	Mukusi		9.4	7.0	3.0	2.5					2-2
83	Musilu		12.8	11.5	4.0	3.0	2.0	4.0	6.0	3.0	2-1
84	Musilu		10.0	10.0	4.0	3.0					2-2
85	Mukusi		7.6	5.0	1.5	2.0	1.0	0.9	0.6	2.0	
86	Mukusi		12.4	9.0	5.0	3.0	1.0	1.6	6.0	-1.5	
87	Mukusi		9.8	9.0	4.0	3.0	0.9	1.2	0.5	2.0	
88	Mukusi		15.2	11.5	5.5	4.0	4.0	2.5	3.5	0.5	
89	Mukusi		9.4	7.0	3.0	2.0	2.5	0.8	0.5	2.5	
90	Mukusi		22.0	10.0	6.0	4.0	2.0	3.0	4.5	3.0	
91	Mukusi		6.4	7.0	3.0	2.5	1.0	0.9	1.6	1.0	
92	Mukusi		12.8	11.5	6.0	4.0	2.0	0.4	2.0	1.0	
93	Mukusi		8.8	7.0	2.5	2.5	3.4	0.5	1.0	1.9	
94	Muhonono		18.0	9.0	5.0	3.0	1.0	1.1	3.0	2.5	
95	Mukusi		6.0	6.0	3.0	2.0	1.2	1.2	0.8	1.0	
96	Mukusi		20.0	12.0	5.0	5.0	2.0	3.0	4.0	2.9	
97	Mukusi		12.4	9.0	4.0	2.5	1.5	1.2	2.2	2.0	
98	Mukusi	(Dead)	8.0	3.5							
99	Mukusi		24.0	12.0	6.0	4.5	2.0	2.6	6.0	2.0	
100	Sibobo		11.2	5.0	1.5	2.0	2.5	2.0	2.6	2.2	
101	Mukusi		14.8	11.0	3.5	2.5	0.4	0.8	1.9	0.6	
102	Mukusi		19.4	13.0	5.0	6.0	1.5	1.5	2.0	3.0	
103	Mukusi		22.4	15.0	6.0	7.0	2.0	2.0	3.0	3.0	
104	Isunde		6.0	4.0	1.5	2.0	2.0	1.5	1.0	1.6	
105	Mukusi		9.0	8.0	4.0	2.5	4.0	2.0	0.9	1.0	
106	Mukusi		7.0	6.0	2.5	2.5	1.5	1.0	1.5	1.5	
107	Mukusi	(Dead)	8.0	8.5							
108	Mukusi		15.4	10.0	5.0	3.0	1.2	2.5	2.0	3.0	
109	Mukusi		7.1	7.0	3.0	2.5	0.9	0.6	3.0	0.5	
110	Mukusi		22.6	13.0	4.0	5.0	2.0	0.9	3.0	4.0	
111	Mukusi		21.6	12.0	5.0	5.0	3.0	1.0	3.0	2.0	
112	Mukusi		8.0	7.0	4.0	2.0	0.9	3.0	3.0	0.5	

Table 21 (3) No. 3 Permanent plot (Kalama forest) (B14)

No.	Species	DBH	T.H	C.L	Cr.L	Crn	Crs	Cre	Crw	Remarks
113	Mukusi	22.2	12.0	6.0	4.0	1.0	2.0	4.0	0.6	
114	Mukusi	6.0	4.0	2.0	1.0	1.0	1.0	1.0	1.0	
115	Mukololo	15.0	10.0	4.0	4.0	2.0	2.0	3.0	3.4	

Species	Height m	DBH cm	Crown diameter m	Number
Mukusi	5-15	6-33	1.5-8	92
Muhonono	7-12	9-38	3.5-7.5	9
Mukena	6-8	7-10	4-5.5	4
Muhoto	8-12	10-33	2-8	3
Mukololo	4-10	6-15	3-5	2
Sibobo	3-5	8-11	1.5-4.5	2
Musilu	10-11	10-13	7.5	2
Isunde	4	6	3.5	1
Total				115

