



**VILLAGE BY VILLAGE 2016/17 END OF DRY SEASON WOODLOTS ASSESSMENT
FEEDBACK REPORT**

August, 2017



United Republic of Tanzania
**MINISTRY OF NATURAL RESOURCES
AND TOURISM**
Forestry and Beekeeping Division



**EMBASSY OF FINLAND
DAR ES SALAAM**

Village by village 2016/17 end of dry season woodlots assessment

Feedback report

Private Forestry Programme – Panda Miti Kibiashara

Plot no.21, Block 1, Zone 1A

Gangilonga

P.O. Box 2244, Iringa.

www.privateforestry.or.tz

GUIDE TO READERS

- ✚ This compiled report provides results of individual village by village 2016/17 end of dry season survey feedback reports
- ✚ This villages' reports are arranged in alphabetical order for all 20 villages
- ✚ A summary for easy access of each individual villages reports is described in table below:

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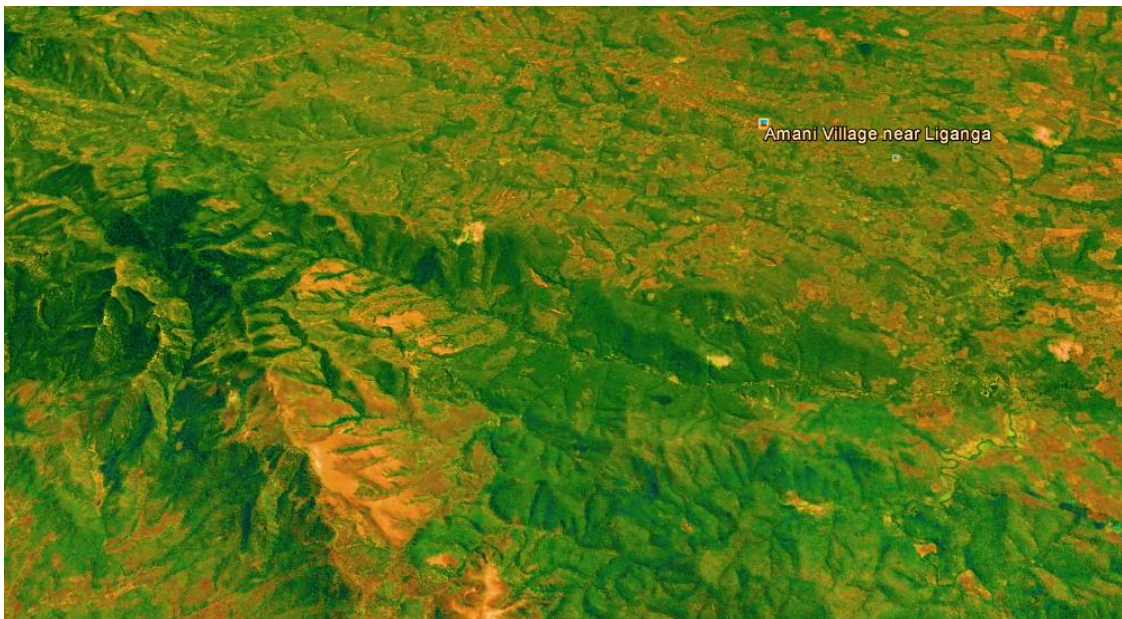
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Ng'elamo	227
Nhungu	241
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Utilili	286



End of Dry Season woodlot assessment 2016/17

End of Dry season survey feedback report for Amani village

June 2017, Iringa, Tanzania



United Republic of Tanzania
**MINISTRY OF NATURAL RESOURCES
AND TOURISM**
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ABBREVIATIONS

GPS	Global Positioning System
PFP	Private Forestry Programme
TGIS	Tree Growing Incentive Scheme

1. INTRODUCTION

1.1. Background

The Private Forestry Programme (PFP) is a Finnish funded development aid programme designed to run from 2014 to 2030. It increases wealth in the Southern Highlands by promoting commercial management of smallholder plantations and wood processing enterprises.

This field survey was carried out in 25 villages that have been supported in planting trees by PFP. The field work was done from December 2016 to February 2017. The purpose of the field work was to assess the performance and management of the woodlots. The results will be used by PFP to improve its support models in the future.

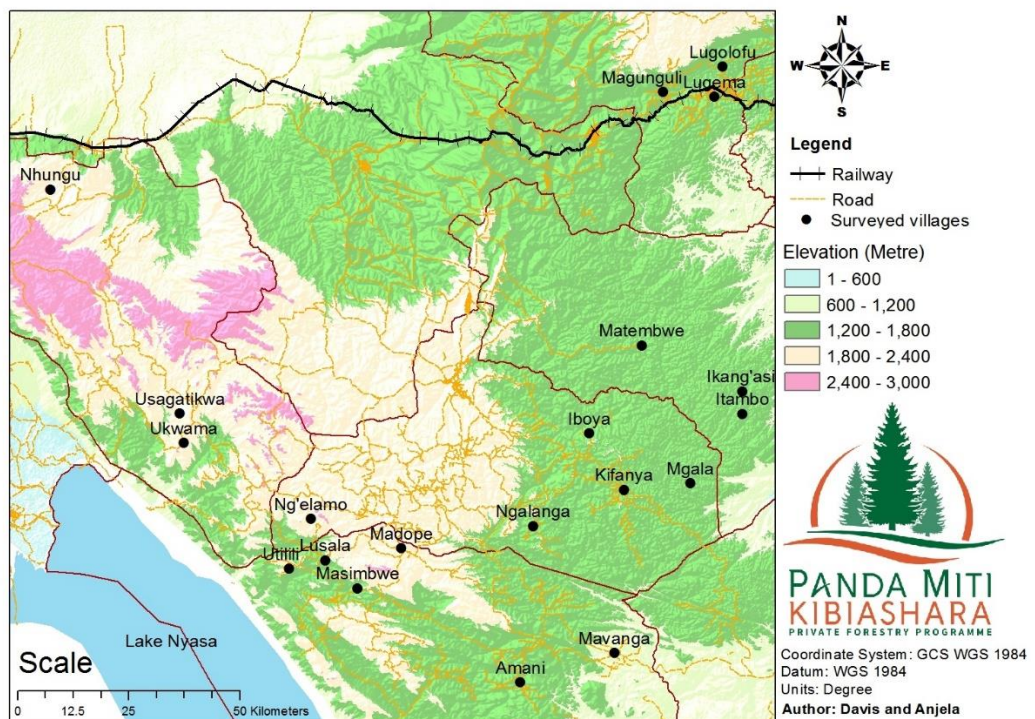
1.2. Objectives of the survey

- i. To assess the performance, survival, and level of management of the woodlots established through PFP support during the first two years of the programme.
- ii. To verify the status of the woodlots included in the PFP database.
- iii. To interview supported beneficiaries for collection of socioeconomic data.

2. LOCATION OF THE VILLAGE

Amani village is situated between latitude $10^{\circ} 15'$ south and longitude $34^{\circ} 45'$ east. The village is found in the south eastern highland areas of Ludewa district in Njombe region and it is characterised as wet intermediate agro ecological zone (Figure. 1). The elevation ranges between 661m to 2000m a.s.l. and the soil texture is clay silt and alluvial soils in the valley bottom areas.

Figure 1: A map showing the location of Amani village with respect to other surveyed villages



3. METHODOLOGY

3.1. Field procedures

The field teams conducted the following activities while surveying the woodlots:

- ✚ Navigating to the woodlots using GPS receiver and support from local TGA personnel
- ✚ Then, a rope of radius of 7.57m was used to define the boundary of a sample plot within the woodlot
- ✚ Within the sample plots, the number of live and dead seedlings were counted (Annex 1).
- ✚ Also the level of weeding was assessed as shown in Table 1
- ✚ Metal bar was inserted for the 2015/16 established woodlots, so that they can be found later with a metal detector if needed

Table 1 Classification for the level of weeding

Category/ Score	Title	Definition
0	No weeding done	There are practically no signs of weeding activities done during the past rainy season
1	Some weeding done, but not acceptably	There is clear evidence of weeding activities taken place during the past rainy season; however they have not been done sufficiently to ensure tree survival, good quality and good growth in the woodlot.
2	Weeding activities done acceptably	There are some shortcomings in the weeding activities, but the overall level is clearly sufficient to help ensure tree survival, good quality and good growth in the woodlot.
3	Weeding activities done completely	There are practically no signs of shortcomings, and all weeding activities appear to be conducted throughout the woodlot.

Key: The classification was reflected against the technical guidelines for circle and slash weeding as presented in the PFP TGIS guidelines. These require:

- Circle weeding: 50 cm radius to be cleared of weeds without damage to the tree in the middle.
- Slash weeding: all living weeds cut lower than 30 cm height.

It should be noted that no decisions of approval or disapproval for the level of weeding for support purposes were done in relation to this exercise.

3.2. Calculations and statistical analysis

- ✚ **Stand density (stems/ha):** the number of live trees plus number of dead trees in the sample plot, extended into a figure per hectare.
- ✚ **Survival percentage:** the share of live trees of the total number of trees in the sample plot.
- ✚ **Dominant height:** Average calculated from the two tallest tree heights measured in the sample plot. Assuming 3 x 3 m planting density, the figure represents the average height of the 100 tallest trees in a hectare.

3.3. Tools

- ✚ GPS receiver
- ✚ Smartphones installed with ODK collect tool
- ✚ PVC pipe and Rope of 7.57m radius
- ✚ Metal bar

4. RESULTS

4.1. Woodlots description

- ✚ A total of 41 woodlots owned by 39 beneficiaries surveyed (Table 2).
- ✚ The village surveyed woodlots comprised a total area of 160.67 acres supported by the programme through TGIS in kind (Table 2).

Table 2: Village total number and area of woodlots

Planting year/season	Beneficiaries	Number of woodlot	Total area (acres)
2015/16	Female	11	36.37
	Male	29	117.33
	Institution	1	6.97
Grand Total		41	160.67

4.2. Weeding

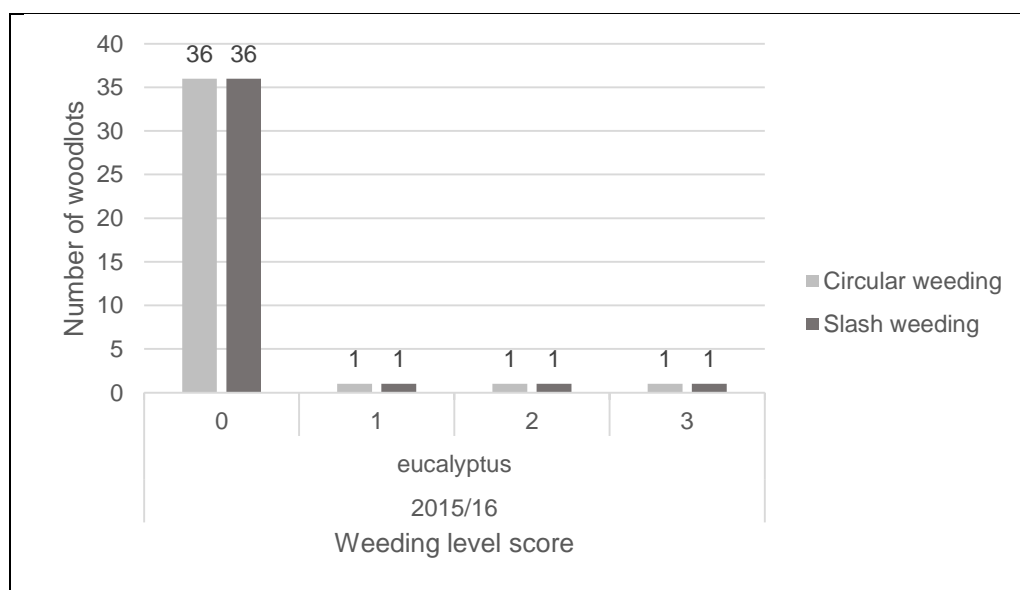
The observed score for both, circle and slash weeding were generally low (Table 3). The frequencies for assessed weeding scores are presented in Figure 2.

Table 3 Mean circle weeding and slash weeding scores by species group and year of stand establishment

Planting year/season	Beneficiaries	Specie group	CW	SW
2015/16	Female	Eucalyptus	0.27	0.27
	Male		0.11	0.26
	Institution		0.00	0.00
Grand Total			0.15	0.26

Key: CW = Circular weeding SW = Slash weeding

Figure 2: Mean circle weeding and slash weeding scores by woodlots



4.3. Survival and stocking

4.3.1. Fire damage

Generally, at village level fire was not a major problem affecting survival of the tree seedling. Although at individual woodlot level, fire seems to be a major concern for future development of the woodlots. In Amani village only one woodlot was affected by fire (Table 4) and only 13% survival score observed, hence mitigate measure are vital for sustainability of the woodlots.

Table 4: Description of the woodlot damaged by fire

S/N	Remarks	Number
1	Number of woodlots	1
2	Area (acres)	7.44

4.3.2. Height growth

Amani village mean dominant height was good as observed in Table 5.

Table 5: Mean dominant height description

Category	Description
Planting year/season	2015/16
Species group	Eucalyptus
Mean hdom (metres)	0.63

Key: hdom = Dominant height

4.3.3. Survival and stocking

Table 6 below shows the general survival percentage and mean stocking for Amani village. In general, the village average survival percentage was low, as compared to other villages (Table 7).

Table 6: Mean survival percentage description

Category	Description
Planting year/season	2015/16
Species group	Eucalyptus
Mean stocking (stem per hectare)	1115
Mean survival percentage	68%

Table 7: The rank of villages by average survival percentage

Village name	Average survival percentage	Rank
Matembwe	99%	1
Usagatikwa	95%	2
Kidabaga	95%	3
Lusala	90%	4
Kiyowela	89%	5
Ukwama	84%	6
Ngalanga	83%	7
Maguguli	83%	8
Madope	83%	9
Ng'elamo	82%	10
Kifanya	82%	11
Mavanga	82%	12
Ikang'asi	81%	13
Iboya	79%	14
Itambo	77%	15
Mgala	76%	16
Utilili	72%	17
Kiwalamo	72%	18
Lugema	70%	19
Lugolofu	69%	20
Amani	68%	21
Makungu	61%	22
Ukwega	59%	23
Masimbwe	54%	24
Nhungu	48%	25

4.4. Weeding

4.4.1. Circular weeding

Table 8 below shows the general circular weeding score for Amani village. In general, the village average circular weeding score was low as compared to other villages (Table 9).

Table 8: Mean circular weeding score description

Category	Description
Planting year/season	2015/16
Species group	Eucalyptus
WC	0.15

Key: WC = Circular weeding scores,

Table 9: The rank of villages by average circular weeding score

Villages	Average circular weeding score	Rank
Usagatikwa	1.84	1
Matembwe	1.45	2
Lugema	1.39	3
Lugolofu	1.20	4
Kiyowela	1.10	5
Maguguli	1.04	6
Kiwalamo	0.96	7
Ukwega	0.83	8
Iboya	0.83	9
Mgala	0.82	10
Nhungu	0.76	11
Mavanga	0.76	12
Ukwama	0.63	13
Lusala	0.60	14
Makungu	0.52	15
Kifanya	0.44	16
Kidabaga	0.33	17
Itambo	0.32	18
Ikang'asi	0.27	19
Ng'elamo	0.21	20
Amani	0.15	21
Utilili	0.15	22
Ngalanga	0.06	23
Madope	0.01	24
Masimbwe	0.00	25

4.4.2. Slash weeding

Table 10 below shows the general slash weeding score for Amani village. In general, the village average slash weeding score was low as compared to other villages (Table 11).

Table 10: Mean slash weeding score description

Category	Description
Planting year/season	2015/16
Species group	Eucalyptus
WS	0.26

Key: WS = Slash weeding score

Table 11: The rank of villages by average slash weeding score

Villages	Average slash weeding score	Rank
Kidabaga	2.00	1
Matembwe	1.73	2
Kiyowela	1.15	3
Mavanga	1.14	4
Lugema	1.11	5
Lusala	0.93	6
Maguguli	0.88	7
Kiwalamo	0.85	8
Ukwega	0.83	9
Makungu	0.76	10
Madope	0.66	11
Mgala	0.58	12
Usagatikwa	0.47	13
Kifanya	0.35	14
Lugolofu	0.35	15
Ukwama	0.34	16
Utilili	0.33	17
Ikang'asi	0.31	18
Itambo	0.30	19
Nhungu	0.27	20
Amani	0.26	21
Iboya	0.22	22
Ngalanga	0.11	23
Masimbwe	0.03	24
Ng'elamo	0.00	25

5. CONCLUSION AND RECOMMENDATION

Generally, the villagers are encouraged to increase effort in the woodlots management activities especially weeding, in order to obtain better survival, growth and quality of trees.

Results from the survey observed a slight correlation between weeding and survival percentage of the woodlots in Amani village. As described in Table 12, both, slash and circular weeding showed a negative and positive linear relationship to number of dead and live seedling respectively. This indicate that, woodlots with high weeding scores observed to have high number of live seedlings with less dead seedling.

Table 12: A correlation between weeding and survival score

Variable	Dead seedlings	Live seedlings
WC	-0.16	0.24
WS	-0.27	0.12

Key: WC = Circle weeding score WS = Slash weeding score

To some extent this information evaluate the need for weeding to increase survival percentage of the seedling in the woodlots. If both slash and circular weeding are done perfectly, then one could reduce the number of dead seedling and increase/maintain the number of live seedling in a particular woodlot. Scientifically weeding is proven to be vital for the survival of tree seedlings, since it reduces competition over nutrients, air and light between tree seedlings and weeds.

6. RESULTS FOR EACH INDIVIDUAL WOODLOT

Table 13 below shows the results for each individual beneficiary woodlots. It includes:

- ✚ Weeding score: both circular and slash weeding score
- ✚ Stem density (stem/ha)
- ✚ Survival percentage

Table 13: Village woodlots results

sRank	Pyear	Name	Gender	Area (acres)	Specie	WC	WS	Live	Dead	Total	Stock (stem/ha)	S-%	Hdom (metres)
1	2015/16	PAULO MLELWA	Male	11.61	eucalyptus	0	2	15	0	15	833	100%	1.05
2	2015/16	METHOD LUOGA	Male	17.05	eucalyptus	0	1	21	1	22	1222	95%	1.3
3	2015/16	KASTORY MBILINYI	Male	3.06	eucalyptus	0	0	20	1	21	1166	95%	0.75
4	2015/16	MARCO LUOGA	Male	1.63	eucalyptus	0	0	16	1	17	944	94%	1.15
5	2015/16	METHOD LUOGA	Male	7.22	eucalyptus	0	0	22	2	24	1333	92%	1.4
6	2015/16	ADO MLOWE	Male	1.83	eucalyptus	0	0	21	2	23	1278	91%	0.85
7	2015/16	ATHANASIO KOMBA	Male	3.06	eucalyptus	0	0	20	2	22	1222	91%	0.75
8	2015/16	HILORIMUS MLELWA	Male	3.02	eucalyptus	3	2	23	3	26	1444	88%	1.05
9	2015/16	FELIX MHAGAMA	Male	4.84	eucalyptus	0	0	29	4	33	1833	88%	0.55
10	2015/16	ILUMINATA MKINGA	Female	1.58	eucalyptus	2	0	15	3	18	1000	83%	1.2
11	2015/16	ELIZA MTITU	Female	5.44	eucalyptus	0	0	13	3	16	889	81%	1.05
12	2015/16	MELANIA KOMBA	Female	2.89	eucalyptus	0	0	19	5	24	1333	79%	0.5
13	2015/16	VINCENT KOMBA	Male	2.37	eucalyptus	0	0	20	6	26	1444	77%	0.45
14	2015/16	ANNA LUOGA	Female	3.16	eucalyptus	0	0	11	4	15	833	73%	1.8
15	2015/16	MUNDINDI SEC SCHOOL		6.97	eucalyptus	0	0	14	6	20	1111	70%	0.55
16	2015/16	JONISIA MLOWE	Female	1.51	eucalyptus	0	0	14	6	20	1111	70%	0.55
17	2015/16	GETRUDA LUOGA	Female	4.32	eucalyptus	0	2	12	6	18	1000	67%	1.05
18	2015/16	DENES KOMBA	Male	2.55	eucalyptus	0	0	14	7	21	1166	67%	0.65
19	2015/16	JENIPHER MLELWA	Female	4.37	eucalyptus	0	0	12	6	18	1000	67%	0.45
20	2015/16	BENEDICT LUOGA	Male	2.89	eucalyptus	0	0	12	6	18	1000	67%	1.25
21	2015/16	JOSEPH MLELWA	Male	2.15	eucalyptus	0	0	14	7	21	1166	67%	1.2
22	2015/16	AYUBU KOMBA	Male	2.79	eucalyptus	0	0	13	7	20	1111	65%	0.45
23	2015/16	ORESTO MWAGENI	Male	2.13	eucalyptus	0	0	7	4	11	611	64%	0.25
24	2015/16	DAUDI MBILINYI	Male	2.77	eucalyptus	0	0	8	5	13	722	62%	0.6
25	2015/16	ISSA LUOGA	Male	5.63	eucalyptus	0	2	9	6	15	833	60%	0.65

sRank	Pyear	Name	Gender	Area (acres)	Specie	WC	WS	Live	Dead	Total	Stock (stem/ha)	S-%	Hdom (metres)
26	2015/16	JENIPHER LUOGA	Female	2.55	eucalyptus	0	0	7	5	12	667	58%	0.3
27	2015/16	CHRISPIN MKINGA	Male	3.93	eucalyptus	0	0	16	12	28	1555	57%	0.5
28	2015/16	DEODATA MTITU	Female	4.84	eucalyptus	0	1	8	7	15	833	53%	0.35
29	2015/16	ELENESTA MHAGAMA	Female	2.74	eucalyptus	1	0	10	9	19	1055	53%	0.45
30	2015/16	JAMES KOMBA	Male	4.94	eucalyptus	0	0	9	9	18	1000	50%	1.05
31	2015/16	ELIA KOMBA	Male	2.15	eucalyptus	0	0	11	12	23	1278	48%	0.45
32	2015/16	MODESTA LUOGA P2	Female	2.97	eucalyptus	0	0	7	8	15	833	47%	0.6
33	2015/16	PETER MGIMBA	Male	2.37	eucalyptus	0	0	11	16	27	1500	41%	0.3
34	2015/16	WERNERY LUOGA	Male	2.15	eucalyptus	0	0	8	12	20	1111	40%	0.35
35	2015/16	JOHN KOMBA	Male	2.92	eucalyptus	0	0	7	14	21	1166	33%	0.75
36	2015/16	CRISPIN LUOGA	Male	2.87	eucalyptus	0	0	6	14	20	1111	30%	0.35
37	2015/16	GODFREY MWAJOMBE	Male	3.14	eucalyptus	0	0	5	15	20	1111	25%	0.5
38	2015/16	TOMASO HAULE	Male	1.14	eucalyptus			5	15	20	1111	25%	0.35
39	2015/16	MOI MHAGAMA	Male	1.83	eucalyptus	0	0	4	17	21	1166	19%	0.3
40	2015/16	PAULO MHAGAMA	Male	5.86	eucalyptus	0	0	3	20	23	1278	13%	0.3
41	2015/16	UFUNUO MHAGAMA	Male	7.44	eucalyptus			3	21	24	1333	13%	0.1

Key:

sRank	=	Rank based on survival score	Pyear	=	Planting year
Name	=	Woodlot owner first and last name	Area	=	Area of the woodlot in hectare
Specie	=	tree type (name)	WC	=	Circle weeding
WS	=	Slash weeding	Live	=	Alive seedling
Dead	=	Dead seedling	Total	=	Sum of seedling both dead and alive
Stock	=	Total number of seedling per hectare	s-%	=	Survival percentage
Sdeath	=	Score for dead seedling	hdom	=	Average height of two dominant (tallest) tree

Form Number:

Annex 1

1. WOODLOT ASSESSMENT FIELD SURVEY FORM

Surveyors: _____ Date: _____

WOODLOT LOCATION & OWNERSHIP

2. Coordinates by GPS

3. GPS accuracy

4. Village: _____ District: _____

5. Woodlot owner Name, Phone number and ID number (if applicable):

6. Has the woodlot changed owner since establishment? No / Yes / Unknown

If Yes, fill in the original owner: _____

PLOT MEASUREMENTS

7. Number of trees alive in the plot

8. Number of trees dead in the plot

9. Total number of trees in the plot

10. Height of the plot tallest tree (in decimetres): _____ dm, Second tallest tree: _____ dm

11. In case there are dead trees, assess the likely main cause of death:

Suppression by weeds

Cattle trampling:

Fire damage

Drought stress:

Disease

Other:

Insect damage

(specify "Other" in remarks)

GENERAL WOODLOT DATA

12. Species group: Pine / Eucalyptus / Teak

Scale: 0 – No weeding done
1 – Some weeding done, but not acceptably

13. Level of circle weeding in the woodlot: _____

14. Level of slash weeding in the woodlot: _____

2 – Weeding activities done acceptably
3 – Weeding activities done completely

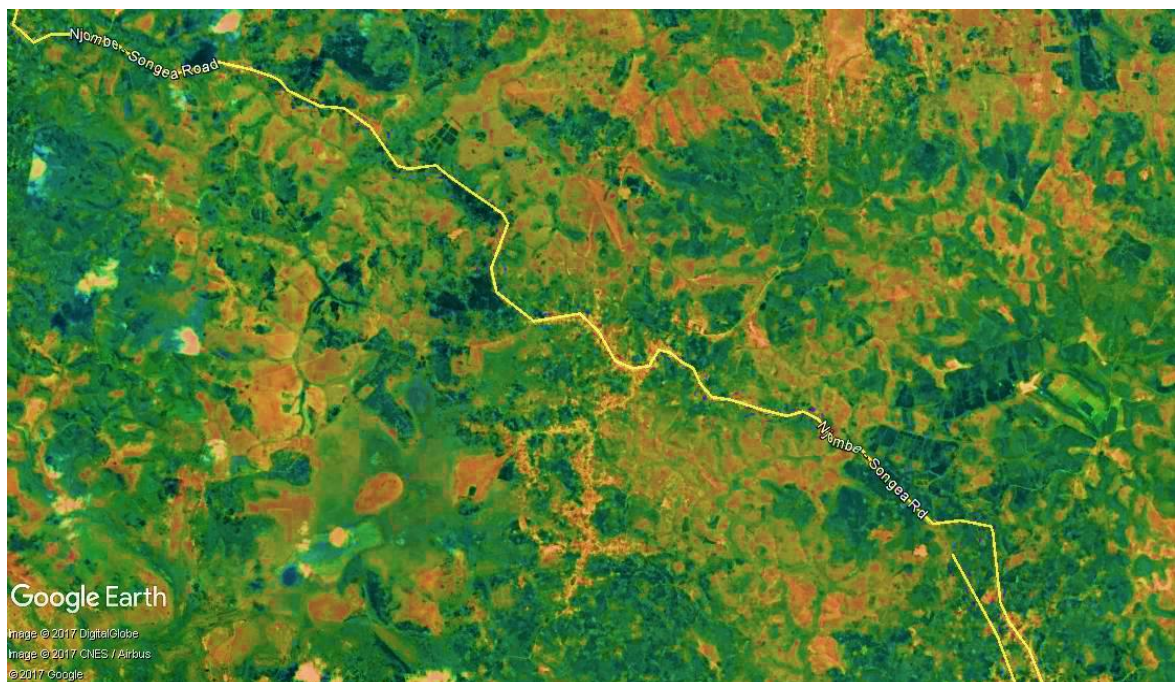
ADDITIONAL REMARKS BY SURVEYORS



End of Dry Season woodlot assessment 2016/17

End of Dry season survey feedback report for Iboya village

June 2017, Iringa, Tanzania



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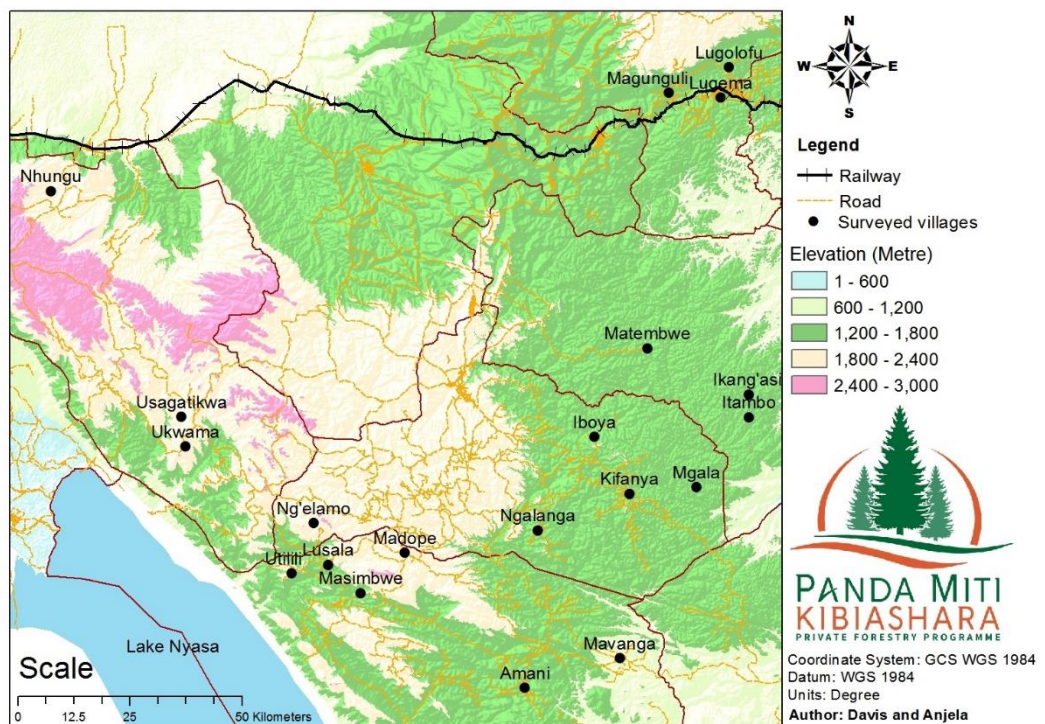
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- ii. To verify the status of the woodlots included in the PFP database.
- iii. To interview supported beneficiaries for collection of socioeconomic data.

2. LOCATION OF THE VILLAGE

Iboya village is situated between latitude 9° 19' south and longitude 34° 10' east. The village is found in the south eastern highland areas of Njombe town council in Njombe region (Figure. 1). The elevation ranges between 1600m to 1900m a.s.l.

Figure 3: A map showing the location of Iboya village with respect to other surveyed villages



3. METHODOLOGY

3.1. Field procedures

The field teams conducted the following activities while surveying the woodlots:

- ✚ Navigating to the woodlots using GPS receiver and support from local TGA personnel
- ✚ Then, a rope of radius of 7.57m was used to define the boundary of a sample plot within the woodlot
- ✚ Within the sample plots, the number of live and dead seedlings were counted (Annex 1).
- ✚ Also the level of weeding was assessed as shown in Table 1
- ✚ Metal bar was inserted for the 2015/16 established woodlots, so that they can be found later with a metal detector if needed.

Table 14 Classification for the level of weeding

Category/ Score	Title	Definition
0	No weeding done	There are practically no signs of weeding activities done during the past rainy season
1	Some weeding done, but not acceptably	There is clear evidence of weeding activities taken place during the past rainy season; however they have not been done sufficiently to ensure tree survival, good quality and good growth in the woodlot.
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It should be noted that no decisions of approval or disapproval for the level of weeding for support purposes were done in relation to this exercise.

3.2. Calculations and statistical analysis

- ✚ **Stand density (stems/ha):** the number of live trees plus number of dead trees in the sample plot, extended into a figure per hectare.
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3.3. Tools

- ✚ GPS receiver
- ✚ Smartphones installed with ODK collect tool
- ✚ PVC pipe and Rope of 7.57m radius
- ✚ Metal bar

4. RESULTS

4.1. Woodlots description

- A total of 126 woodlots owned by 46 beneficiaries surveyed (Table 2).
- The village surveyed woodlots comprised a total area of 847.7 acres supported by the programme through TGIS in kind (Table 2).

Table 15: Village total number and area of woodlots

Planting year/season	Beneficiaries	Number of woodlot	Total area (acres)
2014/15	Female	26	64.79
	Male	40	211.30
	Inst. &V.group	5	93.78
2015/16	Female	14	56.32
	Male	38	407.23
	Inst. &V.group	3	14.28
Grand Total		126	847.7

Key: Inst. &V.group = Institutions and vulnerable groups

4.2. Weeding

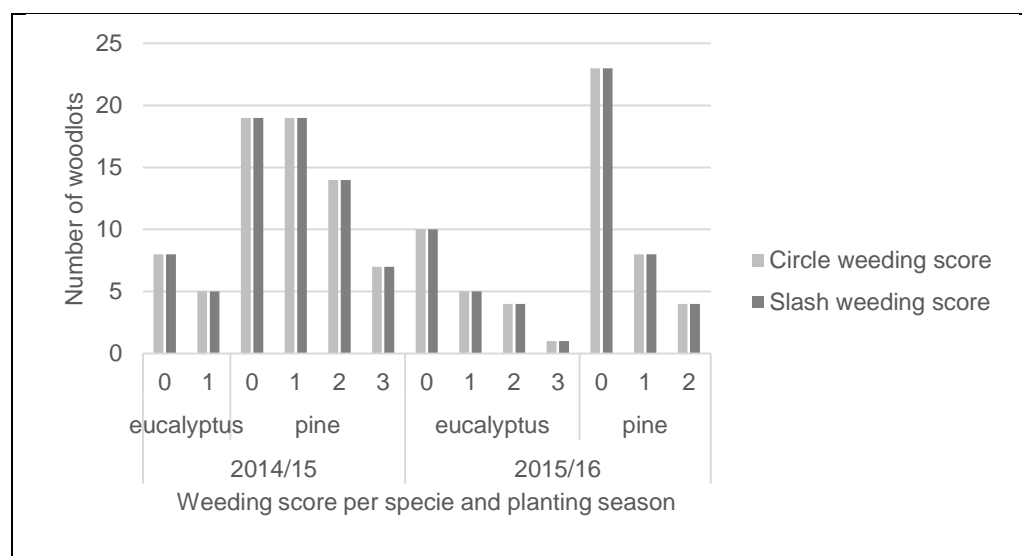
The observed score for both, circle and slash weeding were generally low (Table 3). The frequencies for assessed weeding scores are presented in Figure. 2.

Table 16 Mean circle weeding and slash weeding scores by specie group and year of stand establishment

Beneficiary	Specie group	Circle weeding		Slash weeding	
		2014/15	2015/16	2014/15	2015/16
Female	Pine	0.45	0.64	0.00	0.27
	Eucalyptus	0.17	0.67	0.00	0.00
Male	Pine	1.60	0.32	0.29	0.09
	Eucalyptus	0.50	0.88	0.00	0.50
Inst. &V.group	Pine	0.75	1.00	0.75	1.00
	Eucalyptus	1.00	0.00	0.00	0.00
Grand total		1.01	0.58	0.18	0.27

Key: Inst. &V.group = Institutions and vulnerable groups

Figure 4: Mean circle weeding and slash weeding scores by woodlots



4.3. Survival and stocking

4.3.1. Fire damage

Generally, at village level fire was not a major problem affecting survival of the tree seedling. Although at individual woodlot level, fire seems to be a major concern for future development of the woodlots. In Iboya village two woodlots were affected by fire (Table 4) hence mitigate measure are vital for sustainability of the woodlots.

Table 17: Description of the woodlot damaged by fire

S/N	Remarks	Number
1	Number of woodlots	2
2	Area (acres)	11.56

4.3.2. Height growth

Iboya village mean dominant height was good as observed in Table 5.

Table 18: Mean dominant height description

Specie group	hdom (metre)	
	2014/15	2015/16
Pines	10.28	5.57
Eucalyptus	11.92	6.75
Grand total	10.58	6.00

Key: hdom = Dominant height

4.3.3. Survival and stocking

Table 6 below shows the general survival percentage and mean stocking for Iboya village. In general, the village average survival percentage was low, as compared to other villages (Table 7).

Table 19: Mean survival percentage description

Specie group	2014/15		2015/16	
	S-%	Stock (stem/ha)	S-%	Stock (stem/ha)
Pines	79	1058	76	930
Eucalyptus	83	1017	83	1086
Grand total	79	1051	78	987

Key: S-% = Survival percentage

Table 20: The rank of villages by average survival percentage

Village name	Average survival percentage	Rank
Matembwe	99%	1
Usagatikwa	95%	2
Kidabaga	95%	3
Lusala	90%	4
Kiyowela	89%	5
Ukwama	84%	6
Ngalanga	83%	7
Maguguli	83%	8
Madope	83%	9
Ng'elamo	82%	10
Kifanya	82%	11
Mavanga	82%	12
Ikang'asi	81%	13
Iboya	79%	14
Itambo	77%	15
Mgala	76%	16
Utilili	72%	17
Kiwalamo	72%	18
Lugema	70%	19
Lugolofu	69%	20
Amani	68%	21
Makungu	61%	22
Ukwega	59%	23
Masimbwe	54%	24
Nhungu	48%	25

4.4. Weeding

4.4.1. Circular weeding

Table 8 below shows the general circular weeding score for Iboya village. In general, the village average circular weeding score was low as compared to other villages (Table 9).

Table 21: Mean circular weeding score description

Specie group	Circle weeding score	
	2014/15	2015/16
Pines	1.15	0.46
Eucalyptus	0.38	0.80
Grand total	1.01	0.58

Table 22: The rank of villages by average circular weeding score

Villages	Average circular weeding score	Rank
Usagatikwa	1.84	1
Matembwe	1.45	2
Lugema	1.39	3
Lugolofu	1.20	4
Kiyowela	1.10	5
Maguguli	1.04	6
Kiwalamo	0.96	7
Ukwega	0.83	8
Iboya	0.83	9
Mgala	0.82	10
Nhungu	0.76	11
Mavanga	0.76	12
Ukwama	0.63	13
Lusala	0.60	14
Makungu	0.52	15
Kifanya	0.44	16
Kidabaga	0.33	17
Itambo	0.32	18
Ikang'asi	0.27	19
Ng'elamo	0.21	20
Amani	0.15	21
Utilili	0.15	22
Ngalanga	0.06	23
Madope	0.01	24
Masimbwe	0.00	25

4.4.2. Slash weeding

Table 10 below shows the general slash weeding score for Iboya village. In general, the village average slash weeding score was low as compared to other villages (Table 11).

Table 23: Mean slash weeding score description

Specie group	Slash weeding score	
	2014/15	2015/16
Pines	0.22	0.20
Eucalyptus	0.00	0.40
Grand total	0.22	0.30

Table 24: The rank of villages by average slash weeding score

Villages	Average slash weeding score	Rank
Kidabaga	2.00	1
Matembwe	1.73	2
Kiyowela	1.15	3
Mavanga	1.14	4
Lugema	1.11	5
Lusala	0.93	6
Maguguli	0.88	7
Kiwalamo	0.85	8
Ukwega	0.83	9
Makungu	0.76	10
Madope	0.66	11
Mgala	0.58	12
Usagatikwa	0.47	13
Kifanya	0.35	14
Lugolofu	0.35	15
Ukwama	0.34	16
Utilili	0.33	17
Ikang'asi	0.31	18
Itambo	0.30	19
Nhungu	0.27	20
Amani	0.26	21
Iboya	0.22	22
Ngalanga	0.11	23
Masimbwe	0.03	24
Ng'elamo	0.00	25

5. CONCLUSION AND RECOMMENDATION

Generally, the villagers are encouraged to increase effort in the woodlots management activities especially weeding, in order to obtain better survival, growth and quality of trees.

Results from the survey observed a slight correlation between the weeding and survival percentage of the woodlots in Iboya village. As described in Table 12, both, slash and circular weeding showed a negative and positive linear relationship to number of dead and live seedling respectively. This indicate that, woodlots with high weeding scores observed to have high number of live seedlings with less dead seedling.

Table 25: A correlation between weeding and survival score

Variable	Dead seedlings	Live seedlings
WC	-0.042	0.136
WS	-0.14	0.105

Key: WC = Circle weeding score WS = Slash weeding score

To some extent this information evaluate the need for weeding to increase survival percentage of the seedling in the woodlots. If both slash and circular weeding are done perfectly, then one could reduce the number of dead seedling and increase/maintain the number of live seedling in a particular woodlot. Scientifically weeding is proven to be vital for the survival of tree seedlings, since it reduces competition over nutrients, air and light between tree seedlings and weeds.