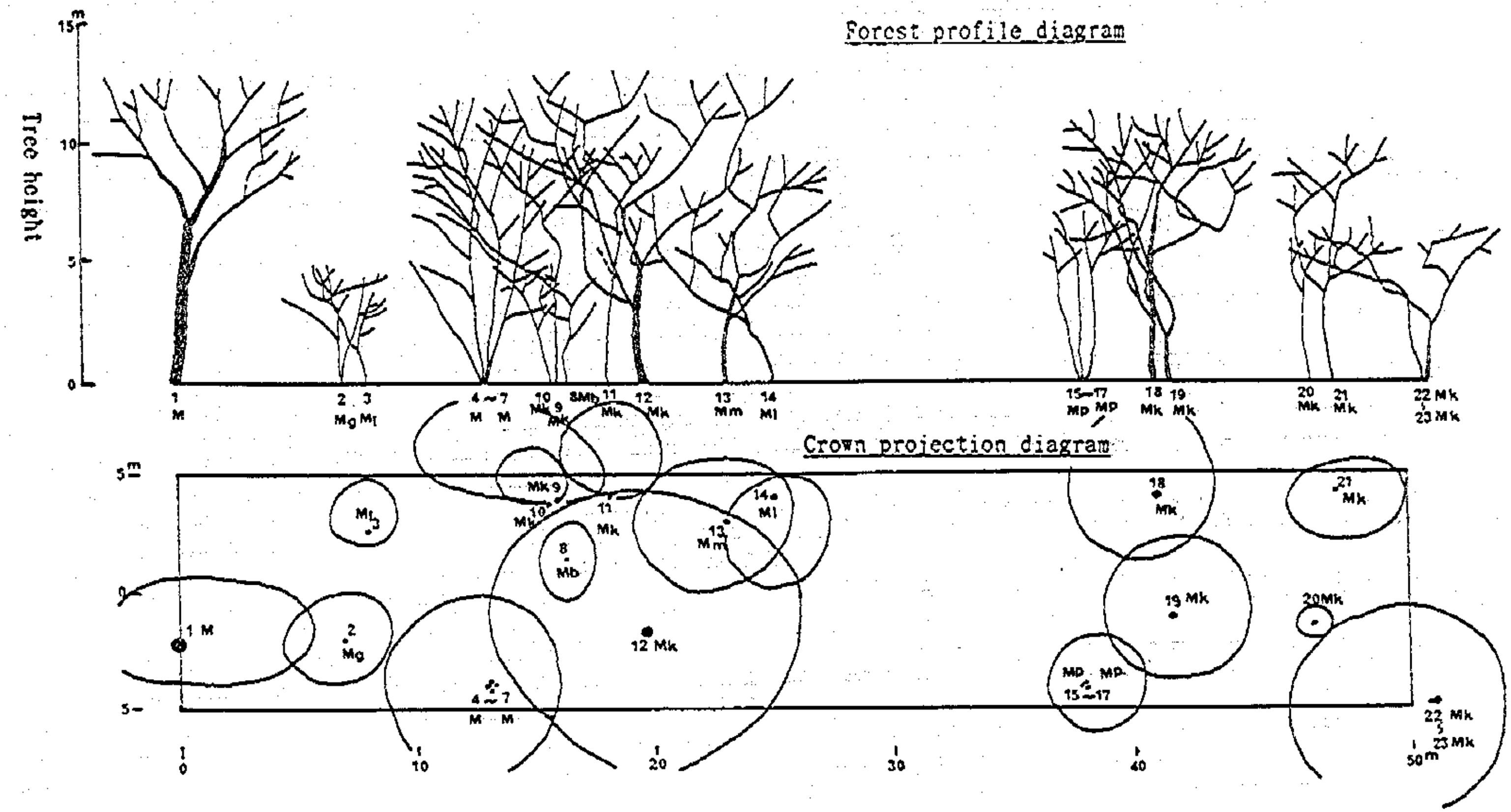


Figure 10 No. 4 Permanent plot (Samatela woodland) (No. 7 Belt-transect)

Table 22 No. 4 Permanent plot (Samatela woodland) (B07)