6. RESULTS FOR EACH INDIVIDUAL WOODLOT

Table 13 below shows the results for each individual beneficiary woodlots. It includes:

- ✚ Weeding score: both circular and slash weeding score
- ✚ Stem density (stem/ha)
- ✚ Survival percentage

Table 26: Village woodlots results

sRank	Pyear	Name	Gender	Area	Specie	WC	WS	Live	Dead	Total	Stock	S-%	Hdom
1	2014/15	EDITHA LUWAWILO	Female	3.16	pine	1	0	20	0	20	1111	100%	1.1
2	2015/16	AURELIA MNGQNGO	Female	2.20	pine	1	1	12	0	12	667	100%	0.65
3	2015/16	YELEMIAS MALEKELA	Male	2.35	pine	0	0	14	0	14	778	100%	0.25
4	2015/16	JOHN MNG'ONG'O	Male	3.34	pine	0	0	9	0	9	500	100%	1.45
5	2015/16	NOLASCO KIMENA	Male	5.51	pine	0	0	8	0	8	444	100%	0.55
6	2014/15	ONESMO MNGONGO	Male	0.62	pine	2	1	19	0	19	1055	100%	1.3
7	2015/16	DEOCALA MAMBA	Female	3.56	pine	1	0	18	0	18	1000	100%	0.6
8	2014/15	HILDA KIMENA	Female	1.53	pine	1	0	17	0	17	944	100%	1
9	2014/15	RICHARD CHATANDA	Male	1.06	eucalyptus	0	0	6	0	6	333	100%	2.15
10	2015/16	KANISIA MAPILE	Female	9.37	pine	1	0	19	0	19	1055	100%	1
11	2014/15	ESSIO MPETE	Male	2.25	pine	1	0	24	0	24	1333	100%	1.3
12	2014/15	ESSIO MPETE	Male	2.25	pine	3	2	18	0	18	1000	100%	1.55
13	2014/15	ESSIO MPETE	Male	2.25	pine	3	1	18	0	18	1000	100%	1.55
14	2015/16	YONA CHAULA	Male	46.26	eucalyptus	3	3	22	0	22	1222	100%	1.3
15	2015/16	YONA CHAULA	Male	46.26	eucalyptus	1	0	19	0	19	1055	100%	0.45
16	2015/16	YONA CHAULA	Male	46.26	eucalyptus	0	0	21	0	21	1166	100%	2.35
17	2014/15	VERONICA WELLA	Female	2.13	pine	0	0	16	0	16	889	100%	1.15
18	2015/16	ELIAS MNG'ONG'O	Male	3.29	eucalyptus	2	1	25	0	25	1389	100%	0.65
19	2014/15	ELIAS MNG'ONG'O	Male	3.29	pine	3	0	22	0	22	1222	100%	1.55
20	2014/15	PETER MNGONGO	Male	2.57	pine	2	0	22	0	22	1222	100%	0.95
21	2015/16	PETER MNGONGO	Male	2.57	eucalyptus	0	0	19	0	19	1055	100%	1.1
22	2015/16	ALDO KABONGE	Male	8.15	eucalyptus	0	0	16	0	16	889	100%	0.35
23	2014/15	VULNERABLE GROUP		27.45	pine	3	1	16	0	16	889	100%	1.05
24	2014/15	VULNERABLE GROUP		27.45	pine	0	2	18	0	18	1000	100%	0.55
25	2014/15	YELEMIAS MALEKELA	Male	2.35	pine	2	0	21	1	22	1222	95%	1.1

sRank	Pyear	Name	Gender	Area	Specie	WC	WS	Live	Dead	Total	Stock	S-%	Hdom
26	2014/15	YELEMIAS MALEKELA	Male	2.35	pine	2	0	21	1	22	1222	95%	1.1
27	2014/15	SUSANA MBAWALA	Female	1.88	pine	0	0	21	1	22	1222	95%	1.2
28	2014/15	SUSANA MBAWALA	Female	1.88	pine	0	0	21	1	22	1222	95%	1.2
29	2014/15	EMANUEL LUHAMBTI	Male	3.56	pine	1	0	18	1	19	1055	95%	1.3
30	2015/16	KANISIA MAPILE	Female	9.37	pine	0	0	18	1	19	1055	95%	0.55
31	2014/15	YONA CHAULA	Male	46.26	eucalyptus	0	0	18	1	19	1055	95%	0.45
32	2014/15	KOLETA MSESE	Female	2.74	eucalyptus	0	0	17	1	18	1000	94%	0.55
33	2015/16	IBOYA PRIMARY SCHOOL		2.87	pine	2	2	17	1	18	1000	94%	0.85
34	2014/15	VULNERABLE GROUP		27.45	eucalyptus	1	0	17	1	18	1000	94%	0.75
35	2014/15	NOLASCO KIMENA	Male	5.51	pine	0	0	16	1	17	944	94%	1.05
36	2014/15	ESSIO MPETE	Male	2.25	pine	0	0	16	1	17	944	94%	0.75
37	2014/15	NOLASCO KIMENA	Male	5.51	pine	1	0	15	1	16	889	94%	0.25
38	2015/16	YONA CHAULA	Male	46.26	eucalyptus	2	0	15	1	16	889	94%	0.45
39	2014/15	YONA CHAULA	Male	46.26	eucalyptus	0	0	27	2	29	1611	93%	4.9
40	2014/15	MARIO LYANZILE	Male	3.68	pine	1	0	13	1	14	778	93%	0.7
41	2014/15	VERONICA WELLA	Female	2.13	pine	1	0	12	1	13	722	92%	0.3
42	2015/16	PASIANI MAPILE	Male	3.01	pine	0	0	11	1	12	667	92%	0.25
43	2014/15	AGNES MNGONGO	Female	2.79	eucalyptus	0	0	10	1	11	611	91%	1
44	2015/16	JOHN MNG'ONG'O	Male	3.34	eucalyptus	0	2	18	2	20	1111	90%	1.55
45	2014/15	JOHN MNG'ONG'O	Male	3.34	pine	1	0	18	2	20	1111	90%	1.05
46	2015/16	HILDA KIMENA	Female	1.53	pine	0	0	18	2	20	1111	90%	0.35
47	2014/15	PEREPETUA LUWAWILO	Female	1.88	pine	1	0	17	2	19	1055	89%	1.05
48	2015/16	NOLASCO KIMENA	Male	5.51	pine	0	0	17	2	19	1055	89%	1.15
49	2015/16	NOLASCO KIMENA	Male	5.51	pine	0	0	17	2	19	1055	89%	1.15
50	2014/15	ONESMO MNGONGO	Male	0.62	pine	3	1	17	2	19	1055	89%	0.7
51	2014/15	AURELIA MNGQNGO	Female	2.20	pine	0	0	16	2	18	1000	89%	1.05

sRank	Pyear	Name	Gender	Area	Specie	WC	WS	Live	Dead	Total	Stock	S-%	Hdom
52	2015/16	PASIANSI MAPILE	Male	3.01	pine	1	0	16	2	18	1000	89%	0.4
53	2014/15	PASKALI KIMENA	Male	3.58	eucalyptus	1	0	16	2	18	1000	89%	0.65
54	2015/16	PASKALI KIMENA	Male	3.58	eucalyptus	1	0	16	2	18	1000	89%	0.65
55	2015/16	ELETERIUS MAKINDA	Male	3.39	pine	0	0	23	3	26	1444	88%	0.6
56	2015/16	ARON MAKINDA	Male	1.88	pine	0	0	14	2	16	889	88%	0.5
57	2015/16	YONA CHAULA	Male	46.26	eucalyptus	1	0	14	2	16	889	88%	0.6
58	2014/15	JOHN MNG'ONG'O	Male	3.34	pine	2	2	20	3	23	1278	87%	0.75
59	2015/16	EUSTAKIA LUWAWILO	Female	2.55	pine	1	0	13	2	15	833	87%	0.9
60	2015/16	NOLASCO KIMENA	Male	5.51	pine	2	0	13	2	15	833	87%	0.25
61	2014/15	GRACE MAMBA	Female	2.27	pine	0	0	18	3	21	1166	86%	1.2
62	2014/15	GRACE MAMBA	Female	2.27	pine	0	0	18	3	21	1166	86%	1.2
63	2014/15	JOSEPH MNG'ONG'O	Male	6.77	eucalyptus	1	0	18	3	21	1166	86%	0.7
64	2014/15	AGNES MNGONGO	Female	2.79	pine	0	0	18	3	21	1166	86%	0.95
65	2015/16	PASIANSI MAPILE	Male	3.01	pine	0	0	12	2	14	778	86%	0.35
66	2015/16	JOHN MNG'ONG'O	Male	3.34	pine	0	0	5	1	6	333	83%	1.65
67	2015/16	NOLASCO KIMENA	Male	5.51	pine	2	2	10	2	12	667	83%	0.35
68	2015/16	YONA CHAULA	Male	46.26	eucalyptus	2	1	15	3	18	1000	83%	0.25
69	2015/16	EMANUEL LUHAMBTI	Male	3.56	eucalyptus	1	0	33	7	40	2222	83%	0.5
70	2014/15	NOLASCO KIMENA	Male	5.51	pine	2	1	14	3	17	944	82%	0.35
71	2015/16	AGNES MNGONGO	Female	2.79	eucalyptus	2	0	18	4	22	1222	82%	0.3
72	2014/15	PASIANSI MAPILE	Male	3.01	pine	2	0	18	4	22	1222	82%	0.75
73	2014/15	BEATHA MAPILE	Female	2.42	pine	2	0	13	3	16	889	81%	1.05
74	2015/16	GRACE MAMBA	Female	2.27	pine	0	0	13	3	16	889	81%	0.25
75	2014/15	EDITHA LUWAWILO	Female	3.16	eucalyptus	0	0	15	4	19	1055	79%	0.7
76	2014/15	EDITHA LUWAWILO	Female	3.16	eucalyptus	0	0	15	4	19	1055	79%	0.7
77	2015/16	EXAVERY CHATANDA	Male	9.86	pine	0	0	15	4	19	1055	79%	0.25

sRank	Pyear	Name	Gender	Area	Specie	WC	WS	Live	Dead	Total	Stock	S-%	Hdom
78	2015/16	ILOWOLA SCHOOL		5.71	pine	0	0	26	7	33	1833	79%	0.65
79	2014/15	ILOWOLA SCHOOL		5.71	pine	0	0	26	7	33	1833	79%	0.65
80	2014/15	STELLA MAMBA	Female	2.47	pine	0	0	11	3	14	778	79%	1.1
81	2014/15	STELLA MAMBA	Female	2.47	pine	0	0	11	3	14	778	79%	1.1
82	2014/15	DEOCALA MAMBA	Female	3.56	pine	0	0	18	5	23	1278	78%	0.6
83	2014/15	ARON MAKINDA	Male	1.88	pine	1	0	15	5	20	1111	75%	0.8
84	2014/15	ELIAS MNG'ONG'O	Male	3.29	pine	0	0	15	5	20	1111	75%	0.9
85	2015/16	EDWARD LUWAWILO	Male	2.64	eucalyptus	1	1	11	4	15	833	73%	0.35
86	2015/16	MARIO LYANZILE	Male	3.68	pine	0	0	11	4	15	833	73%	0.95
87	2014/15	NOLASCO KIMENA	Male	5.51	eucalyptus	1	0	22	8	30	1666	73%	1.3
88	2015/16	REGINA MALEKELA	Female	3.41	pine	1	0	11	4	15	833	73%	0.65
89	2014/15	RICHARD CHATANDA	Male	1.06	pine	1	0	13	5	18	1000	72%	1.1
90	2015/16	RICHARD CHATANDA	Male	1.06	pine	0	0	10	4	14	778	71%	0.35
91	2014/15	ELETERIUS MAKINDA	Male	3.39	pine	0	0	12	5	17	944	71%	1.05
92	2015/16	ANANIAS LYANZILE	Male	2.45	eucalyptus	0	0	14	6	20	1111	70%	0.4
93	2015/16	ANANIAS LYANZILE	Male	2.45	eucalyptus	0	0	14	6	20	1111	70%	0.4
94	2014/15	SESILIA KIBIKI	Female	2.52	pine	1	0	14	6	20	1111	70%	0.95
95	2015/16	NESTOR LIANZILE	Male	5.14	pine	0	0	11	5	16	889	69%	0.35
96	2014/15	ILOWOLA SCHOOL		5.71	pine	0	0	11	5	16	889	69%	1.1
97	2014/15	NESTOR LIANZILE	Male	5.14	pine	2	1	13	6	19	1055	68%	0.9
98	2014/15	EUSTAKIA LUWAWILO	Female	2.55	pine	1	0	12	6	18	1000	67%	0.85
99	2014/15	PASKALI KIMENA	Male	3.58	pine	1	0	10	5	15	833	67%	0.6
100	2015/16	VERONICA WELLA	Female	2.13	eucalyptus	0	0	6	3	9	500	67%	0.9
101	2015/16	ILOWOLA SCHOOL		5.71	eucalyptus	0	0	13	7	20	1111	65%	0.2
102	2014/15	PETER MNGONGO	Male	2.57	pine	2	0	11	6	17	944	65%	0.75
103	2014/15	PETER MNGONGO	Male	2.57	pine	1	0	11	6	17	944	65%	0.8

sRank	Pyear	Name	Gender	Area	Specie	WC	WS	Live	Dead	Total	Stock	S-%	Hdom
104	2015/16	NOLASCO KIMENA	Male	5.51	eucalyptus	0	0	9	5	14	778	64%	0.3
105	2014/15	KOLETA MSESE	Female	2.74	pine	1	0	13	8	21	1166	62%	0.75
106	2014/15	GRACE MAMBA	Female	2.27	eucalyptus	1	0	14	9	23	1278	61%	0.95
107	2014/15	MARIO LYANZILE	Male	3.68	pine	1	0	12	9	21	1166	57%	0.8
108	2014/15	CHARLES KIHEGULO	Male	1.93	pine	3	0	13	10	23	1278	57%	0.75
109	2014/15	CHRISTOPHER CHATANDA	Male	2.20	pine	2	0	9	7	16	889	56%	0.85
110	2014/15	EDWARD LUWAWILO	Male	2.64	pine	2	0	9	8	17	944	53%	0.7
111	2015/16	PETER MNGONGO	Male	2.57	pine	0	0	10	9	19	1055	53%	0.4
112	2015/16	KANISIA MAPILE	Female	9.37	eucalyptus	0	0	11	10	21	1166	52%	0.45
113	2015/16	JOHN MNG'ONG'O	Male	3.34	pine	0	0	12	11	23	1278	52%	0.3
114	2014/15	JOHN MNG'ONG'O	Male	3.34	pine	1	0	10	10	20	1111	50%	0.65
115	2015/16	KOLETA MSESE	Female	2.74	pine	0	0	9	11	20	1111	45%	0.3
116	2014/15	SUSANA MBAWALA	Female	1.88	eucalyptus	0	0	3	4	7	389	43%	0.7
117	2014/15	JOHN MNG'ONG'O	Male	3.34	pine	3	1	8	11	19	1055	42%	0.65
118	2014/15	JOHN MNG'ONG'O	Male	3.34	pine	2	0	8	11	19	1055	42%	6.5
119	2015/16	MARIO LYANZILE	Male	3.68	pine	0	0	6	11	17	944	35%	0.25
120	2015/16	EDITHA LUWAWILO	Female	3.16	pine	2	2	6	12	18	1000	33%	0.3
121	2014/15	MARIO LYANZILE	Male	3.68	pine	1	0	6	12	18	1000	33%	0.45
122	2015/16	SUSANA MBAWALA	Female	1.88	pine	0	0	4	10	14	778	29%	0.2
123	2015/16	JOHN MNG'ONG'O	Male	3.34	pine	1	0	6	16	22	1222	27%	0.3
124	2014/15	REGINA MALEKELA	Female	3.41	pine	0	0	5	16	21	1166	24%	0.75
125	2015/16	LEONATH MAMBA	Male	8.60	pine	1	0	1	15	16	889	6%	0.2
126	2014/15	SESILIA KIBIKI	Female	2.52	pine	0	0	0	18	18	1000	0%	

Key:

sRank = Rank based on survival score
Name = Woodlot owner first and last name
Specie = tree type (name)
WS = Slash weeding
Dead = Dead seedling
Stock = Total number of seedling per hectare
Sdeath = Score for dead seedling

Pyear = Planting year
Area = Area of the woodlot in hectare
WC = Circle weeding
Live = Alive seedling
Total = Sum of seedling both dead and alive
s-% = Survival percentage
hdom = Average height of two dominant (tallest) tree

Form Number:

Annex 1

15. WOODLOT ASSESSMENT FIELD SURVEY FORM

Surveyors: _____ Date: _____

WOODLOT LOCATION & OWNERSHIP

16. Coordinates by GPS

17. GPS accuracy

18. Village: _____ District: _____

19. Woodlot owner Name, Phone number and ID number (if applicable):

20. Has the woodlot changed owner since establishment? No / Yes / Unknown

If Yes, fill in the original owner: _____

PLOT MEASUREMENTS

21. Number of trees alive in the plot

22. Number of trees dead in the plot

23. Total number of trees in the plot

24. Height of the plot tallest tree (in decimetres): _____ dm, Second tallest tree: _____ dm

25. In case there are dead trees, assess the likely main cause of death:

Suppression by weeds

Cattle trampling:

Fire damage

Drought stress:

Disease

Other:

Insect damage

(specify "Other" in remarks)

GENERAL WOODLOT DATA

26. Species group: Pine / Eucalyptus / Teak

Scale: 0 – No weeding done
1 – Some weeding done, but not acceptably

27. Level of circle weeding in the woodlot: _____

28. Level of slash weeding in the woodlot: _____

2 – Weeding activities done acceptably
3 – Weeding activities done completely

ADDITIONAL REMARKS BY SURVEYORS



End of Dry Season woodlot assessment 2016/17

End of Dry season survey feedback report for Ikang'asi village

June 2017, Iringa, Tanzania

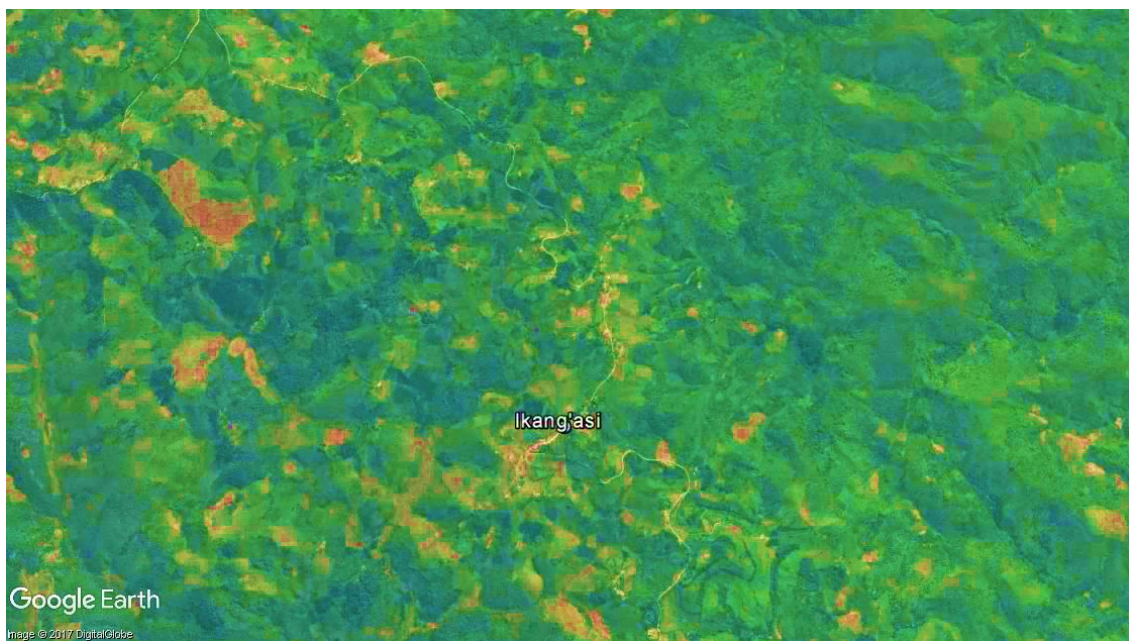


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LIST OF ANNEXES

Annex 1: Woodlot assessment field survey form

ABBREVIATIONS

GPS Global Positioning System
PFP Private Forestry Programme
TGIS Tree Growing Incentive Scheme

1. INTRODUCTION

1.1. Background

The Private Forestry Programme (PFP) is a Finnish funded development aid programme designed to run from 2014 to 2030. It increases wealth in the Southern Highlands by promoting commercial management of smallholder plantations and wood processing enterprises.

This field survey was carried out in 25 villages that have been supported in planting trees by PFP. The field work was done from December 2016 to February 2017. The purpose of the field work was to assess the performance and management of the woodlots. The results will be used by PFP to improve its support models in the future.

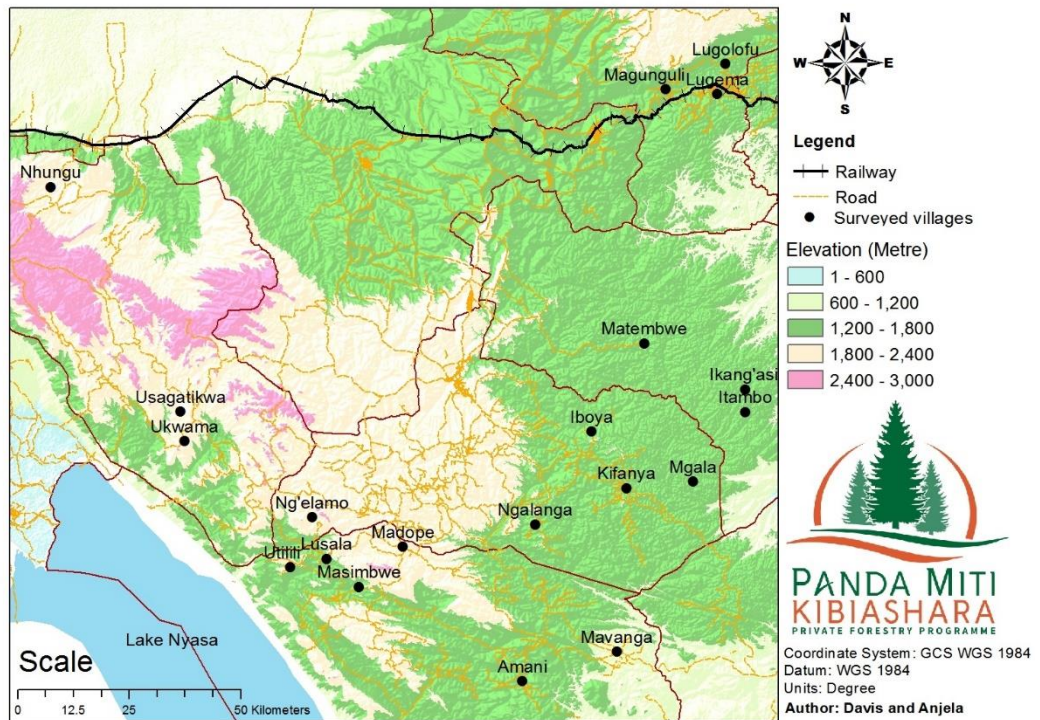
1.2. Objectives of the survey

- i. To assess the performance, survival, and level of management of the woodlots established through PFP support during the first two years of the programme.
- ii. To verify the status of the woodlots included in the PFP database.
- iii. To interview supported beneficiaries for collection of socioeconomic data.

2. LOCATION OF THE VILLAGE

Ikang'asi village is situated between latitude 9° 20' south and longitude 35° 20' east. The village is found in the south highland areas of Njombe district council in Njombe region (Figure. 1). The elevation ranges between 1200m to 1600m a.s.l.

Figure 5: A map showing the location of Ikang'asi village with respect to other surveyed villages



3. METHODOLOGY

3.1. Field procedures

The field teams conducted the following activities while surveying the woodlots:

- ✚ Navigating to the woodlots using GPS receiver and support from local TGA personnel
- ✚ Then, a rope of radius of 7.57m was used to define the boundary of a sample plot within the woodlot
- ✚ Within the sample plots, the number of live and dead seedlings were counted (Annex 1).
- ✚ Also the level of weeding was assessed as shown in Table 1
- ✚ Metal bar was inserted for the 2015/16 established woodlots, so that they can be found later with a metal detector if needed.