No.	Species	DBH	T.H	C.L	Cr.L	Crn	Crs	Cre	Crw	Remarks
1	Mukusi	47.5	13.0	7.0	5.0	5.5	3.5	2.0	3.0	
2	Mukenge	8.0	5.0	2.0	3.0	2.0	2.5	2.0	2.0	
3	Mulya	8.0	4.0	1.0	2.0	1.0	1.5	0.5	2.5	
4	Mukusi	23.0	12.0	4.0	6.0	3.0	4.5	4.0	4.0	4-1
5	Mukusi	20.0	12.0	4.0	6.0					4-2
6	Mukusi	14.0	10.0	3.0	4.0					4-3
7	Mukusi	10.5	5.0	2.0	3.0					4-4
8	Mububu	7.0	5.0	2.0	2.0	1.5	1.0	2.0	1.5	
9	Mukwa	20.5	10.0	4.0	4.0	2.0	6.0		4.0	
10	Mukwa	7.0	5.0	3.0	2.0	0.5	2.0		2.0	
11	Mukwa	20.0	10.0	4.0	3.0	2.3	1.5		4.0	
12	Mukwa	43.0	13.0	6.0	5.0	6.5	7.0	6.5	6.0	
13	Muhamani	18.0	9.5	4.0	3.0	4.5		3.0	1.5	
14	Mulya	21.0	8.0	3.0	3.0	0.5	6.0	4.0	1.0	
15	Mupumangoma	6.0	6.0	3.0	2.5					3-1
16	Mupumangoma	7.0	7.0	3.0	2.5	2.5	1.5	2.0	2.0	3-2
17	Mupumangoma	7.0	7.0	3.0	2.5					3-3
18	Mukwa	28.0	11.0	5.0	5.0	2.5	3.5	2.5	4.0	
19	Mukwa	25.0	10.0	6.0	3.5	3.5	2.5	2.5	3.0	
20	Mukwa	8.0	6.0	2.0	2.0	0.5	0.5	0.5	0.5	
21	Mukwa	13.5	10.0	5.0	3.0	2.5	2.0	2.0	1.0	
22	Mukwa	16.0	5.0	3.0	2.5					2-1
23	Mukwa	21.0	6.0	3.0	3.0	3.0	6.0	6.0	4.0	2-2

Species	Height m	DBH cm	Crown diameter m	Number
Mukusi	5-13	10-47	7.5	5
Mukwa	5-13	7-43	1.5-1.3	10
Mupumangoma	6-7	6-7	4	3
Mulya	4-8	8-21	3-6.5	2
Mukenge	5	8	4.5	1
Mububu	5	7	2.5	1
Muhamani	9	18	4.5	1
Total				23

5. HERB SURVEY

A survey of the Buunda grassland was conducted in order to acquire additional materials for the preparation of land-use and vegetation maps. In the grasslands widely distributed adjacent to woodlands, lines of 100 m in length were established where line-transect surveys were conducted for the sections of 10 m length, each from vegetation of representative types covering the lengths of 0~10 m and 45~55 m (Table 23). In the survey, 1 m was set as the width of the lines surveyed, and thus the area of each plot was $1m^2$. The extent of coverage and the frequency of vegetation in the area were examined. The number of herb species and woody plants appearing there were 17 species and 1 woody plants, respectively. The extent of coverage of the entire line was 3.3, and more than half of the section surveyed was covered with herbs. the most dominant herb species was Nkolokoti, with its frequency being large. Among the woody plants growing there, Mubako, which was dominant in the adjacent woodland, had a high coverage. Also, shrubs and seedlings of 2 m to 4 m and 20 m to 40 m in their respective heights were found in small quantities in the sections surveyed.

Table 23 No. 1 Line-transect (Buhunda grassland)