Table 27 Classification for the level of weeding

Category/ Score	Title	Definition
0	No weeding done	There are practically no signs of weeding activities done during the past rainy season
1	Some weeding done, but not acceptably	There is clear evidence of weeding activities taken place during the past rainy season; however they have not been done sufficiently to ensure tree survival, good quality and good growth in the woodlot.
2	Weeding activities done acceptably	There are some shortcomings in the weeding activities, but the overall level is clearly sufficient to help ensure tree survival, good quality and good growth in the woodlot.
3	Weeding activities done completely	There are practically no signs of shortcomings, and all weeding activities appear to be conducted throughout the woodlot.

Key: The classification was reflected against the technical guidelines for circle and slash weeding as presented in the PFP TGIS guidelines. These require:

- Circle weeding: 50 cm radius to be cleared of weeds without damage to the tree in the middle.
- Slash weeding: all living weeds cut lower than 30 cm height.

It should be noted that no decisions of approval or disapproval for the level of weeding for support purposes were done in relation to this exercise.

3.2. Calculations and statistical analysis

- ✚ **Stand density (stems/ha):** the number of live trees plus number of dead trees in the sample plot, extended into a figure per hectare.
- ✚ **Survival percentage:** the share of live trees of the total number of trees in the sample plot.
- ✚ **Dominant height:** Average calculated from the two tallest tree heights measured in the sample plot. Assuming 3 x 3 m planting density, the figure represents the average height of the 100 tallest trees in a hectare.

3.3. Tools

- ✚ GPS receiver
- ✚ Smartphones installed with ODK collect tool
- ✚ PVC pipe and Rope of 7.57m radius
- ✚ Metal bar

4. RESULTS

4.1. Woodlots description

- ✚ A total of 77 woodlots owned by 48 beneficiaries surveyed (Table 2).
- ✚ The village surveyed woodlots comprised a total area of 313.01 acres supported by the programme through TGIS in kind (Table 2).

Table 28: Village total number and area of woodlots

Planting year/season	Beneficiaries	Number of woodlot	Total area (acres)
2014/15	Female	5	7.34
	Male	52	154.14
	Inst. &V.group	2	14.04
2015/16	Male	17	119.52
	Inst. &V.group	1	17.96
Grand Total		77	313.01

Key: Inst. &V.group = Institutions and vulnerable groups

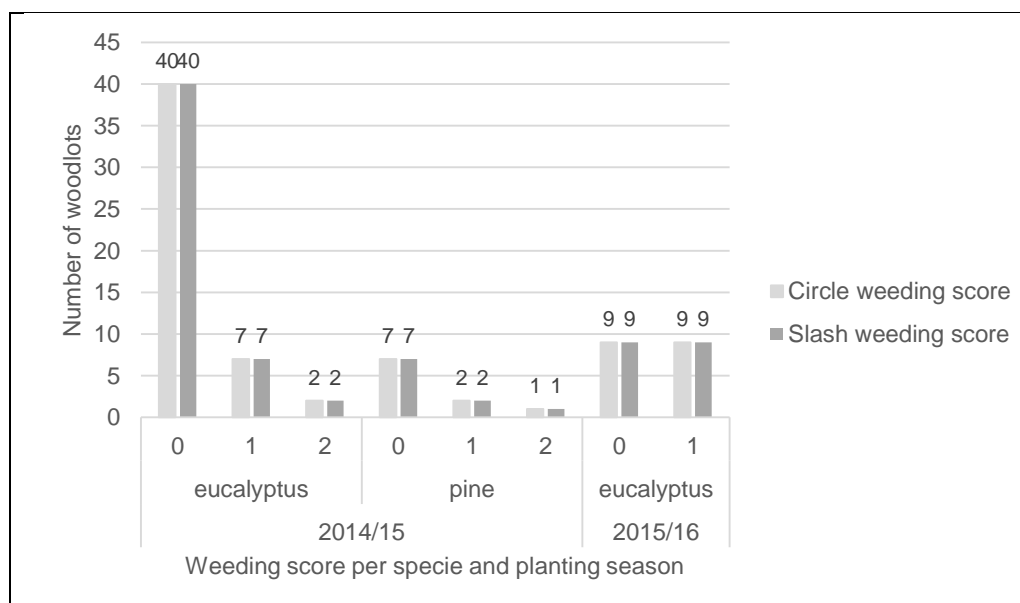
4.2. Weeding

The observed score for both, circle and slash weeding were generally low (Table 3). The frequencies for assessed weeding scores are presented in Figure. 2.

Table 29 Mean circle weeding and slash weeding scores by specie group and year of stand establishment

Beneficiary	Specie group	Circle weeding		Slash weeding	
		2014/15	2015/16	2014/15	2015/16
Female	Eucalyptus	0.60	n/a	0.60	n/a
Male	Pine	0.20	n/a	0.40	n/a
	Eucalyptus	0.17	0.53	0.19	0.53
	Eucalyptus	0.00	0.00	0.00	0.00
Grand total					

Figure 6: Mean circle weeding and slash weeding scores by woodlots



4.3. Survival and stocking

4.3.1. Fire damage

Generally, at village level fire was not a major problem affecting survival of the tree seedling. Although fire seems to be a major concern for future development of the woodlots hence mitigate measure are vital for sustainability of the woodlots.

4.3.2. Height growth

Ikang'asi village mean dominant height was good as observed in Table 4.

Table 30: Mean dominant height description

Specie group	hdom (metre)	
	2014/15	2015/16
Pines	1.18	n/a
Eucalyptus	1.62	0.57
Grand total		

Key: hdom = Dominant height

4.3.3. Survival and stocking

Table 5 below shows the general survival percentage and mean stocking for Ikang'asi village. In general, the village average survival percentage was low, as compared to other villages (Table 6).

Table 31: Mean survival percentage description

Specie group	2014/15		2015/16	
	S-%	Stock (stem/ha)	S-%	Stock (stem/ha)
Pines	87%	1011	n/a	n/a
Eucalyptus	80%	1019	79%	1179
Grand total	81%	1018	79%	1179

Key: S-% = Survival percentage

Table 32: The rank of villages by average survival percentage

Village name	Average survival percentage	Rank
Matembwe	99%	1
Usagatikwa	95%	2
Kidabaga	95%	3
Lusala	90%	4
Kiyowela	89%	5
Ukwama	84%	6
Ngalanga	83%	7
Maguguli	83%	8
Madope	83%	9
Ng'elamo	82%	10
Kifanya	82%	11
Mavanga	82%	12
Ikang'asi	81%	13
Iboya	79%	14
Itambo	77%	15
Mgala	76%	16
Utilili	72%	17
Kiwalamo	72%	18
Lugema	70%	19
Lugolofu	69%	20
Amani	68%	21
Makungu	61%	22
Ukwega	59%	23
Masimbwe	54%	24
Nhungu	48%	25

4.4. Weeding

4.4.1. Circular weeding

Table 7 below shows the general circular weeding score for Ikang'asi village. In general, the village average circular weeding score was low as compared to other villages (Table 8).

Table 33: Mean circular weeding score description

Specie group	Circle weeding score	
	2014/15	2015/16
Pines	0.20	n/a
Eucalyptus	0.20	0.50
Grand total	0.20	0.50

Table 34: The rank of villages by average circular weeding score

Villages	Average circular weeding score	Rank
Usagatikwa	1.84	1
Matembwe	1.45	2
Lugema	1.39	3
Lugolofu	1.20	4
Kiyowela	1.10	5
Maguguli	1.04	6
Kiwalamo	0.96	7
Ukwega	0.83	8
Iboya	0.83	9
Mgala	0.82	10
Nhungu	0.76	11
Mavanga	0.76	12
Ukwama	0.63	13
Lusala	0.60	14
Makungu	0.52	15
Kifanya	0.44	16
Kidabaga	0.33	17
Itambo	0.32	18
Ikang'asi	0.27	19
Ng'elamo	0.21	20
Amani	0.15	21
Utilili	0.15	22
Ngalanga	0.06	23
Madope	0.01	24
Masimbwe	0.00	25

4.4.2. Slash weeding

Table 9 below shows the general slash weeding score for Ikang'asi village. In general, the village average slash weeding score was low as compared to other villages (Table 10).

Table 35: Mean slash weeding score description

Specie group	Slash weeding score	
	2014/15	2015/16
Pines	0.40	n/a
Eucalyptus	0.22	0.50
Grand total	0.25	0.50

Table 36: The rank of villages by average slash weeding score

Villages	Average slash weeding score	Rank
Kidabaga	2.00	1
Matembwe	1.73	2
Kiyowela	1.15	3
Mavanga	1.14	4
Lugema	1.11	5
Lusala	0.93	6
Maguguli	0.88	7
Kiwalamo	0.85	8
Ukwega	0.83	9
Makungu	0.76	10
Madope	0.66	11
Mgala	0.58	12
Usagatikwa	0.47	13
Kifanya	0.35	14
Lugolofu	0.35	15
Ukwama	0.34	16
Utilili	0.33	17
Ikang'asi	0.31	18
Itambo	0.30	19
Nhungu	0.27	20
Amani	0.26	21
Iboya	0.22	22
Ngalanga	0.11	23
Masimbwe	0.03	24
Ng'elamo	0.00	25

5. CONCLUSION AND RECOMMENDATION

Generally, the villagers are encouraged to increase effort in the woodlots management activities especially weeding, in order to obtain better survival, growth and quality of trees.

Results from the survey observed a slight correlation between the weeding and survival percentage of the woodlots in Ikang'asi village. As described in Table 11, both, slash and circular weeding showed a negative and positive linear relationship to number of dead and live seedling respectively. This indicate that, woodlots with high weeding scores observed to have high number of live seedlings with less dead seedling.

Table 37: A correlation between weeding and survival score

Variable	Dead seedlings	Live seedlings
WC	-0.052	0.126
WS	-0.15	0.15

Key: WC = Circle weeding score WS = Slash weeding score

To some extent this information evaluate the need for weeding to increase survival percentage of the seedling in the woodlots. If both slash and circular weeding are done perfectly, then one could reduce the number of dead seedling and increase/maintain the number of live seedling in a particular woodlot. Scientifically weeding is proven to be vital for the survival of tree seedlings, since it reduces competition over nutrients, air and light between tree seedlings and weeds.

6. RESULTS FOR EACH INDIVIDUAL WOODLOT

Table 12 below shows the results for each individual beneficiary woodlots. It includes:

- ✚ Weeding score: both circular and slash weeding score
- ✚ Stem density (stem/ha)
- ✚ Survival percentage

Table 38: Village woodlots results

sRank	Pyear	Name	Gender	Area (acres)	Specie	WC	WS	Live	Dead	Total	Stock (stem/ha)	S-%	Hdom (metre)
1	2015/16	WILLIUM KAYANDA	male	3.11	eucalyptus	1	1	20	0	20	1111	100%	0.85
2	2014/15	MAKALYUS HNGOLI	male	3.19	eucalyptus	0	0	8	0	8	444	100%	0.55
3	2014/15	EWAD IGNAS	male	0.99	eucalyptus	0	0	19	0	19	1055	100%	1.35
4	2014/15	ZERA MWAVIKA	male	2.59	pine	0	0	17	0	17	944	100%	1.65
5	2014/15	NICKSON KITOMO	male	2.15	pine	0	0	17	0	17	944	100%	1.4
6	2014/15	RICHARD NYANGINYWA	male	4.42	eucalyptus	0	0	17	0	17	944	100%	1.35
7	2014/15	BARAKA HONGOLI	male	26.17	pine	0	2	10	0	10	555	100%	1.05
8	2014/15	WILIAM KAYANDA	male	2.99	eucalyptus	1	1	17	0	17	944	100%	3.2
9	2014/15	VITALIS KITOMO	male	1.98	eucalyptus	1	1	8	0	8	444	100%	2.65
10	2014/15	JESTEN KITOMO	male	0.00	eucalyptus	0	0	13	0	13	722	100%	2
11	2014/15	DANKAN MGUNDA	male	2.17	eucalyptus	0	0	13	0	13	722	100%	2.25
12	2014/15	BASILIO MGUNDA	male	1.80	eucalyptus	0	0	21	0	21	1166	100%	1.7
13	2014/15	ALLEN MARA	male	5.04	eucalyptus	0	0	16	0	16	889	100%	1.55
14	2014/15	ALEXANDER WAPALILE	male	1.63	eucalyptus	1	1	21	0	21	1166	100%	4.5
15	2014/15	ALEXANDER WAPALILE	male	3.04	eucalyptus	0	0	17	0	17	944	100%	1
16	2015/16	ENERIKO MGUNDA	male	2.77	eucalyptus	1	1	20	1	21	1166	95%	0.4
17	2014/15	VALELIA WAGOFYA	female	1.66	eucalyptus	1	1	20	1	21	1166	95%	2.4
18	2014/15	ATILIO MGUNDA	male	1.11	eucalyptus	0	1	20	2	22	1222	91%	1.8
19	2014/15	HERBERT NZIKU	male	2.47	eucalyptus	0	0	19	2	21	1166	90%	1.45
20	2014/15	BRUNO MGUNDA	male	2.89	eucalyptus	0	0	9	1	10	555	90%	2.3
21	2014/15	JOSEPH WAPALILA	male	2.94	eucalyptus	0	0	17	2	19	1055	89%	1.6
22	2015/16	VULNERABLE GROUP		17.96	eucalyptus	0	0	25	3	28	1555	89%	0.45
23	2014/15	VALERIA VAGOVYA	female	1.04	eucalyptus	2	2	15	2	17	944	88%	4.3
24	2015/16	MAKALIUS HONGOLI	male	7.51	eucalyptus	0	0	15	2	17	944	88%	0.35
25	2014/15	FESTO MGUNDA		2.13	eucalyptus	0	0	15	2	17	944	88%	2.2

sRank	Pyear	Name	Gender	Area (acres)	Specie	WC	WS	Live	Dead	Total	Stock (stem/ha)	S-%	Hdom (metre)
26	2014/15	NICKSON KITOMO	male	1.88	eucalyptus	0	0	20	3	23	1278	87%	1.95
27	2015/16	RICHARD NYANGINYWA	male	3.83	eucalyptus	0	0	20	3	23	1278	87%	0.55
28	2014/15	JOABU MLWALE	male	4.20	pine	0	0	18	3	21	1166	86%	1.45
29	2014/15	AMON MPANGILE	male	1.46	pine	0	0	18	3	21	1166	86%	1.5
30	2014/15	NURU KITALULA	female	1.71	eucalyptus	0	0	12	2	14	778	86%	1.55
31	2015/16	ALBERT MGUNDA	male	2.35	eucalyptus	0	0	24	4	28	1555	86%	0.75
32	2014/15	RIZIKI KABEREGE	male	2.30	eucalyptus	0	0	18	3	21	1166	86%	3.05
33	2014/15	MATRDA NYANGINYWA	female	1.53	eucalyptus	0	0	17	3	20	1111	85%	1.85
34	2014/15	JAWISA MGUNDA	male	1.41	eucalyptus	0	0	17	3	20	1111	85%	1.75
35	2014/15	KASIMU EXAUD	male	4.13	eucalyptus	0	0	11	2	13	722	85%	1.35
36	2014/15	TITO KINUNDA	female	1.41	eucalyptus	0	0	16	3	19	1055	84%	1.15
37	2014/15	ROJA KIVI	male	2.47	eucalyptus	0	0	16	3	19	1055	84%	0.9
38	2014/15	ALEX KITOMO	male	3.01	eucalyptus	0	0	15	3	18	1000	83%	1.2
39	2014/15	EDWARD IGNAS	male	0.79	pine	1	1	15	3	18	1000	83%	0.45
40	2014/15	JENRO NGACHENGA	male	1.38	eucalyptus	0	0	19	4	23	1278	83%	1.65
41	2015/16	MAKALIUS HONGOLI	male	27.75	eucalyptus	0	1	14	3	17	944	82%	0.65
42	2015/16	ATHUMAN MGUNDA	male	20.34	eucalyptus	1	1	14	3	17	944	82%	0.55
43	2014/15	FIKIRI VAHOROKA	male	1.46	pine	0	0	17	4	21	1166	81%	1.15
44	2014/15	WILIAM KAYANDA	male	3.46	pine	0	0	17	4	21	1166	81%	0.65
45	2014/15	IMELDA LISULILE	male	1.09	eucalyptus	0	0	17	4	21	1166	81%	0.75
46	2014/15	EMMANUEL MNYALAPE	male	2.99	eucalyptus	0	0	21	5	26	1444	81%	2.6
47	2015/16	ALLEN MARA	male	6.23	eucalyptus	1	0	16	4	20	1111	80%	0.65
48	2015/16	BRAYSON KABELEGE	male	4.32	eucalyptus	1	1	16	4	20	1111	80%	0.8
49	2014/15	FESTO WAPALILA	male	2.79	eucalyptus	0	0	20	5	25	1389	80%	1.85
50	2014/15	NICO MGUNDA	male	4.50	pine	0	0	16	4	20	1111	80%	1.15
51	2015/16	VITALIS KITOMO	male	5.71	eucalyptus	1	1	11	3	14	778	79%	0.35

sRank	Pyear	Name	Gender	Area (acres)	Specie	WC	WS	Live	Dead	Total	Stock (stem/ha)	S-%	Hdom (metre)
52	2014/15	RICHARD NYANGINYWA	male	1.43	eucalyptus	1	0	14	4	18	1000	78%	0.35
53	2015/16	AMON MPANGILE	male	2.77	eucalyptus	0	0	17	5	22	1222	77%	0.6
54	2014/15	GAMALYELI MGUNDA	male	2.92	eucalyptus	2	2	17	5	22	1222	77%	1.65
55	2015/16	ROJA KIVI	male	10.77	eucalyptus	0	0	22	7	29	1611	76%	0.35
56	2015/16	HERBERT NZIKU	male	6.25	eucalyptus	1	1	15	5	20	1111	75%	0.4
57	2014/15	KAIZARI KABEREGE	male	2.55	pine	1	1	12	4	16	889	75%	1.3
58	2014/15	MAKALIUS HONGOLI	male	4.77	eucalyptus	0	1	15	5	20	1111	75%	
59	2014/15	PARTSON MGUNDA	male	1.09	eucalyptus	0	0	15	5	20	1111	75%	0.65
60	2014/15	FESTO MGUNDA	male	2.79	eucalyptus	0	0	16	6	22	1222	73%	0.45
61	2014/15	JULIUS NGOLE EUC	male	4.35	eucalyptus	0	0	13	5	18	1000	72%	2.15
62	2015/16	NURU KITALULA	male	2.25	eucalyptus	0	0	18	7	25	1389	72%	0.65
63	2014/15	ENERICO MGUNDA	male	2.05	eucalyptus	0	0	16	7	23	1278	70%	1.5
64	2014/15	IKANG'ASI PRIMARY SCHOOL		11.91	eucalyptus	0	0	16	7	23	1278	70%	0.9
65	2015/16	ALEXANDER WAPALILE	male	4.25	eucalyptus	1	1	10	5	15	833	67%	0.6
66	2014/15	ATHUMAN MGUNDA	male	1.66	eucalyptus	0	0	10	5	15	833	67%	0.45
67	2014/15	ISRAEL KIVI	male	1.93	eucalyptus	0	0	12	8	20	1111	60%	0.95
68	2014/15	KASIMU KIVI	male	2.37	eucalyptus	0	0	10	7	17	944	59%	1.45
69	2014/15	NICKSON KITOMO	male	2.25	eucalyptus	1	1	10	9	19	1055	53%	0.8
70	2015/16	MAKALIUS HONGOLI	male	5.76	eucalyptus	0	0	12	11	23	1278	52%	0.25
71	2015/16	BRUNO MGUNDA	male	3.56	eucalyptus	1	1	12	11	23	1278	52%	1.05
72	2014/15	NICO MGUNDA	male	6.42	eucalyptus	0	0	10	11	21	1166	48%	0.75
73	2014/15	VITALIS KITOMO	male	4.62	eucalyptus	0	0	9	11	20	1111	45%	0.55
74	2014/15	BASIL MGUNDA	male	1.16	eucalyptus	0	0	9	12	21	1166	43%	0.55
75	2014/15	JENRO NGACHENGA	male	0.79	eucalyptus	0	0	7	13	20	1111	35%	2.6
76	2014/15	ROJA KIVI	male	1.58	eucalyptus	0	0	6	15	21	1166	29%	0.55
77	2014/15	JACKSON MGUNDA	male	2.52	eucalyptus	0	0	0	0	0	0		

Key:

sRank = Rank based on survival score
Name = Woodlot owner first and last name
Specie = tree type (name)
WS = Slash weeding
Dead = Dead seedling
Stock = Total number of seedling per hectare
Sdeath = Score for dead seedling

Pyear = Planting year
Area = Area of the woodlot in hectare
WC = Circle weeding
Live = Alive seedling
Total = Sum of seedling both dead and alive
s-% = Survival percentage
hdom = Average height of two dominant (tallest) tree

Annex 1

29. WOODLOT ASSESSMENT FIELD SURVEY FORM

Surveyors: _____ Date: _____

WOODLOT LOCATION & OWNERSHIP

30. Coordinates by GPS

31. GPS accuracy

--

32. Village: _____ District: _____

33. Woodlot owner Name, Phone number and ID number (if applicable):

34. Has the woodlot changed owner since establishment? No / Yes / Unknown

If Yes, fill in the original owner: _____

PLOT MEASUREMENTS

35. Number of trees alive in the plot

--

36. Number of trees dead in the plot

--

37. Total number of trees in the plot

--

38. Height of the plot tallest tree (in decimetres): _____ dm, Second tallest tree: _____ dm

39. In case there are dead trees, assess the likely main cause of death:

Suppression by weeds <input type="checkbox"/>	Cattle trampling: <input type="checkbox"/>
Fire damage <input type="checkbox"/>	Drought stress: <input type="checkbox"/>
Disease <input type="checkbox"/>	Other: <input type="checkbox"/>
Insect damage <input type="checkbox"/>	(specify "Other" in remarks)