Plot No. / Species	1	2	3	4	5	6	7	8	9	10	Mean degree	Frequency %	46	47	48	49	50	51	52	53	54	55	Mean degree	Frequency %
	Cover degree												Cover degree											
Mubako	5										0.5	10				1	5	3					0.9	30
Nkolokoti	3	3	1	1	1	2	1	1	1	1	1.5	100	1	1		1		1	1	1	1	1	0.8	80
Lutingenia		1	2	1	1		1	1			0.7	60											0	0
Mubunbu		1		+							0.1	10											0	0
Kabolabola		1	1	1	2	2	1	1	1	1	1.1	90				1			1	1	1	1	0.5	50
Mwange				1	1	1	1	1	1	1	0.7	70	1		1		1	1	1	1		1	0.7	70
Kabubo						1		1	1	1	0.4	40											0	0
Kasokwani							1		1	1	0.3	30	1	1		2	1	1		1	1		0.8	70
Liyangayanga									1	1	0.2	20										1	0.1	10
Kambole										1	0.1	10											0	0
Katamu											0	0	1										0.1	10
Munyelenyele											0	0				1		1					0.2	20
Mubilo											0	0				1	2	1			1	1	0.6	50
Musheshe											0	0				1							0.1	10
Busambo											0	0								1			0.1	10
A	2										0.2	10											0	0
B				1	1	1					0.3	30			1							1	0.2	20
C							1				0.1	10											0	0
D								1			0.1	10											0	0
E											0	C		1									0.1	10
F											0	0							1				0.1	10
Mean total	5	3	3	3	4	4	3	3	3	3	3.4		2	3	1	5	5	5	2	3	3	2	3.1	

Notes
A,B,C,D,E,F : Unknown species

Cover degree: 5… 81～100% 2… 21～40%
4… 61～80% 1… 1～20%
3… 41～60% +… 1%>

6. SURVEY OF SILVICULTURES

Data listed here are detailed materials obtained from the sites where direct sowing was conducted as described in general in the Main Final Report. Items such as single stems, plural stems, and coppicing stems are classified for each line surveyed.

Mukusi

Tables 24 (1) and (2)	: Sisisi Line 2
Tables 25 (1) and (2)	: Sisisi Main Line
Table 26	: Nalusoko A
Table 27	: Nalusoko B
Table 28	: Nalusoko C
Tables 29 (1) and (2)	: Dambwa

Mukwa

Tables 30 (1) and (2)	: Dambwa

Table 24 (1) Assessment of trial plantation

Tree species: Mukusi
Location: Sisisi Line 2
Sowing year: 1965

Survey line No.	Stem condition	Number of trees	Tree height (m)		DBH (cm)		Number of coppices per stock		Height of coppice (m)	
			Average	Range	Average	Range	Average	Range	Average	Range
1	Main stem	27	6.8	2.8-10	11.6	2-21				
	Plural stem	(8)								
	Coppicing stem	46					12	2-23	0.7	0.4-1.5
	Main s. + Copp. s	(14)					8	3-7	0.9	0.5-3.0
	Dead stem									
	Total	73								
2	Main stem	19	6.8	5-9	9.3	5-18				
	Plural stem	(4)								
	Coppicing stem	46					11	1-25	0.7	0.4-1.6
	Main s. + Copp. s	(11)					9	1-17	0.7	0.6-1.0
	Dead stem	1	7.0							
	Total	66								
3	Main stem	25	7.1	2.6-10	10.4	2-18				
	Plural stem	(12)								
	Coppicing stem	43					14	4-47	0.6	0.4-1.2
	Main s. + Copp. s	(3)					5	2-9	0.7	0.6-1.0
	Dead stem									
	Total	68								
4	Main stem	12	7.0	6-12	8.6	6-15				
	Plural stem	(3)								
	Coppicing stem	57					13	2-38	0.7	0.4-1.5
	Main s. + Copp. s	(4)					6	3-10	0.6	0.6
	Dead stem	1								
	Total	70								
5	Main stem	18	7.6	5-10	13.0	6-22				
	Plural stem	(6)								
	Coppicing stem	50					14	1-50	0.7	0.4-2.0
	Main s. + Copp. s	(9)					6	1-23	0.9	0.4-2.0
	Dead stem									
	Total	68								

Table 24 (2) Assessment of trial plantation

Tree species: Mukusi
Location: Sisisi Line 2
Sowing year: 1965

Survey line No.	Stem condition	Number of trees	Tree height (m)		DBH (cm)		Number of coppices per stock		Height of coppice (m)	
			Average	Range	Average	Range	Average	Range	Average	Range
6	Main stem	40	8.0	5-10.5	12.5	7-21				
	Plural stem	(14)								
	Coppicing stem	12					6	2-10	0.5	0.3-0.8
	Main s. + Copp. s	(8)					6	1-12	0.7	0.4-1.0
	Dead stem	2								
	Total	54								
7	Main stem	38	8.5	6.5-11	11.7	6-22				
	Plural stem	(10)								
	Coppicing stem	14					11	2-30	0.6	0.3-0.8
	Main s. + Copp. s	(10)					3	1-8	0.6	0.4-0.8
	Dead stem	5	6.3	6-7						
	Total	57								
8	Main stem	31	8.8	7-14	9.9	5-20				
	Plural stem	(11)								
	Coppicing stem	13					7	1-15	0.5	0.2-0.8
	Main s. + Copp. s	(8)					4	1-18	0.8	0.6-1.2
	Dead stem	5	4.6	1.5-6						
	Total	49								
9	Main stem	34	7.9	6-9.5	10.1	5-14				
	Plural stem	(5)								
	Coppicing stem	17					8	4-16	0.5	0.3-1.0
	Main s. + Copp. s	(18)					5	1-12	0.9	0.5-1.2
	Dead stem	1	6.0							
	Total	52								
10	Main stem	32	7.2	5-10	9.6	5-24				
	Plural stem	(5)								
	Coppicing stem	21					9	3-27	0.5	0.2-1.0
	Main s. + Copp. s	(15)					6	1-18	0.3	0.2-1.0
	Dead stem	2	1.3	6-2						
	Total	55								
Mean total	Main stem	276	7.6	2.8-12	10.7	2-24				
	Plural stem	(78)								
	Coppicing stem	319					11	1-50	0.6	0.2-2.0
	Main s. + Copp. s	(100)					5	1-23	0.8	0.2-3.0
	Dead stem	17								
	Total	546								

Table 25 (1) Assessment of trial plantation

Tree species: Mukusi
Location: Sisisi Main Line
Sowing year: 1962

Survey line No.	Stem condition	Number of trees	Tree height (m)		DBH (cm)		Number of coppices per stock		Height of coppice (m)	
			Average	Range	Average	Range	Average	Range	Average	Range
1	Main stem	12	10.0	7-11	16.9	10-26				
	Plural stem	(2)								
	Coppicing stem	3					4	2-7	1.8	0.8-2.5
	Main s. + Copp. s	(1)					4		1.2	
	Dead stem	3	7.3	6.5-8						
	Total	18								
2	Main stem	10	8.4	4-10.5	12.1	2-22				
	Plural stem	(2)								
	Coppicing stem	7					7	4-15	1.3	0.6-2.0
	Main s. + Copp. s	(2)					5	4-6	1.7	1.6-1.8
	Dead stem	1	0.9							
	Total	18								
3	Main stem	13	9.0	7-11	13	10-18				
	Plural stem	(1)								
	Coppicing stem	16					3	1-8	1.0	0.3-2.0
	Main s. + Copp. s	(1)					8		1.0	
	Dead stem	1	7.0							
	Total	30								
4	Main stem	10	8.2	7-9.5	9.5	6-14				
	Plural stem									
	Coppicing stem	22					7	1-25	0.8	0.3-2.5
	Main s. + Copp. s									
	Dead stem	1	8.0							
	Total	33								
5	Main stem	5	9.1	6-10.5	11.4	6-20				
	Plural stem	(3)								
	Coppicing stem	22					6	1-19	1.2	0.3-2.5
	Main s. + Copp. s	(1)					2		1.4	
	Dead stem	1	6.5							
	Total	28								