GENERAL WOODLOT DATA

40. Species group: Pine / Eucalyptus / Teak *Scale: 0 – No weeding done*

41. Level of circle weeding in the woodlot: _____ *1 – Some weeding done, but not acceptably*

42. Level of slash weeding in the woodlot: _____ *2 – Weeding activities done acceptably*

3 – Weeding activities done completely

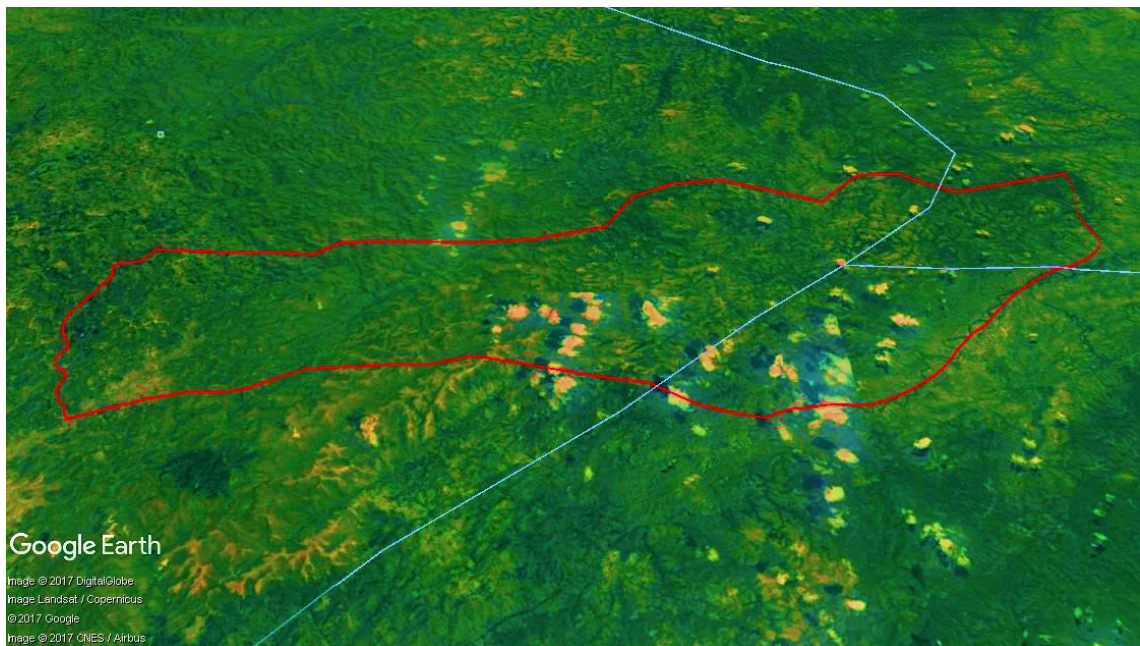
ADDITIONAL REMARKS BY SURVEYORS



End of Dry Season woodlot assessment 2016/17

End of Dry season survey feedback report for Itambo village

June 2017, Iringa, Tanzania



United Republic of Tanzania
**MINISTRY OF NATURAL RESOURCES
AND TOURISM**
Forestry and Beekeeping Division



**EMBASSY OF FINLAND
DAR ES SALAAM**

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LIST OF ANNEXES

Annex 1: Woodlot assessment field survey form

ABBREVIATIONS

GPS Global Positioning System
PFP Private Forestry Programme
TGIS Tree Growing Incentive Scheme

1. INTRODUCTION

1.1. Background

The Private Forestry Programme (PFP) is a Finnish funded development aid programme designed to run from 2014 to 2030. It increases wealth in the Southern Highlands by promoting commercial management of smallholder plantations and wood processing enterprises.

This field survey was carried out in 25 villages that have been supported in planting trees by PFP. The field work was done from December 2016 to February 2017. The purpose of the field work was to assess the performance and management of the woodlots. The results will be used by PFP to improve its support models in the future.

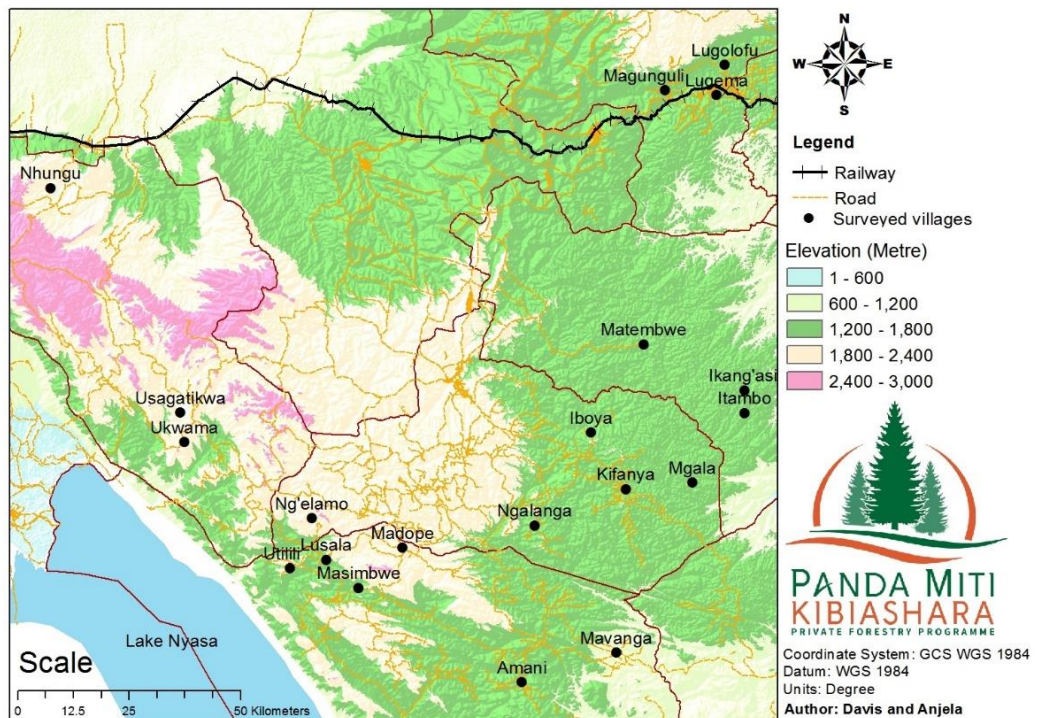
1.2. Objectives of the survey

- i. To assess the performance, survival, and level of management of the woodlots established through PFP support during the first two years of the programme.
- ii. To verify the status of the woodlots included in the PFP database.
- iii. To interview supported beneficiaries for collection of socioeconomic data.

2. LOCATION OF THE VILLAGE

Itambo village is situated between latitude 9° 23' south and longitude 35° 20' east. The village is found in the south eastern highland areas of Njombe district council in Njombe region (Figure. 1). The elevation ranges between 1200m to 1600m a.s.l.

Figure 7: A map showing the location of Itambo village with respect to other surveyed villages



3. METHODOLOGY

3.1. Field procedures

The field teams conducted the following activities while surveying the woodlots:

- ✚ Navigating to the woodlots using GPS receiver and support from local TGA personnel
- ✚ Then, a rope of radius of 7.57m was used to define the boundary of a sample plot within the woodlot
- ✚ Within the sample plots, the number of live and dead seedlings were counted (Annex 1).
- ✚ Also the level of weeding was assessed as shown in Table 1
- ✚ Metal bar was inserted for the 2015/16 established woodlots, so that they can be found later with a metal detector if needed.

Table 39 Classification for the level of weeding

Category/ Score	Title	Definition
0	No weeding done	There are practically no signs of weeding activities done during the past rainy season
1	Some weeding done, but not acceptably	There is clear evidence of weeding activities taken place during the past rainy season; however they have not been done sufficiently to ensure tree survival, good quality and good growth in the woodlot.
2	Weeding activities done acceptably	There are some shortcomings in the weeding activities, but the overall level is clearly sufficient to help ensure tree survival, good quality and good growth in the woodlot.
3	Weeding activities done completely	There are practically no signs of shortcomings, and all weeding activities appear to be conducted throughout the woodlot.

Key: The classification was reflected against the technical guidelines for circle and slash weeding as presented in the PFP TGIS guidelines. These require:

- Circle weeding: 50 cm radius to be cleared of weeds without damage to the tree in the middle.
- Slash weeding: all living weeds cut lower than 30 cm height.

It should be noted that no decisions of approval or disapproval for the level of weeding for support purposes were done in relation to this exercise.

3.2. Calculations and statistical analysis

- ✚ **Stand density (stems/ha):** the number of live trees plus number of dead trees in the sample plot, extended into a figure per hectare.
- ✚ **Survival percentage:** the share of live trees of the total number of trees in the sample plot.
- ✚ **Dominant height:** Average calculated from the two tallest tree heights measured in the sample plot. Assuming 3 x 3 m planting density, the figure represents the average height of the 100 tallest trees in a hectare.

3.3. Tools

- ✚ GPS receiver
- ✚ Smartphones installed with ODK collect tool
- ✚ PVC pipe and Rope of 7.57m radius
- ✚ Metal bar

4. RESULTS

4.1. Woodlots description

- ✚ A total of 47 woodlots owned by 33 beneficiaries surveyed (Table 2).
- ✚ The village surveyed woodlots comprised a total area of 205.67 acres supported by the programme through TGIS in kind (Table 2).

Table 40: Village total number and area of woodlots

Planting year/season	Beneficiaries	Number of woodlot	Total area (acres)
2014/15	Female	5	12.43
	Male	21	121.92
	Inst. &V.group	1	21.99
2015/16	Female	4	9.22
	Male	16	40.11
Grand Total		47	205.67

Key: Inst. &V.group = Institutions and vulnerable groups

4.2. Weeding

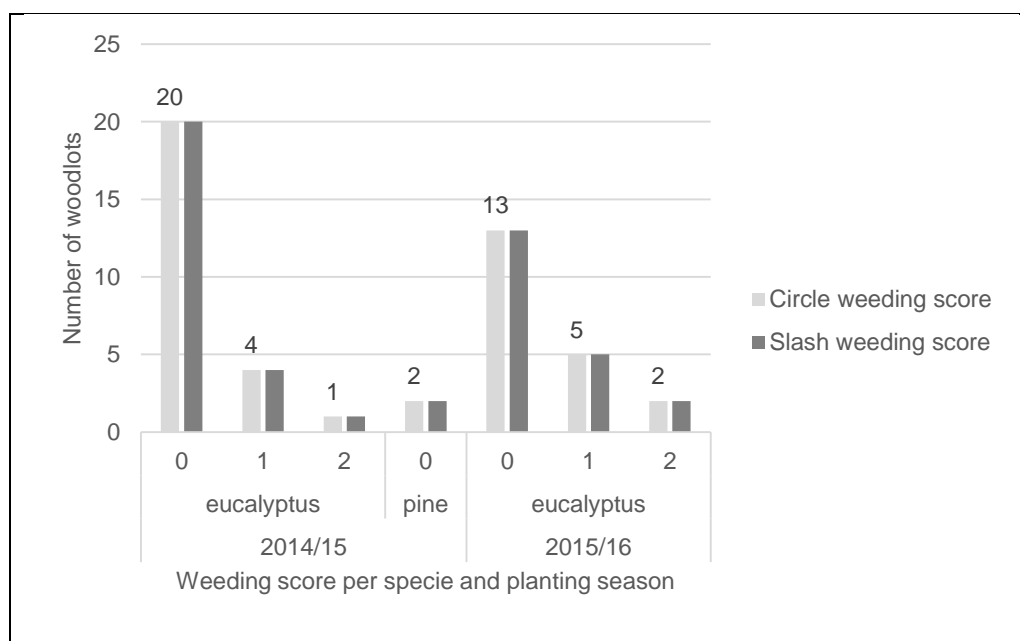
The observed score for both, circle and slash weeding were generally low (Table 3). The frequencies for assessed weeding scores are presented in Figure. 2.

Table 41 Mean circle weeding and slash weeding scores by specie group and year of stand establishment

Beneficiary	Specie group	Circle weeding		Slash weeding	
		2014/15	2015/16	2014/15	2015/16
Female	Eucalyptus	0.00	0.75	0.00	0.50
Male	Eucalyptus	0.32	0.38	0.32	0.38
	Pine	0.00	n/a	0.00	n/a
Inst. &V.group	Eucalyptus	0.00	n/a	0.00	n/a
Grand total		0.32	0.45	0.32	0.40

Key: Inst. &V.group = Institutions and vulnerable groups

Figure 8: Mean circle weeding and slash weeding scores by woodlots



4.3. Survival and stocking

4.3.1. Fire damage

Generally, fire was a major problem affecting survival of the tree seedling at Itambo village. A total of 15 woodlots equivalent to 56.32 acres were affected by fire (Table 4), hence mitigate measure are vital for sustainability of the woodlots.

Table 42: Description of the woodlot damaged by fire

S/N	Remarks	Number
1	Number of woodlots	15
2	Area (acres)	56.32

4.3.2. Height growth

Itambo village mean dominant height was good as observed in Table 5.

Table 43: Mean dominant height description

Specie group	hdom (metre)	
	2014/15	2015/16
Pines	1.525	n/a
Eucalyptus	1.181	0.469
Grand total	1.208	0.469

Key: hdom = Dominant height

4.3.3. Survival and stocking

Table 6 below shows the general survival percentage and mean stocking for Itambo village. In general, the village average survival percentage was low, as compared to other villages (Table 7).

Table 44: Mean survival percentage description

Specie group	2014/15		2015/16	
	S-%	Stock (stem/ha)	S-%	Stock (stem/ha)
Pines	92	933	n/a	n/a
Eucalyptus	86	1111	64	1036
Grand total	87	946	64	1036

Key: S-% = Survival percentage

Table 45: The rank of villages by average survival percentage

Village name	Average survival percentage	Rank
Matembwe	99%	1
Usagatikwa	95%	2
Kidabaga	95%	3
Lusala	90%	4
Kiyowela	89%	5
Ukwama	84%	6
Ngalanga	83%	7
Maguguli	83%	8
Madope	83%	9
Ng'elamo	82%	10
Kifanya	82%	11
Mavanga	82%	12
Ikang'asi	81%	13
Iboya	79%	14
Itambo	77%	15
Mgala	76%	16
Utilili	72%	17
Kiwalamo	72%	18
Lugema	70%	19
Lugolofu	69%	20
Amani	68%	21
Makungu	61%	22
Ukwega	59%	23
Masimbwe	54%	24
Nhungu	48%	25

4.4. Weeding

4.4.1. Circular weeding

Table 8 below shows the general circular weeding score for Itambo village. In general, the village average circular weeding score was low as compared to other villages (Table 9).

Table 46: Mean circular weeding score description

Specie group	Circle weeding score	
	2014/15	2015/16
Pines	0.00	n/a
Eucalyptus	0.24	0.45
Grand total	0.24	0.45

Table 47: The rank of villages by average circular weeding score

Villages	Average circular weeding score	Rank
Usagatikwa	1.84	1
Matembwe	1.45	2
Lugema	1.39	3
Lugolofu	1.20	4
Kiyowela	1.10	5
Maguguli	1.04	6
Kiwalamo	0.96	7
Ukwega	0.83	8
Iboya	0.83	9
Mgala	0.82	10
Nhungu	0.76	11
Mavanga	0.76	12
Ukwama	0.63	13
Lusala	0.60	14
Makungu	0.52	15
Kifanya	0.44	16
Kidabaga	0.33	17
Itambo	0.32	18
Ikang'asi	0.27	19
Ng'elamo	0.21	20
Amani	0.15	21
Utilili	0.15	22
Ngalanga	0.06	23
Madope	0.01	24
Masimbwe	0.00	25

4.4.2. Slash weeding

Table 10 below shows the general slash weeding score for Itambo village. In general, the village average slash weeding score was low as compared to other villages (Table 11).

Table 48: Mean slash weeding score description

Specie group	Slash weeding score	
	2014/15	2015/16
Pines	0.00	n/a
Eucalyptus	0.24	0.40
Grand total	0.24	0.40

Table 49: The rank of villages by average slash weeding score

Villages	Average slash weeding score	Rank
Kidabaga	2.00	1
Matembwe	1.73	2
Kiyowela	1.15	3
Mavanga	1.14	4
Lugema	1.11	5
Lusala	0.93	6
Maguguli	0.88	7
Kiwalamo	0.85	8
Ukwega	0.83	9
Makungu	0.76	10
Madope	0.66	11
Mgala	0.58	12
Usagatikwa	0.47	13
Kifanya	0.35	14
Lugolofu	0.35	15
Ukwama	0.34	16
Utilili	0.33	17
Ikang'asi	0.31	18
Itambo	0.30	19
Nhungu	0.27	20
Amani	0.26	21
Iboya	0.22	22
Ngalanga	0.11	23
Masimbwe	0.03	24
Ng'elamo	0.00	25

5. CONCLUSION AND RECOMMENDATION

Generally, the villagers are encouraged to increase effort in the woodlots management activities especially weeding, in order to obtain better survival, growth and quality of trees.

Results from the survey observed a slight correlation between the weeding and survival percentage of the woodlots in Itambo village. As described in Table 12, both, slash and circular weeding showed a negative and positive linear relationship to number of dead and live seedling respectively. This indicate that, woodlots with high weeding scores observed to have high number of live seedlings with less dead seedling.

Table 50: A correlation between weeding and survival score

Variable	Dead seedlings	Live seedlings
WC	-0.22	0.26
WS	-0.085	0.14

Key: WC = Circle weeding score WS = Slash weeding score

To some extent this information evaluate the need for weeding to increase survival percentage of the seedling in the woodlots. If both slash and circular weeding are done perfectly, then one could reduce the number of dead seedling and increase/maintain the number of live seedling in a particular woodlot. Scientifically weeding is proven to be vital for the survival of tree seedlings, since it reduces competition over nutrients, air and light between tree seedlings and weeds.

6. RESULTS FOR EACH INDIVIDUAL WOODLOT

Table 13 below shows the results for each individual beneficiary woodlots. It includes:

- ✚ Weeding score: both circular and slash weeding score
- ✚ Stem density (stem/ha)
- ✚ Survival percentage

Table 51: Village woodlots results

sRank	Pyear	Name	Gender	Area (acres)	Specie	WC	WS	Live	Dead	Total	Stock (stem/ha)	S-%	Hdom (metre)
	2015/16	RUKIA MALILE	Male	1.90	eucalyptus	0	0	0	22	22	1222	0%	
	2014/15	SUBIRI MABENA	Male	1.75	pine	0	0	21	1	22	1222	95%	1.5
	2014/15	GAUDENCE MPETTE	Male	1.71	eucalyptus	0	0	16	0	16	889	100%	0.4
	2015/16	GAUDENNCE MPETE	Female	3.88	eucalyptus	1	2	19	0	19	1055	100%	0.55
	2015/16	GAUDENCE MPETE	Female	1.58	eucalyptus	2	0	17	1	18	1000	94%	0.5
	2015/16	SIMON MABENA	Male	2.10	eucalyptus	0	0	12	6	18	1000	67%	0.45
	2014/15	EMANUELMABENA	Male	1.73	eucalyptus	0	0	21	0	21	1166	100%	2.6
	2014/15	SALOME LUGALA	Female	2.30	eucalyptus	0	0	11	2	13	722	85%	0.55
	2014/15	MARIA UHAHULA	Female	1.78	eucalyptus	0	0	10	0	10	555	100%	0.35
	2014/15	RICHARD NGUHULA(1ha)	Male	2.27	eucalyptus	0	0	21	1	22	1222	95%	1.6
	2015/16	RICHARD NGUHULA	Male	1.88	eucalyptus	1	0	14	5	19	1055	74%	0.4
	2014/15	PHILIPO MABENA	Male	2.55	eucalyptus	0	0	22	2	24	1333	92%	2
	2015/16	PHILIPO MABENA	Male	2.47	eucalyptus	0	0	15	6	21	1166	71%	0.5
	2014/15	SAMSON MABENA	Male	1.88	eucalyptus	0	0	15	0	15	833	100%	2.55
	2014/15	STEPHANO MABENA	Male	2.27	eucalyptus	0	0	16	0	16	889	100%	2
	2015/16	STEPHANO MABENA	Male	2.45	eucalyptus	0	1	15	6	21	1166	71%	0.7
	2014/15	BENEDICTO KAPAGALA	Male	3.51	eucalyptus	0	0	23	0	23	1278	100%	1.95
	2015/16	BENEDICTO KAPANGALA	Male	7.93	eucalyptus	2	1	20	0	20	1111	100%	1.05
	2014/15	SADICK MABENA	Male	2.27	eucalyptus	0	0	13	0	13	722	100%	0.3
	2014/15	ROBERT MALILE	Male	2.82	eucalyptus	1	1	20	0	20	1111	100%	1.55
	2015/16	ROBERT MALILE	Male	2.94	eucalyptus	1	1	17	0	17	944	100%	0.85
	2014/15	YONA MALILE	Male	2.45	eucalyptus	0	0	14	0	14	778	100%	2.3
	2014/15	LUKIA MALILE	Female	3.95	eucalyptus	0	0	13	3	16	889	81%	3.5
	2015/16	EDA NJEGESI	Female	1.68	eucalyptus	0	0	14	4	18	1000	78%	0.75
	2015/16	LEMIJA HONGOLI	Male	1.43	eucalyptus	1	1	9	13	22	1222	41%	0.15

sRank	Pyear	Name	Gender	Area (acres)	Specie	WC	WS	Live	Dead	Total	Stock (stem/ha)	S-%	Hdom (metre)
	2014/15	LEMIJA HONGOLI	Male	1.83	pine	0	0	16	2	18	1000	89%	1.55
	2014/15	ALLYMABENA	Male	2.25	eucalyptus	0	0	14	0	14	778	100%	0.6
	2014/15	DAUD MABENA	Male	3.11	eucalyptus	1	1	20	0	20	1111	100%	1.55
	2015/16	DAUDI MABENA	Male	2.47	eucalyptus	0	1	0	21	21	1166	0%	
	2014/15	NEHEMIA MAKWETA	Male	4.15	eucalyptus	1	1	12	3	15	833	80%	0.3
	2014/15	LAZARO MABENA	Male	3.04	eucalyptus	0	0	6	0	6	333	100%	0.3
	2014/15	ADELA MWAISANGO	Female	1.88	eucalyptus	0	0	19	0	19	1055	100%	0.65
	2015/16	ADELA MWAISANGO	Female	2.08	eucalyptus	0	0	5	17	22	1222	23%	0.25
	2015/16	WILFRED CHEMBELA	Male	1.78	eucalyptus	0	0	10	0	10	555	100%	0.25
	2014/15	WILFRED CHEMBELA	Male	1.88	eucalyptus	0	0	13	0	13	722	100%	1.15
	2015/16	WILFRED CHEMBELA	Male	1.58	eucalyptus	0	0	10	7	17	944	59%	0.4
	2015/16	IBRAHIMU HONGOLI	Male	1.88	eucalyptus	0	0	7	12	19	1055	37%	0.3
	2014/15	AMALIA CHOVANI	Male	1.71	eucalyptus	0	0	0	22	22	1222	0%	
	2014/15	GODFREY MSEMWA	Male	25.58	eucalyptus	0	0	3	17	20	1111	15%	0.2
	2014/15	MARKO KABELEGE	Male	52.11	eucalyptus	2	2	13	0	13	722	100%	0.7
	2014/15	REHEMA KABELEGE	Female	2.52	eucalyptus	0	0	12	10	22	1222	55%	0.3
	2015/16	YUSUF MABENA	Male	2.08	eucalyptus	0	0	15	7	22	1222	68%	0.25
	2015/16	SHADRACK MALILE	Male	1.53	eucalyptus	0	0	9	5	14	778	64%	0.15
	2014/15	ALEXANDER KIPALILE	Male	1.06	eucalyptus	1	1	15	3	18	1000	83%	0.55
	2015/16	JOSFAT MABENA	Male	3.16	eucalyptus	1	1	13	4	17	944	76%	0.45
	2015/16	ENES MALILE	Male	2.52	eucalyptus	0	0	10	6	16	889	63%	0.5
	2014/15	VULNERABLE GROUP		21.99	eucalyptus	0	0	10	5	15	833	67%	0.4