Table 25 (2) Assessment of trial plantation

Tree species: Mukusi
Location: Sisisi Main Line
Sowing year: 1962

Survey line No.	Stem condition	Number of trees	Tree height (m)		DBH (cm)		Number of coppices per stock		Height of coppice (m)	
			Average	Range	Average	Range	Average	Range	Average	Range
6	Main stem	12	7.7	6-9	9.8	5-20				
	Plural stem									
	Coppicing stem	14					8	2-26	1.0	0.5-2.0
	Main s. + Copp. s									
	Dead stem	1	8.0							
	Total	27								
7	Main stem	9	6.8	5-9.5	7.9	4-16				
	Plural stem									
	Coppicing stem	15					7	1-22	1.0	0.3-2.2
	Main s. + Copp. s	(4)					5	2-8	1.2	0.4-3.0
	Dead stem	2	2.3	0.6-4						
	Total	26								
8	Main stem	10	7.8	5-10	9.9	4-17				
	Plural stem									
	Coppicing stem	19					5	2-13	0.9	0.3-1.3
	Main s. + Copp. s	(6)					3	1-6	0.8	0.5-1.0
	Dead stem	1	6.0							
	Total	30								
9	Main stem	12	8.7	8-10	9.8	6-15				
	Plural stem									
	Coppicing stem	14					4	2-6	0.8	0.3-1.8
	Main s. + Copp. s	(6)					5	2-8	1.0	0.3-1.6
	Dead stem	3	5.0	2.5-7.5						
	Total	29								
10	Main stem	10	9.0	7-10	11.7	8-16				
	Plural stem									
	Coppicing stem	27					5	2-15	1.1	0.6-2.2
	Main s. + Copp. s	(3)					5	1-9	1.4	1-1.8
	Dead stem	1	6.5							
	Total	38								
Mean total	Main stem	103	8.5	4-11	11.2	2-26				
	Plural stem	(8)								
	Coppicing stem	159					6	1-26	1.1	0.3-2.5
	Main s. + Copp. s	(24)					4	1-9	1.2	0.3-3.0
	Dead stem	15								
	Total	277								

Table 26 Assessment of trial plantation

Tree species: Mukusi
Location: Nalusoko
Sowing year: 1962
Treatment: A

Survey line No.	Stem condition	Number of trees	Tree height (m)		DBH (cm)		Number of coppices per stock		Height of coppice (m)	
			Average	Range	Average	Range	Average	Range	Average	Range
1	Main stem	19	6.7	3.5-9	7.7	4-12				
	Plural stem	(11)								
	Coppicing stem	3					3	2-4	1.6	1.2-2.4
	Main s. + Copp.s									
	Dead stem	2	4.8	3.5-6						
	Total	24								
2	Main stem	10	6.3	6-8.5	7.9	4-15				
	Plural stem	(6)								
	Coppicing stem	4					2	1-3	1.5	1.3-1.6
	Main s. + Copp.s									
	Dead stem	1	3.5							
	Total	15								
3	Main stem	11	7.1	5-8	7.9	5-11				
	Plural stem	(2)								
	Coppicing stem	4					1	1-2	1.9	1.2-2.5
	Main s. + Copp.s									
	Dead stem	1	5.0							
	Total	16								
4	Main stem	16	6.0	3.5-8.5	6.2	3-9				
	Plural stem	(3)								
	Coppicing stem	5					2	1-6	2.0	0.3-2.8
	Main s. + Copp.s	(1)							1.0	1.5
	Dead stem	3	4.0	1-7						
	Total	24								
5	Main stem	12	6.4	3.5-9	5.9	3-16				
	Plural stem	(6)								
	Coppicing stem	5					3	2-4	1.6	0.3-1.9
	Main s. + Copp.s									
	Dead stem	2	4.5	4-5						
	Total	19								
Mean total	Main stem	68	6.5	3.5-9	7.1	3-16				
	Plural stem	(28)								
	Coppicing stem	21					2	1-6	1.7	0.3-2.8
	Main s. + Copp.s	(1)							1.0	1.5
	Dead stem	9								
	Total	98								

Table 27 Assessment of trial plantation

Tree species: Mukusi
Location: Nalusoko
Sowing year: 1962
Treatment: B

Survey line No.	Stem condition	Number of trees	Tree height (m)		DBH (cm)		Number of coppices per stock		Height of coppice (m)	
			Average	Range	Average	Range	Average	Range	Average	Range
1	Main stem	18	5.6	3.5-6	5.0	2-8				
	Plural stem	(7)								
	Coppicing stem	4					5	3-6	0.7	0.5-0.8
	Main s. + Copp.s									
	Dead stem									
	Total	22								
2	Main stem	20	5.9	3-7	5.5	3-9				
	Plural stem	(6)								
	Coppicing stem	3					4	3-5	1.4	0.8-1.8
	Main s. + Copp.s									
	Dead stem									
	Total	23								
3	Main stem	21	6.3	4.5-9	5.8	3-10				
	Plural stem	(9)								
	Coppicing stem	2					7	4-10	0.6	0.5-0.7
	Main s. + Copp.s									
	Dead stem									
	Total	23								
4	Main stem	12	5.7	4-7	5.3	3-8				
	Plural stem	(8)								
	Coppicing stem	1					6		0.5	
	Main s. + Copp.s									
	Dead stem									
	Total	13								
5	Main stem	19	5.6	3.8-7.5	5.5	3-10				
	Plural stem	(5)								
	Coppicing stem	3					6	6-7	0.8	0.5-1.2
	Main s. + Copp.s									
	Dead stem									
	Total	22								
Mean total	Main stem	90	5.8	3-9	5.4	2-10				
	Plural stem	(35)								
	Coppicing stem	13					6	3-10	0.8	0.5-1.8
	Main s. + Copp.s									
	Dead stem									
	Total	103								