Key:

sRank = Rank based on survival score
Name = Woodlot owner first and last name
Specie = tree type (name)
WS = Slash weeding
Dead = Dead seedling
Stock = Total number of seedling per hectare
Sdeath = Score for dead seedling

Pyear = Planting year
Area = Area of the woodlot in hectare
WC = Circle weeding
Live = Alive seedling
Total = Sum of seedling both dead and alive
s-% = Survival percentage
hdom = Average height of two dominant (tallest) tree

Form Number:

Annex 1

1. WOODLOT ASSESSMENT FIELD SURVEY FORM

Surveyors: _____ Date: _____

WOODLOT LOCATION & OWNERSHIP

2. Coordinates by GPS

3. GPS accuracy

4. Village: _____ District: _____

5. Woodlot owner Name, Phone number and ID number (if applicable):

6. Has the woodlot changed owner since establishment? No / Yes / Unknown

If Yes, fill in the original owner: _____

PLOT MEASUREMENTS

7. Number of trees alive in the plot

8. Number of trees dead in the plot

9. Total number of trees in the plot

10. Height of the plot tallest tree (in decimetres): _____ dm, Second tallest tree: _____ dm

11. In case there are dead trees, assess the likely main cause of death:

Suppression by weeds

Cattle trampling:

Fire damage

Drought stress:

Disease

Other:

Insect damage

(specify "Other" in remarks)

GENERAL WOODLOT DATA

12. Species group: Pine / Eucalyptus / Teak

Scale: 0 – No weeding done
1 – Some weeding done, but not acceptably

13. Level of circle weeding in the woodlot: _____

14. Level of slash weeding in the woodlot: _____

2 – Weeding activities done acceptably
3 – Weeding activities done completely

ADDITIONAL REMARKS BY SURVEYORS



End of Dry Season woodlot assessment 2016/17

End of Dry season survey feedback report for Kifanya village

June 2017, Iringa, Tanzania



United Republic of Tanzania
**MINISTRY OF NATURAL RESOURCES
AND TOURISM**
Forestry and Beekeeping Division



**EMBASSY OF FINLAND
DAR ES SALAAM**

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LIST OF ANNEXES

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1.1. Background

The Private Forestry Programme (PFP) is a Finnish funded development aid programme designed to run from 2014 to 2030. It increases wealth in the Southern Highlands by promoting commercial management of smallholder plantations and wood processing enterprises.

This field survey was carried out in 25 villages that have been supported in planting trees by PFP. The field work was done from December 2016 to February 2017. The purpose of the field work was to assess the performance and management of the woodlots. The results will be used by PFP to improve its support models in the future.

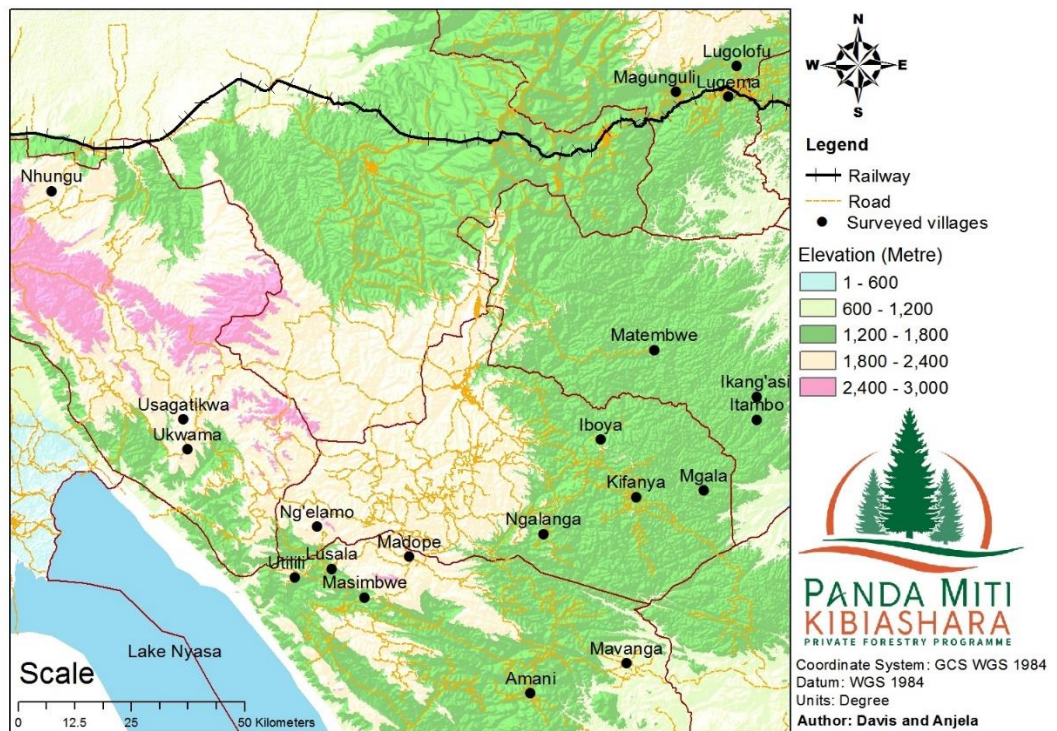
1.2. Objectives of the survey

- i. To assess the performance, survival, and level of management of the woodlots established through PFP support during the first two years of the programme.
- ii. To verify the status of the woodlots included in the PFP database.
- iii. To interview supported beneficiaries for collection of socioeconomic data.

2. LOCATION OF THE VILLAGE

Kifanya village is situated between latitude 9° 32' south and longitude 35° 06' east. The village is found in the southern highland areas of Njombe town council in Njombe region (Figure. 1). The elevation ranges between 1500m to 1800m a.s.l.

Figure 9: A map showing the location of Kifanya village with respect to other surveyed villages



3. METHODOLOGY

3.1. Field procedures

The field teams conducted the following activities while surveying the woodlots:

- ✚ Navigating to the woodlots using GPS receiver and support from local TGA personnel
- ✚ Then, a rope of radius of 7.57m was used to define the boundary of a sample plot within the woodlot
- ✚ Within the sample plots, the number of live and dead seedlings were counted (Annex 1).
- ✚ Also the level of weeding was assessed as shown in Table 1
- ✚ Metal bar was inserted for the 2015/16 established woodlots, so that they can be found later with a metal detector if needed.

Table 52 Classification for the level of weeding

Category/ Score	Title	Definition
0	No weeding done	There are practically no signs of weeding activities done during the past rainy season
1	Some weeding done, but not acceptably	There is clear evidence of weeding activities taken place during the past rainy season; however they have not been done sufficiently to ensure tree survival, good quality and good growth in the woodlot.
2	Weeding activities done acceptably	There are some shortcomings in the weeding activities, but the overall level is clearly sufficient to help ensure tree survival, good quality and good growth in the woodlot.
3	Weeding activities done completely	There are practically no signs of shortcomings, and all weeding activities appear to be conducted throughout the woodlot.

Key: The classification was reflected against the technical guidelines for circle and slash weeding as presented in the PFP TGIS guidelines. These require:

- Circle weeding: 50 cm radius to be cleared of weeds without damage to the tree in the middle.
- Slash weeding: all living weeds cut lower than 30 cm height.

It should be noted that no decisions of approval or disapproval for the level of weeding for support purposes were done in relation to this exercise.

3.2. Calculations and statistical analysis

- ✚ **Stand density (stems/ha):** the number of live trees plus number of dead trees in the sample plot, extended into a figure per hectare.
- ✚ **Survival percentage:** the share of live trees of the total number of trees in the sample plot.
- ✚ **Dominant height:** Average calculated from the two tallest tree heights measured in the sample plot. Assuming 3 x 3 m planting density, the figure represents the average height of the 100 tallest trees in a hectare.

3.3. Tools

- ✚ GPS receiver
- ✚ Smartphones installed with ODK collect tool
- ✚ PVC pipe and Rope of 7.57m radius
- ✚ Metal bar

4. RESULTS

4.1. Woodlots description

- A total of 126 woodlots owned by 68 beneficiaries surveyed (Table 2).
- The village surveyed woodlots comprised a total area of 510.52 acres supported by the programme through TGIS in kind (Table 2).

Table 53: Village total number and area of woodlots

Planting year/season	Beneficiaries	Number of woodlot	Total area (acres)
2014/15	Female	24	54.63
	Male	60	263.49
	Inst. &V.group	9	34.20
2015/16	Female	8	17.79
	Male	23	133.21
	Inst. &V.group	2	7.19
Grand Total		126	510.52

Key: Inst. &V.group = Institutions and vulnerable groups

4.2. Weeding

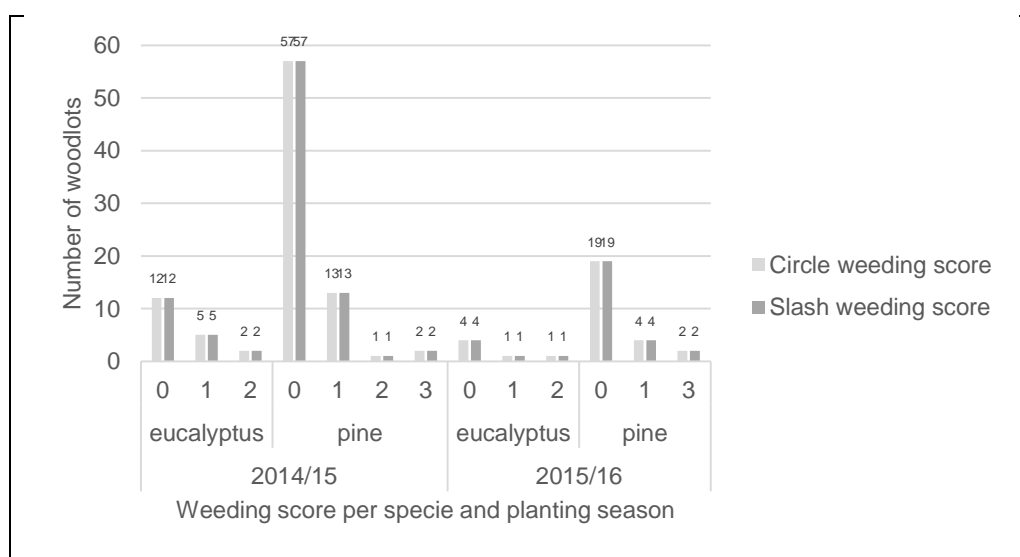
The observed score for both, circle and slash weeding were generally low (Table 3). The frequencies for assessed weeding scores are presented in Figure. 2.

Table 54 Mean circle weeding and slash weeding scores by specie group and year of stand establishment

Beneficiary	Specie group	Circle weeding		Slash weeding	
		2014/15	2015/16	2014/15	2015/16
Female	Pine	0.32	0.83	0.26	0.67
	Eucalyptus	0.50	1.00	0.50	1.00
Male	Pine	0.40	0.24	0.32	0.18
	Eucalyptus	0.33	0.80	0.17	0.40
Inst. &V.group	Pine	0.25	1.50	0.50	1.50
	Eucalyptus	1.00	n/a	1.20	n/a
Grand total		0.40	0.55	0.33	0.42

Key: Inst. &V.group = Institutions and vulnerable groups

Figure 10: Mean circle weeding and slash weeding scores by woodlots



4.3. Survival and stocking

4.3.1. Fire damage

Generally, at village level fire was not a major problem affecting survival of the tree seedling. Although, fire seems to be a major concern for the future development of the woodlots, hence mitigate measure are vital for sustainability of the woodlots.

4.3.2. Height growth

Kifanya village mean dominant height was good as observed in Table 5.

Table 55: Mean dominant height description

Specie group	hdom (metre)	
	2014/15	2015/16
Pines	1.39	0.62
Eucalyptus	1.33	0.48
Grand total	1.37	0.59

Key: hdom = Dominant height

4.3.3. Survival and stocking

Table 6 below shows the general survival percentage and mean stocking for Kifanya village. In general, the village average survival percentage was low, as compared to other villages (Table 7).

Table 56: Mean survival percentage description

Specie group	2014/15		2015/16	
	S-%	Stock (stem/ha)	S-%	Stock (stem/ha)
Pines	86%	1074	84%	984
Eucalyptus	68%	979	76%	1028
Grand total	82%	1054	82%	964

Key: S-% = Survival percentage

Table 57: The rank of villages by average survival percentage

Village name	Average survival percentage	Rank
Matembwe	99%	1
Usagatikwa	95%	2
Kidabaga	95%	3
Lusala	90%	4
Kiyowela	89%	5
Ukwama	84%	6
Ngalanga	83%	7
Maguguli	83%	8
Madope	83%	9
Ng'elamo	82%	10
Kifanya	82%	11
Mavanga	82%	12
Ikang'asi	81%	13
Iboya	79%	14
Itambo	77%	15
Mgala	76%	16
Utilili	72%	17
Kiwalamo	72%	18
Lugema	70%	19
Lugolofu	69%	20
Amani	68%	21
Makungu	61%	22
Ukwega	59%	23
Masimbwe	54%	24
Nhungu	48%	25

4.4. Weeding

4.4.1. Circular weeding

Table 8 below shows the general circular weeding score for Kifanya village. In general, the village average circular weeding score was low as compared to other villages (Table 9).

Table 58: Mean circular weeding score description

Specie group	Circle weeding score	
	2014/15	2015/16
Pines	0.37	0.48
Eucalyptus	0.53	0.83
Grand total	0.40	0.55

Table 59: The rank of villages by average circular weeding score

Villages	Average circular weeding score	Rank
Usagatikwa	1.84	1
Matembwe	1.45	2
Lugema	1.39	3
Lugolofu	1.20	4
Kiyowela	1.10	5
Maguguli	1.04	6
Kiwalamo	0.96	7
Ukwega	0.83	8
Iboya	0.83	9
Mgala	0.82	10
Nhungu	0.76	11
Mavanga	0.76	12
Ukwama	0.63	13
Lusala	0.60	14
Makungu	0.52	15
Kifanya	0.44	16
Kidabaga	0.33	17
Itambo	0.32	18
Ikang'asi	0.27	19
Ng'elamo	0.21	20
Amani	0.15	21
Utilili	0.15	22
Ngalanga	0.06	23
Madope	0.01	24
Masimbwe	0.00	25

4.4.2. Slash weeding

Table 10 below shows the general slash weeding score for Kifanya village. In general, the village average slash weeding score was low as compared to other villages (Table 11).

Table 60: Mean slash weeding score description

Specie group	Slash weeding score	
	2014/15	2015/16
Pines	0.29	0.40
Eucalyptus	0.47	0.50
Grand total	0.33	0.42

Table 61: The rank of villages by average slash weeding score

Villages	Average slash weeding score	Rank
Kidabaga	2.00	1
Matembwe	1.73	2
Kiyowela	1.15	3
Mavanga	1.14	4
Lugema	1.11	5
Lusala	0.93	6
Maguguli	0.88	7
Kiwalamo	0.85	8
Ukwega	0.83	9
Makungu	0.76	10
Madope	0.66	11
Mgala	0.58	12
Usagatikwa	0.47	13
Kifanya	0.35	14
Lugolofu	0.35	15
Ukwama	0.34	16
Utilili	0.33	17
Ikang'asi	0.31	18
Itambo	0.30	19
Nhungu	0.27	20
Amani	0.26	21
Iboya	0.22	22
Ngalanga	0.11	23
Masimbwe	0.03	24
Ng'elamo	0.00	25

5. CONCLUSION AND RECOMMENDATION

Generally, the villagers are encouraged to increase effort in the woodlots management activities especially weeding, in order to obtain better survival, growth and quality of trees.

Results from the survey observed a slight correlation between the weeding and survival percentage of the woodlots in Kifanya village. As described in Table 12, both, slash and circular weeding showed a negative and positive linear relationship to number of dead and live seedling respectively. This indicate that, woodlots with high weeding scores observed to have high number of live seedlings with less dead seedling.

Table 62: A correlation between weeding and survival score

Variable	Dead seedlings	Live seedlings
WC	-0.11	0.04
WS	-0.18	0.105

Key: WC = Circle weeding score WS = Slash weeding score

To some extent this information evaluate the need for weeding to increase survival percentage of the seedling in the woodlots. If both slash and circular weeding are done perfectly, then one could reduce the number of dead seedling and increase/maintain the number of live seedling in a particular woodlot. Scientifically weeding is proven to be vital for the survival of tree seedlings, since it reduces competition over nutrients, air and light between tree seedlings and weeds.