Table 28 Assessment of trial plantation

Tree species: Mukusi
Location: Nalusoko
Sowing year: 1962
Treatment: C

Survey line No.	Stem condition	Number of trees	Tree height (m)		DBH (cm)		Number of coppices per stock		Height of coppice (m)	
			Average	Range	Average	Range	Average	Range	Average	Range
1	Main stem	6	5.2	3.8-7	6.0	3-7				
	Plural stem	(1)								
	Coppicing stem	4					2	1-3	1.4	0.8-2.3
	Main s. + Copp. s									
	Dead stem									
	Total	10								
2	Main stem	6	5.2	4.3-6.4	5.7	4-9				
	Plural stem	(1)								
	Coppicing stem	1					7		2.5	
	Main s. + Copp. s									
	Dead stem									
	Total	7								
3	Main stem	7	5.4	4-6.2	5.2	2-9				
	Plural stem	(2)								
	Coppicing stem	2					3	2-3	1.3	0.8-1.8
	Main s. + Copp. s									
	Dead stem									
	Total	9								
4	Main stem	6	4.5	2.8-7	3.2	2-6				
	Plural stem	(4)								
	Coppicing stem	2					6	3-9	0.9	0.6-1.2
	Main s. + Copp. s									
	Dead stem									
	Total	8								
5	Main stem	5	4.7	3.8-6.5	4.7	2-7				
	Plural stem	(2)								
	Coppicing stem	5					4	3-9	1.0	0.5-2.2
	Main s. + Copp. s									
	Dead stem	1	1.5							
	Total	11								
Mean total	Main stem	30	5.0	2.8-7	5.0	2-9				
	Plural stem	(10)								
	Coppicing stem	14					4	1-9	1.4	0.5-2.3
	Main s. + Copp. s									
	Dead stem	1								
	Total	45								

Table 29 (1) Assessment of trial plantation

Tree species: Mukusi
Location: Dambwa local forest (Livingstone)
Sowing year: 1962

Survey line No.	Stem condition	Number of trees	Tree height (m)		DBH (cm)		Number of coppices per stock		Height of coppice (m)	
			Average	Range	Average	Range	Average	Range	Average	Range
1	Main stem	8	6.3	4.6-10	10.2	3.6-15				
	Plural stem									
	Coppicing stem	1					10		3.0	
	Main s. + Copp. s	(2)					7	1-13	2.6	2-3.2
	Dead stem									
	Total	9								
2	Main stem	13	5.1	1.3-8.4	8.8	1-17				
	Plural stem									
	Coppicing stem	1					13		2.4	
	Main s. + Copp. s									
	Dead stem									
	Total	14								
3	Main stem	7	5.7	5-6.4	10.4	7.18				
	Plural stem									
	Coppicing stem	5					12	8-17	2.7	1.5-3.8
	Main s. + Copp. s									
	Dead stem									
	Total	12								
4	Main stem	13	5.4	3.4-7.6	8.8	5-11				
	Plural stem									
	Coppicing stem	1					2		2.8	
	Main s. + Copp. s	(1)					1		1.4	
	Dead stem	14								
	Total									
5	Main stem	3	5.1	4.6-5.6	8.3	6-10				
	Plural stem									
	Coppicing stem	2					5	2-7	2.5	1.9-3
	Main s. + Copp. s									
	Dead stem									
	Total	5								

Table 29 (2) Assessment of trial plantation

Tree species: Mukusi
Location: Dambwa local forest (Livingstone)
Sowing year: 1962