6. RESULTS FOR EACH INDIVIDUAL WOODLOT

Table 13 below shows the results for each individual beneficiary woodlots. It includes:

- ✚ Weeding score: both circular and slash weeding score
- ✚ Stem density (stem/ha)
- ✚ Survival percentage

Table 63: Village woodlots results

sRank	Pyear	Name	Gender	Area (acres)	Specie	WC	WS	Live	Dead	Total	Stock (stem/ha)	S-%	Hdom (metre)
1	2014/15	YESSE MTEWELE	Male	33.68	eucalyptus	0	0	11	0	11	611	100%	1.35
2	2014/15	BLASIUS MKALAWA	Male	0.96	pine	0	0	20	0	20	1111	100%	1.6
3	2014/15	MARGRETH NYADZI	Female	3.51	pine	0	0	21	0	21	1166	100%	1.3
4	2015/16	MAGRETHI	Female	0.77	pine	0	0	16	0	16	889	100%	0.7
5	2014/15	ONIDA MKUNGWA	Male	2.22	pine	0	0	22	0	22	1222	100%	1.6
6	2014/15	ERICK NGOLE	Male	4.25	pine	1	1	20	0	20	1111	100%	1.55
7	2014/15	JONAS MTEWELE	Male	2.97	pine	0	0	23	0	23	1278	100%	2.25
8	2015/16	ELMA MPOGOLE	Female	1.53	pine	3	3	14	0	14	778	100%	0.45
9	2014/15	MARTIN MWIGUNE	Male		eucalyptus	0	0	13	0	13	722	100%	2.05
10	2014/15	DIONIS LUKINJA	Male	1.71	pine	1	1	19	0	19	1055	100%	1.75
11	2015/16	JORDAN MCHAMI	Male	0.91	pine	1	0	16	0	16	889	100%	0.85
12	2014/15	JORDAN MCHAMI	Male	0.91	pine	0	1	14	0	14	778	100%	0.7
13	2014/15	FELISTA MTEWELE	Female	2.00	pine	0	0	20	0	20	1111	100%	1.1
14	2014/15	GEORGE KAHWILI	Male	1.85	pine	0	0	21	0	21	1166	100%	1
15	2014/15	SELINA MVANDA	Female	1.41	pine	0	0	20	0	20	1111	100%	2.25
16	2014/15	ONESMO CHENGULA	Male	3.16	pine	0	0	15	0	15	833	100%	0.65
17	2014/15	OCTAVIAN MAYEMBA	Male	2.84	pine	1	1	19	0	19	1055	100%	1.65
18	2015/16	PIUS LYAGULA	Male	0.96	pine	0	0	19	0	19	1055	100%	0.75
19	2014/15	PIUS LYAGULA	Male	0.94	pine	0	0	14	0	14	778	100%	1.05
20	2014/15	GASPAR LUNYUNGU	Male	1.31	pine	1	0	19	0	19	1055	100%	1.1
21	2014/15	GASPAR LUNYUNGU	Male	1.53	pine	0	0	19	0	19	1055	100%	2.2
22	2014/15	OVIN MG'ONG'O	Male	0.77	pine	0	0	16	0	16	889	100%	2.85
23	2015/16	EBEHATI MKALAWA	Male	1.43	pine	0	0	17	0	17	944	100%	0.45
24	2014/15	FREDRICK MGAYA	Male	1.04	pine	3	3	14	0	14	778	100%	1.85
25	2014/15	CATHOLIC CHURCH		0.79	pine	0	1	14	0	14	778	100%	1.2

sRank	Pyear	Name	Gender	Area (acres)	Specie	WC	WS	Live	Dead	Total	Stock (stem/ha)	S-%	Hdom (metre)
26	2014/15	STELLA LICKY	Female	5.96	eucalyptus	1	1	16	0	16	889	100%	1.35
27	2015/16	PAULO MAHALI	Male	4.92	pine	0	0	22	0	22	1222	100%	0.7
28	2015/16	BETRANDE MGAYA	Male	1.38	pine	0	0	29	0	29	1611	100%	0.45
29	2015/16	RUDGER MGENI	Male	5.76	pine	0	0	21	0	21	1166	100%	0.6
30	2015/16	KIF CATHOLIC SISTERS		0.79	pine	0	0	13	0	13	722	100%	0.55
31	2014/15	VULNERBLE GROUP		4.52	pine	1	1	18	0	18	1000	100%	1.15
32	2015/16	KIFANYA PRIMARY SCHOOL		6.40	pine	3	3	21	0	21	1166	100%	1.05
33	2014/15	EBEHART MKALAWA	Male	2.57	pine	0	0	21	0	21	1166	100%	1.7
34	2014/15	CRISPIN MPONDA	Male	3.71	pine	0	0	27	1	28	1555	96%	1.6
35	2014/15	FELISTA MTEWELE	Female	1.48	pine	0	0	25	1	26	1444	96%	1.7
36	2015/16	BEATRICE MKONGWA	Female	2.47	eucalyptus	1	1	25	1	26	1444	96%	0.4
37	2014/15	BLASIUS MKALAWA	Male	1.58	pine	0	0	20	1	21	1166	95%	1.8
38	2014/15	BEATRICE MKONGWA	Female	2.08	pine	1	1	20	1	21	1166	95%	1.8
39	2014/15	SELINA MVANDA	Female	1.56	pine	0	0	20	1	21	1166	95%	2.15
40	2014/15	FILOTEUS LWEKELA	Male	3.61				18	1	19	1055	95%	1.25
41	2015/16	THEA LUKINJA	Female	0.99	pine	1	1	16	1	17	944	94%	0.6
42	2014/15	VULNERBLE GROUP		1.56	pine	0	0	15	1	16	889	94%	1.25
43	2015/16	GEORGE KAHWILI	Male	24.98	pine	0	0	14	1	15	833	93%	0.85
44	2015/16	TRIPHONIA LUKINJA	Female	3.73	pine	0	0	12	1	13	722	92%	1.45
45	2014/15	RUKIA DANDA	Female	0.91	pine	0	0	11	1	12	667	92%	1.4
46	2015/16	OVIN MNGONG	Male	1.66	eucalyptus	2	2	11	1	12	667	92%	1.05
47	2014/15	KLAVERY CHENGULA	Male	2.97	pine	0	0	22	2	24	1333	92%	1.4
48	2014/15	MTONYA MLELWA	Male		pine	0	0	21	2	23	1278	91%	1.15
49	2015/16	FELIX LYAGULA	Male	2.92	pine	0	0	21	2	23	1278	91%	0.35
50	2014/15	ALBERTINA MUHENGA	Female	2.52	pine	1	1	20	2	22	1222	91%	1.75

sRank	Pyear	Name	Gender	Area (acres)	Specie	WC	WS	Live	Dead	Total	Stock (stem/ha)	S-%	Hdom (metre)
51	2014/15	ALBERTO P MKALAWA	Male	4.03	pine	0	0	10	1	11	611	91%	0.8
52	2014/15	BENWARD CHATANDA	Male	3.19	pine	0	0	20	2	22	1222	91%	2.25
53	2014/15	MARIA MKALAWA	Female	2.77	pine	1	0	19	2	21	1166	90%	1.95
54	2014/15	BEATRICE MKONGWA	Female	1.78	pine	0	0	19	2	21	1166	90%	1.85
55	2014/15	ALBERTINA MUHENGA	Female	2.05	pine	1	0	18	2	20	1111	90%	1.45
56	2014/15	GEORGE KAHWILI	Male	14.23	pine	1	1	18	2	20	1111	90%	0.55
57	2014/15	CLAVERY CHENGULA	Male	7.71	pine	1	1	17	2	19	1055	89%	2.05
58	2014/15	YESSE MTEWELE	Male		pine	0	0	25	3	28	1555	89%	1.35
59	2014/15	PIUS LYAGULA	Male	2.45	pine	1	1	16	2	18	1000	89%	1.65
60	2014/15	KAMILUS NZENGE	Male	2.57	pine	3	3	15	2	17	944	88%	0.85
61	2015/16	SELINA MVANDA	Female	4.57	pine	1	0	14	2	16	889	88%	0.15
62	2015/16	BENWARD CHATANDA	Male	8.85	pine	0	0	14	2	16	889	88%	0.55
63	2015/16	JOHN MABOZI	Male	5.98	pine	1	1	14	2	16	889	88%	0.55
64	2014/15	RENALD CHENGULA	Male	1.28	pine	0	0	20	3	23	1278	87%	1.5
65	2014/15	JOYCE MPOGOLE	Female	2.32	pine	0	0	20	3	23	1278	87%	2.05
66	2014/15	FILOTEUS LWEKELA	Male	1.43	pine	1	0	19	3	22	1222	86%	1.35
67	2014/15	GEORGE KAHWILI	Male	1.56	eucalyptus	1	0	18	3	21	1166	86%	0.35
68	2014/15	GASPAR LUNYUNGU	Male	2.42	pine	1	2	18	3	21	1166	86%	1.15
69	2014/15	MONICA MFIKWA	Female	6.08	pine	0	0	18	3	21	1166	86%	0.75
70	2014/15	ONESMO MFIKWA	Male	5.12	pine	0	0	12	2	14	778	86%	1.1
71	2014/15	VULNERBLE GROUP		6.82	eucalyptus	1	1	18	3	21	1166	86%	2.7
72	2014/15	GEORGE KAHWILI	Male	1.58	pine	0	0	17	3	20	1111	85%	0.95
73	2014/15	VULNERBLE GROUP		4.52	eucalyptus	2	2	17	3	20	1111	85%	1.75
74	2015/16	BERTINA MWENDA	Female	2.10				16	3	19	1055	84%	0.4
75	2014/15	JOHN MCHAMI	Male	2.99	pine	0	0	21	4	25	1389	84%	1.9

sRank	Pyear	Name	Gender	Area (acres)	Specie	WC	WS	Live	Dead	Total	Stock (stem/ha)	S-%	Hdom (metre)
76	2014/15	VENERANDA MTEWELE	Female	1.46	pine	1	1	20	4	24	1333	83%	1.1
77	2014/15	CLEMENCE CHENGULA	Male	1.31	pine	0	0	10	2	12	667	83%	1
78	2014/15	CYPRIAN MWEGUNE	Male	1.93	eucalyptus	0	0	15	3	18	1000	83%	3.1
79	2015/16	RUDGER MGENI	Male	17.37	eucalyptus	0	0	15	3	18	1000	83%	0.45
80	2014/15	AMANDUS CHILUMBA	Male	0.86	pine	0	0	19	4	23	1278	83%	1.5
81	2014/15	CONSTANSIA MGAYA	Female	2.45	pine	1	0	19	4	23	1278	83%	1.75
82	2014/15	ALBERTINA MUHENGA	Female	2.22	pine	0	0	14	3	17	944	82%	0.95
83	2014/15	CATHOLIC CHURCH			pine	0	0	21	5	26	1444	81%	2.2
84	2014/15	RENALD CHENGULA	Male	1.48	pine	1	0	15	4	19	1055	79%	1.55
85	2015/16	FELIX LYAGULA	Male	1.09	pine	1	1	15	4	19	1055	79%	1.05
86	2014/15	BETRONDA MGAYA	Male	2.30	pine	0	0	15	4	19	1055	79%	0.8
87	2014/15	PIUS LYAGULA	Male	1.95	eucalyptus	0	0	26	7	33	1833	79%	0.55
88	2015/16	WALTER LYAGULA	Male	1.56	pine	0	0	11	3	14	778	79%	0.2
89	2014/15	KELVIN KAHWILI	Male	5.49	pine	0	0	18	5	23	1278	78%	1.15
90	2014/15	MOSES NJOCHANKO	Male	1.09	pine	0	0	17	5	22	1222	77%	0.95
91	2014/15	YOLANDA MGAYA	Female		pine	1	1	20	6	26	1444	77%	1.9
92	2014/15	RUKIA DANDA	Female	3.29	pine	0	0	16	5	21	1166	76%	1.15
93	2014/15	ALBERTO MKALAWA	Male	2.99	pine	1	0	15	5	20	1111	75%	1.65
94	2014/15	KIFANYA SECONDARY		8.08	eucalyptus	1	1	9	3	12	667	75%	4
95	2014/15	FILOTEUS LWEKELA	Male	1.38	pine	1	0	14	5	19	1055	74%	1.7
96	2014/15	FILOTEUS LWEKELA	Male	30.84	eucalyptus	0	0	19	7	26	1444	73%	0.7
97	2014/15	JOHN MCHAMI	Male	2.45	pine	0	0	10	4	14	778	71%	0.55
98	2014/15	MARTIN MWIGUNE	Male		pine	0	0	15	6	21	1166	71%	1.45
99	2015/16	SELINA MVANDA	Female	1.63	pine	0	0	12	5	17	944	71%	0.5
100	2015/16	OCTAVIAN MAYEMBA	Male	7.46	pine	0	0	11	5	16	889	69%	0.1

sRank	Pyear	Name	Gender	Area (acres)	Specie	WC	WS	Live	Dead	Total	Stock (stem/ha)	S-%	Hdom (metre)
101	2014/15	TRIPHONIA LUKINJA	Female	2.30	eucalyptus	0	0	13	6	19	1055	68%	0.8
102	2014/15	FLORENTINA NGOLE	Female	1.63	pine	0	0	13	6	19	1055	68%	1.25
103	2015/16	GUSTAF MLYUKA	Male	12.33	eucalyptus	1	0	15	7	22	1222	68%	0.55
104	2015/16	FILOTEUS LWEKELA	Male	4.30	pine	0	0	12	6	18	1000	67%	1.5
105	2014/15	THADEI CHENGULA	Male		pine	0	0	10	5	15	833	67%	0.35
106	2015/16	KAMILUS NZENGE	Male	6.00	pine	1	1	10	5	15	833	67%	0.25
107	2014/15	CATHOLIC CHURCH		1.43	eucalyptus	1	1	8	4	12	667	67%	0.35
108	2014/15	SELINA MVANDA	Female	0.00	pine	0	0	9	5	14	778	64%	1.45
109	2014/15	SELINA MVANDA	Female	2.25	pine	0	0	9	5	14	778	64%	1.45
110	2014/15	CATHOLIC CHURCH		6.47	eucalyptus	0	1	9	5	14	778	64%	1.8
111	2014/15	OCTAVIAN MAYEMBA	Male	3.43	eucalyptus	1	0	10	6	16	889	63%	1
112	2014/15	JOHN WILOMO	Male	1.85	pine	0	0	3	2	5	278	60%	0.8
113	2015/16	OVIN MNGONGO	Male	4.08	eucalyptus	0	0	9	6	15	833	60%	0.25
114	2014/15	GUSTAVO MLYUKA	Male	28.12	eucalyptus	2	2	12	8	20	1111	60%	0.75
115	2015/16	ONESMO CHENGULA	Male	3.31	eucalyptus	1	0	10	8	18	1000	56%	0.2
116	2014/15	EPHROCINA CHATANDA	Female	2.62	pine	0	0	7	6	13	722	54%	0.55
117	2014/15	GEROD NYENGELA	Male	6.77	pine	0	0	7	8	15	833	47%	0.5
118	2014/15	COSMA MGENI	Male	1.63	pine	1	0	8	11	19	1055	42%	1.1
119	2014/15	ANORD MSAFIRI	Male	14.13	eucalyptus	0	0	6	9	15	833	40%	0.7
120	2014/15	KELVIN KAHWILI	Male	0.86	pine	0	0	7	12	19	1055	37%	0.4
121	2014/15	FILOTEUS LWEKELA	Male	20.58	eucalyptus	0	0	6	12	18	1000	33%	0.25
122	2015/16	KELVIN KAHWILI	Male	5.73	pine	0	0	6	14	20	1111	30%	0.25
123	2014/15	OVIN MNGONGO	Male	5.83	eucalyptus	0	0	3	8	11	611	27%	0.4
124	2014/15	RENALD CHENGULA	Male	1.06	eucalyptus	0	0	0	19	19	1055	0%	
125	2015/16	OVIN MNGONGO	Male	9.02	pine	0	0	0	20	20	1111	0%	

sRank	Pyear	Name	Gender	Area (acres)	Specie	WC	WS	Live	Dead	Total	Stock (stem/ha)	S-%	Hdom (metre)
126	2015/16	WALTER LYAGULA	Male	1.21							0		

Key:

sRank = Rank based on survival score
Name = Woodlot owner first and last name
Specie = tree type (name)
WS = Slash weeding
Dead = Dead seedling
Stock = Total number of seedling per hectare
Sdeath = Score for dead seedling

Pyear = Planting year
Area = Area of the woodlot in hectare
WC = Circle weeding
Live = Alive seedling
Total = Sum of seedling both dead and alive
s-% = Survival percentage
hdom = Average height of two dominant (tallest) tree

Annex 1

43. WOODLOT ASSESSMENT FIELD SURVEY FORM

Surveyors: _____ Date: _____

WOODLOT LOCATION & OWNERSHIP

44. Coordinates by GPS

45. GPS accuracy

--

46. Village: _____ District: _____

47. Woodlot owner Name, Phone number and ID number (if applicable):

48. Has the woodlot changed owner since establishment? No / Yes / Unknown

If Yes, fill in the original owner: _____

PLOT MEASUREMENTS

49. Number of trees alive in the plot

--

50. Number of trees dead in the plot

--

51. Total number of trees in the plot

--

52. Height of the plot tallest tree (in decimetres): _____ dm, Second tallest tree: _____ dm

53. In case there are dead trees, assess the likely main cause of death:

Suppression by weeds	<input type="checkbox"/>	Cattle trampling:	<input type="checkbox"/>
Fire damage	<input type="checkbox"/>	Drought stress:	<input type="checkbox"/>
Disease	<input type="checkbox"/>	Other:	<input type="checkbox"/>
Insect damage	<input type="checkbox"/>	(specify "Other" in remarks)	

GENERAL WOODLOT DATA

54. Species group: Pine / Eucalyptus / Teak

55. Level of circle weeding in the woodlot: _____

56. Level of slash weeding in the woodlot: _____

ADDITIONAL REMARKS BY SURVEYORS

--



End of Dry Season woodlot assessment 2016/17

End of Dry season survey feedback report for Lugema village

June 2016, Iringa, Tanzania



United Republic of Tanzania
**MINISTRY OF NATURAL RESOURCES
AND TOURISM**
Forestry and Beekeeping Division



**EMBASSY OF FINLAND
DAR ES SALAAM**

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LIST OF ANNEXES

Annex 1: Woodlot assessment field survey form

ABBREVIATIONS

GPS Global Positioning System
PFP Private Forestry Programme
TGIS Tree Growing Incentive Scheme

1. INTRODUCTION

1.1. Background

The Private Forestry Programme (PFP) is a Finnish funded development aid programme designed to run from 2014 to 2030. It increases wealth in the Southern Highlands by promoting commercial management of smallholder plantations and wood processing enterprises.

This field survey was carried out in 25 villages that have been supported in planting trees by PFP. The field work was done from December 2016 to February 2017. The purpose of the field work was to assess the performance and management of the woodlots. The results will be used by PFP to improve its support models in the future.

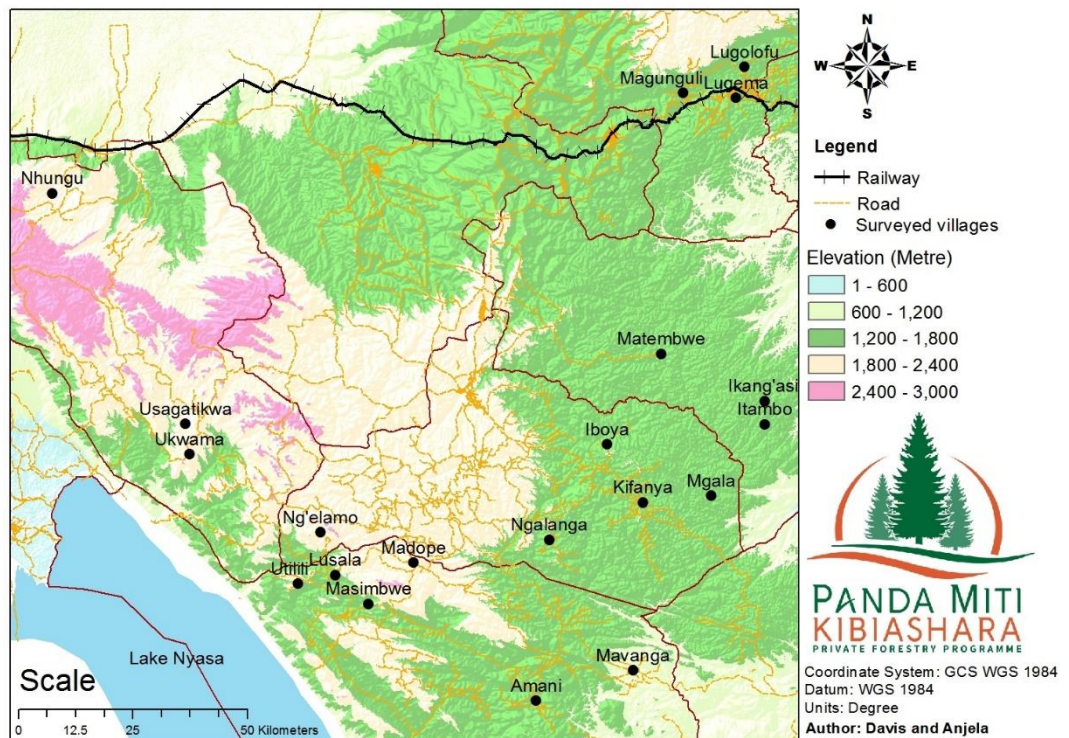
1.2. Objectives of the survey

- i. To assess the performance, survival, and level of management of the woodlots established through PFP support during the first two years of the programme.
- ii. To verify the status of the woodlots included in the PFP database.
- iii. To interview supported beneficiaries for collection of socioeconomic data.

2. LOCATION OF THE VILLAGE

Lugema village is situated between latitude $8^{\circ} 45'$ south and longitude $35^{\circ} 17'$ east. The village is found in the eastern highland areas of Mufindi district in Iringa region (Figure. 1). The elevation ranges between 1100m to 1400m a.s.l.

Figure 11: A map showing the location of Lugema village with respect to other surveyed villages



3. METHODOLOGY

3.1. Field procedures

The field teams conducted the following activities while surveying the woodlots:

- ✚ Navigating to the woodlots using GPS receiver and support from local TGA personnel
- ✚ Then, a rope of radius of 7.57m was used to define the boundary of a sample plot within the woodlot
- ✚ Within the sample plots, the number of live and dead seedlings were counted (Annex 1).
- ✚ Also the level of weeding was assessed as shown in Table 1
- ✚ Metal bar was inserted for the 2015/16 established woodlots, so that they can be found later with a metal detector if needed

Table 64 Classification for the level of weeding

Category/ Score	Title	Definition
0	No weeding done	There are practically no signs of weeding activities done during the past rainy season
1	Some weeding done, but not acceptably	There is clear evidence of weeding activities taken place during the past rainy season; however they have not been done sufficiently to ensure tree survival, good quality and good growth in the woodlot.
2	Weeding activities done acceptably	There are some shortcomings in the weeding activities, but the overall level is clearly sufficient to help ensure tree survival, good quality and good growth in the woodlot.
3	Weeding activities done completely	There are practically no signs of shortcomings, and all weeding activities appear to be conducted throughout the woodlot.

Key: The classification was reflected against the technical guidelines for circle and slash weeding as presented in the PFP TGIS guidelines. These require:

- Circle weeding: 50 cm radius to be cleared of weeds without damage to the tree in the middle.
- Slash weeding: all living weeds cut lower than 30 cm height.

It should be noted that no decisions of approval or disapproval for the level of weeding for support purposes were done in relation to this exercise.

3.2. Calculations and statistical analysis

- ✚ **Stand density (stems/ha):** the number of live trees plus number of dead trees in the sample plot, extended into a figure per hectare.
- ✚ **Survival percentage:** the share of live trees of the total number of trees in the sample plot.
- ✚ **Dominant height:** Average calculated from the two tallest tree heights measured in the sample plot. Assuming 3 x 3 m planting density, the figure represents the average height of the 100 tallest trees in a hectare.