Survey line No.	Stem condition	Number of trees	Tree height (m)		DBH (cm)		Number of coppices per stock		Height of coppice (m)	
			Average	Range	Average	Range	Average	Range	Average	Range
6	Main stem	8	5.1	3.8-8	7.4	3-13				
	Plural stem									
	Coppicing stem	2					9	7-11	1.8	1.3-2.2
	Main s. + Copp. s									
	Dead stem									
	Total	10								
7	Main stem	8	4.5	3-6.1	6.5	4-11				
	Plural stem									
	Coppicing stem	1					5		2.6	
	Main s. + Copp. s									
	Dead stem									
	Total	9								
8	Main stem	4	5.6	3.6-7.4	7.5	3-11				
	Plural stem									
	Coppicing stem	2					2	2	1.8	0.6-0.3
	Main s. + Copp. s									
	Dead stem									
	Total	6								
9	Main stem	15	4.9	1.7-7.6	7.6	1-14				
	Plural stem	(2)								
	Coppicing stem	1					2		1.0	0.7-1.3
	Main s. + Copp. s									
	Dead stem									
	Total	16								
10	Main stem	8	5.1	3.2-7.2	7.4	2-15				
	Plural stem									
	Coppicing stem									
	Main s. + Copp. s									
	Dead stem									
	Total	8								
Mean total	Main stem	87	5.3	1.3-10	8.3	1-18				
	Plural stem	(2)								
	Coppicing stem	16					6	1-17	2.7	0.7-3.8
	Main s. + Copp. s	(3)					6	1-13	2.0	1.4-3.2
	Dead stem									
	Total	103								

Table 30 (1) Assessment of trial plantation

Tree species: Mukwa
Location: Dambwa local forest (Livingstone)
Sowing year: 1962

Survey line No.	Stem condition	Number of trees	Tree height (m)		DBH (cm)		Number of coppices per stock		Height of coppice (m)	
			Average	Range	Average	Range	Average	Range	Average	Range
6	Main stem	8	5.1	3.8-8	7.4	3-13				
	Plural stem									
	Coppicing stem	2					9	7-11	1.8	1.3-2.2
	Main s. + Copp. s									
	Dead stem									
	Total	10								
7	Main stem	8	4.5	3-6.1	6.5	4-11				
	Plural stem									
	Coppicing stem	1					5		2.6	
	Main s. + Copp. s									
	Dead stem									
	Total	9								
8	Main stem	4	5.6	3.6-7.4	7.5	3-11				
	Plural stem									
	Coppicing stem	2					2	2	1.8	0.6-0.3
	Main s. + Copp. s									
	Dead stem									
	Total	6								
9	Main stem	15	4.9	1.7-7.6	7.6	1-14				
	Plural stem	(2)								
	Coppicing stem	1					2		1.0	0.7-1.3
	Main s. + Copp. s									
	Dead stem									
	Total	16								
10	Main stem	8	5.1	3.2-7.2	7.4	2-15				
	Plural stem									
	Coppicing stem									
	Main s. + Copp. s									
	Dead stem									
	Total	8								
Mean total	Main stem	87	5.3	1.3-10	8.3	1-18				
	Plural stem	(2)								
	Coppicing stem	16					6	1-17	2.7	0.7-3.8
	Main s. + Copp. s	(3)					6	1-13	2.0	1.4-3.2
	Dead stem									
	Total	103								

Table 30 (2) Assessment of trial plantation

Tree species: Mukwa
Location: Dambwa local forest (Livingstone)
Sowing year: 1962

Survey line No.	Stem condition	Number of trees	Tree height (m)		DBH (cm)		Number of coppices per stock		Height of coppice (m)	
			Average	Range	Average	Range	Average	Range	Average	Range
6	Main stem	6	5.6	1.7-10	8.3	2-18				
	Plural stem	(2)								
	Coppicing stem	1					8		1.5	
	Main s. + Copp. s									
	Dead stem									
	Total	7								
7	Main stem	3	7.7	3.5-10	21.3	14-26				
	Plural stem									
	Coppicing stem									
	Main s. + Copp. s									
	Dead stem									
	Total	3								
Mean total	Main stem	36	8.9	1.7-12	17.0	2-26				
	Plural stem	(7)								
	Coppicing stem	4					4	1-8	2.2	0.5-4.0
	Main s. + Copp. s									
	Dead stem									
	Total	40								