3.3. Tools

- ✚ GPS receiver
- ✚ Smartphones installed with ODK collect tool
- ✚ PVC pipe and Rope of 7.57m radius
- ✚ Metal bar

4. RESULTS

4.1. Woodlots description

- ✚ A total of 18 woodlots owned by 15 beneficiaries surveyed (Table 2).
- ✚ The village surveyed woodlots comprised a total area of 200.95 acres supported by the programme through TGIS in kind (Table 2).

Table 65: Village total number and area of woodlots

Planting year/season	Beneficiaries	Number of woodlot	Total area (acres)
2015/16	Female	1	5.24
	Male	17	195.71
Grand Total		18	200.95

Key: Inst. & V.group = Institutions and vulnerable groups

4.2. Weeding

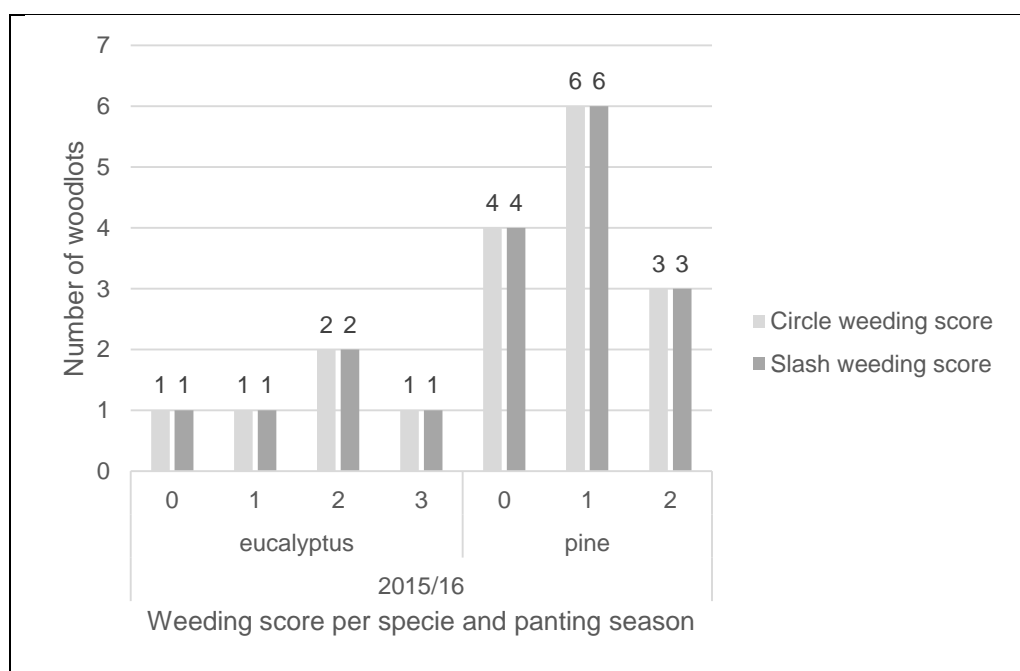
The observed score for both, circle and slash weeding were moderate (Table 3). The frequencies for assessed weeding scores are presented in Figure. 2.

Table 66 Mean circle weeding and slash weeding scores by species group and year of stand establishment

Planting year/season	Beneficiaries	Specie group	CW	SW
2015/16	Female	Eucalyptus	2.00	2.00
	Male	Eucalyptus	1.75	1.50
		Pine	1.23	0.92
Grand Total			1.39	1.11

Key: CW = Circular weeding SW = Slash weeding

Figure 12: Mean circle weeding and slash weeding scores by woodlots



4.3. Survival and stocking

4.3.1. Fire damage

Generally, at village level fire was not a major problem affecting survival of the tree seedling. Although, fire seems to be a major concern for the future development of the woodlots, hence mitigate measure are vital for sustainability of the woodlots.

4.3.2. Height growth

Lugema village mean dominant height was good as observed in Table 4.

Table 67: Mean dominant height description

Species group	2015/16	
	Hdom (metre)	
Eucalyptus		0.820
Pine		0.554
Grand total		0.628

Key: hdom = Dominant height

4.3.3. Survival and stocking

Table 5 below shows the general survival percentage and mean stocking of Lugema village. In general, the village average survival percentage was low, as compared to other villages (Table 6).

Table 68: Mean survival percentage description

Species group	2015/16	
	S-%	Stocking (stem/ha)
Pines	72%	1320
Eucalyptus	65%	1222
Grand total	70%	1293

Table 69: The rank of villages by average survival percentage

Village name	Average survival percentage	Rank
Matembwe	99%	1
Usagatikwa	95%	2
Kidabaga	95%	3
Lusala	90%	4
Kiyowela	89%	5
Ukwama	84%	6
Ngalanga	83%	7
Maguguli	83%	8
Madope	83%	9
Ng'elamo	82%	10
Kifanya	82%	11
Mavanga	82%	12
Ikang'asi	81%	13
Iboya	79%	14
Itambo	77%	15
Mgala	76%	16
Utilili	72%	17
Kiwalamo	72%	18
Lugema	70%	19
Lugolofu	69%	20
Amani	68%	21
Makungu	61%	22
Ukwega	59%	23
Masimbwe	54%	24
Nhungu	48%	25

4.4. Weeding

4.4.1. Circular weeding

Table 7 below shows the general circular weeding score for Lugema village. In general, the village average circular weeding score was high as compared to other villages (Table 8).

Table 70: Mean circular weeding score description

Specie group	WC
	2015/16
Pines	1.23
Eucalyptus	1.80
Grand total	1.39

Key: WC = Circular weeding scores,

Table 71: The rank of villages by average circular weeding score

Villages	Average circular weeding score	Rank
Usagatikwa	1.84	1
Matembwe	1.45	2
Lugema	1.39	3
Lugolofu	1.20	4
Kiyowela	1.10	5
Maguguli	1.04	6
Kiwalamo	0.96	7
Ukwega	0.83	8
Iboya	0.83	9
Mgala	0.82	10
Nhungu	0.76	11
Mavanga	0.76	12
Ukwama	0.63	13
Lusala	0.60	14
Makungu	0.52	15
Kifanya	0.44	16
Kidabaga	0.33	17
Itambo	0.32	18
Ikang'asi	0.27	19
Ng'elamo	0.21	20
Amani	0.15	21
Utilili	0.15	22
Ngalanga	0.06	23
Madope	0.01	24
Masimbwe	0.00	25

4.4.2. Slash weeding

Table 9 below shows the general slash weeding score for Lugema village. In general, the village average slash weeding score was high as compared to other villages (Table 10).

Table 72: Mean slash weeding score description

Specie group	WS
	2015/16
Pines	0.92
Eucalyptus	1.60
Grand total	1.11

Key: WS = Slash weeding score

Table 73: The rank of villages by average slash weeding score

Villages	Average slash weeding score	Rank
Kidabaga	2.00	1
Matembwe	1.73	2
Kiyowela	1.15	3
Mavanga	1.14	4
Lugema	1.11	5
Lusala	0.93	6
Maguguli	0.88	7
Kiwalamo	0.85	8
Ukwega	0.83	9
Makungu	0.76	10
Madope	0.66	11
Mgala	0.58	12
Usagatikwa	0.47	13
Kifanya	0.35	14
Lugolofu	0.35	15
Ukwama	0.34	16
Utilili	0.33	17
Ikang'asi	0.31	18
Itambo	0.30	19
Nhungu	0.27	20
Amani	0.26	21
Iboya	0.22	22
Ngalanga	0.11	23
Masimbwe	0.03	24
Ng'elamo	0.00	25

5. CONCLUSION AND RECOMMENDATION

Generally, the villagers are encouraged to increase effort in the woodlots management activities especially weeding, in order to obtain better survival, growth and quality of trees.

Results from the survey observed a slight correlation between the weeding and survival percentage of the woodlots in Lugema village. As described in Table 11, both, slash and circular weeding showed a strong negative and positive linear relationship to number of dead and live seedling respectively. This indicate that, woodlots with high weeding scores observed to have high number of live seedlings with less dead seedling.

Table 74: A correlation between weeding and survival score

Variable	Dead seedlings	Live seedlings
WC	-0.65	0.58
WS	-0.45	0.42

Key: WC = Circle weeding score

WS = Slash weeding score

To some extent this information evaluate the need for weeding to increase survival percentage of the seedling in the woodlots. If both slash and circular weeding are done perfectly, then one could reduce the number of dead seedling and increase/maintain the number of live seedling in a particular woodlot. Scientifically weeding is proven to be vital for the survival of tree seedlings, since it reduces competition over nutrients, air and light between tree seedlings and weeds.

6. RESULTS FOR EACH INDIVIDUAL WOODLOT

Table 12 below shows the results for each individual beneficiary woodlots. It includes:

- ✚ Weeding score: both circular and slash weeding score
- ✚ Stem density (stem/ha)
- ✚ Survival percentage

Table 75: Village woodlots results

sRank	Pyear	Name	Gender	Area (acres)	Specie	WC	WS	Live	Dead	Total	Stock (stem/ha)	S-%	Hdom (metre)
1	2015/16	LODRIGO MHEPELA	Male	4.20	pine	2	1	25	0	25	1388.668	100%	0.75
2	2015/16	MOHAMED KIPANDE	Male	7.56	pine	2	1	30	1	31	1721.948	97%	0.55
3	2015/16	MOHAMED KIPANDE	Male	1.16	pine	2	1	30	2	32	1777.495	94%	0.45
4	2015/16	SILVESTER MHEPELA	Male	7.41	pine	2	2	30	3	33	1833.042	91%	0.55
5	2015/16	GALUS HEPELWA	Male	0.69	pine	2	2	18	2	20	1110.934	90%	0.55
6	2015/16	HEMED MWAGALA	Male	38.13	pine	1	0	16	2	18	999.8408	89%	0.5
7	2015/16	TISSO MPONZI	Male	8.20	eucalyptus	2	2	16	3	19	1055.388	84%	0.55
8	2015/16	GALUS HEPELWA	Male	9.34	pine	0	0	20	4	24	1333.121	83%	0.35
9	2015/16	NOAH MFUTE	Male	12.75	eucalyptus	2	1	13	3	16	888.7474	81%	1.1
10	2015/16	FREDRICK KIBIKI	Male	1.43	eucalyptus	3	3	16	4	20	1110.934	80%	1.65
11	2015/16	ZAKARIA MGOWOLE	Male	6.57	pine	2	2	16	5	21	1166.481	76%	1
12	2015/16	SHIDA MPONZI	Female	5.24	eucalyptus	2	2	21	8	29	1610.855	72%	0.55
13	2015/16	FREDRICK KIBIKI	Male	2.22	pine	1	1	14	6	20	1110.934	70%	0.55
14	2015/16	TUMAEI KAYAGE	Male	25.75	pine	0	1	14	8	22	1222.028	64%	0.65
15	2015/16	LAURENT MHEPELA	Male	11.00	pine	1	1	9	8	17	944.2941	53%	0.55
16	2015/16	ZAKARIA MGOWOLE	Male	52.68	pine	1	0	6	12	18	999.8408	33%	0.55
17	2015/16	LAURENT HEPELWA	Male	5.98	eucalyptus	0	0	2	24	26	1444.215	8%	0.25
18	2015/16	AUSTIN HEPELWA	Male	0.62	pine	0	0	0	28	28	1555.308	0%	0.2

Key:

sRank	=	Rank based on survival score	Pyear	=	Planting year
Name	=	Woodlot owner first and last name	Area	=	Area of the woodlot in hectare
Specie	=	tree type (name)	WC	=	Circle weeding
WS	=	Slash weeding	Live	=	Alive seedling
Dead	=	Dead seedling	Total	=	Sum of seedling both dead and alive
Stock	=	Total number of seedling per hectare	s-%	=	Survival percentage
Sdeath	=	Score for dead seedling	hdom	=	Average height of two dominant (tallest) tree

Form Number:

Annex 1

7. WOODLOT ASSESSMENT FIELD SURVEY FORM

Surveyors: _____ Date: _____

WOODLOT LOCATION & OWNERSHIP

8. Coordinates by GPS

9. GPS accuracy

10. Village: _____ District: _____

11. Woodlot owner Name, Phone number and ID number (if applicable):

12. Has the woodlot changed owner since establishment? No / Yes / Unknown

If Yes, fill in the original owner: _____

PLOT MEASUREMENTS

13. Number of trees alive in the plot

14. Number of trees dead in the plot

15. Total number of trees in the plot

16. Height of the plot tallest tree (in decimetres): _____ dm, Second tallest tree: _____ dm

17. In case there are dead trees, assess the likely main cause of death:

- Suppression by weeds Cattle trampling:
Fire damage Drought stress:
Disease Other:
Insect damage (specify "Other" in remarks)

GENERAL WOODLOT DATA

18. Species group: Pine / Eucalyptus / Teak

19. Level of circle weeding in the woodlot: _____

20. Level of slash weeding in the woodlot: _____

Scale: 0 - No weeding done
1 - Some weeding done, but not acceptably
2 - Weeding activities done acceptably
3 - Weeding activities done completely

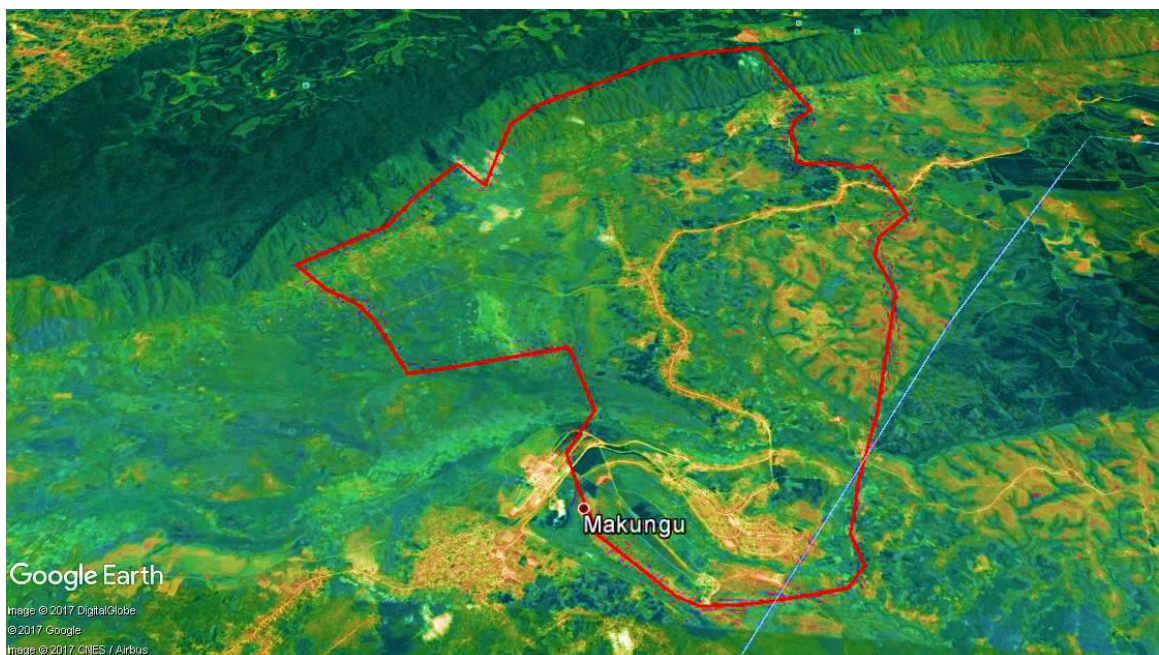
ADDITIONAL REMARKS BY SURVEYORS



End of Dry Season woodlot assessment 2016/17

End of Dry season survey feedback report for Lugolofu village

June 2016, Iringa, Tanzania



United Republic of Tanzania
**MINISTRY OF NATURAL RESOURCES
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**EMBASSY OF FINLAND
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LIST OF ANNEXES

Annex 1: Woodlot assessment field survey form

ABBREVIATIONS

GPS Global Positioning System
PFP Private Forestry Programme
TGIS Tree Growing Incentive Scheme

1. INTRODUCTION

1.1. Background

The Private Forestry Programme (PFP) is a Finnish funded development aid programme designed to run from 2014 to 2030. It increases wealth in the Southern Highlands by promoting commercial management of smallholder plantations and wood processing enterprises.

This field survey was carried out in 25 villages that have been supported in planting trees by PFP. The field work was done from December 2016 to February 2017. The purpose of the field work was to assess the performance and management of the woodlots. The results will be used by PFP to improve its support models in the future.

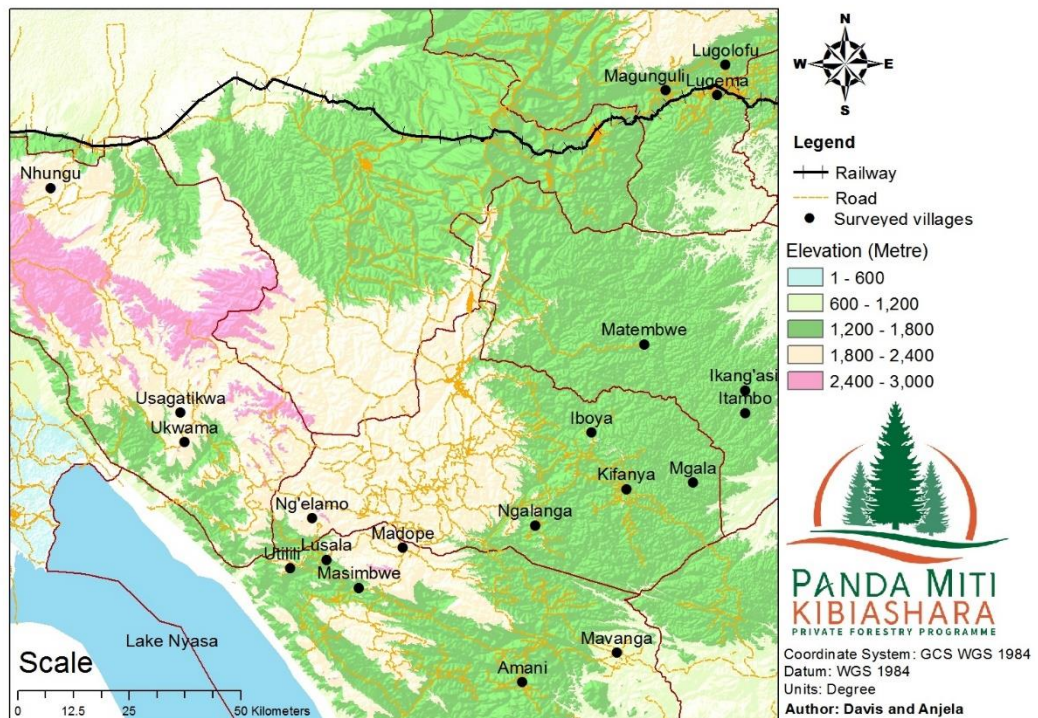
1.2. Objectives of the survey

- i. To assess the performance, survival, and level of management of the woodlots established through PFP support during the first two years of the programme.
- ii. To verify the status of the woodlots included in the PFP database.
- iii. To interview supported beneficiaries for collection of socioeconomic data.

2. LOCATION OF THE VILLAGE

Lugolofu village is situated between latitude 8° 41' south and longitude 35° 18' east. The village is found in the eastern highland areas of Mufindi district in Iringa region (Figure. 1). The elevation ranges between 1100m to 1400m a.s.l.

Figure 13: A map showing the location of Lugolofu village with respect to other surveyed villages



3. METHODOLOGY

3.1. Field procedures

The field teams conducted the following activities while surveying the woodlots:

- ✚ Navigating to the woodlots using GPS receiver and support from local TGA personnel
- ✚ Then, a rope of radius of 7.57m was used to define the boundary of a sample plot within the woodlot
- ✚ Within the sample plots, the number of live and dead seedlings were counted (Annex 1).
- ✚ Also the level of weeding was assessed as shown in Table 1
- ✚ Metal bar was inserted for the 2015/16 established woodlots, so that they can be found later with a metal detector if needed

Table 76 Classification for the level of weeding

Category/ Score	Title	Definition
0	No weeding done	There are practically no signs of weeding activities done during the past rainy season
1	Some weeding done, but not acceptably	There is clear evidence of weeding activities taken place during the past rainy season; however they have not been done sufficiently to ensure tree survival, good quality and good growth in the woodlot.
2	Weeding activities done acceptably	There are some shortcomings in the weeding activities, but the overall level is clearly sufficient to help ensure tree survival, good quality and good growth in the woodlot.
3	Weeding activities done completely	There are practically no signs of shortcomings, and all weeding activities appear to be conducted throughout the woodlot.

Key: The classification was reflected against the technical guidelines for circle and slash weeding as presented in the PFP TGIS guidelines. These require:

- Circle weeding: 50 cm radius to be cleared of weeds without damage to the tree in the middle.
- Slash weeding: all living weeds cut lower than 30 cm height.

It should be noted that no decisions of approval or disapproval for the level of weeding for support purposes were done in relation to this exercise.

3.2. Calculations and statistical analysis

- ✚ **Stand density (stems/ha):** the number of live trees plus number of dead trees in the sample plot, extended into a figure per hectare.
- ✚ **Survival percentage:** the share of live trees of the total number of trees in the sample plot.
- ✚ **Dominant height:** Average calculated from the two tallest tree heights measured in the sample plot. Assuming 3 x 3 m planting density, the figure represents the average height of the 100 tallest trees in a hectare.

3.3. Tools

- ✚ GPS receiver
- ✚ Smartphones installed with ODK collect tool
- ✚ PVC pipe and Rope of 7.57m radius
- ✚ Metal bar

4. RESULTS

4.1. Woodlots description

- ✚ A total of 98 woodlots owned by 88 beneficiaries surveyed (Table 2).
- ✚ The village surveyed woodlots comprised a total area of 199.22 acres supported by the programme through TGIS in kind (Table 2).

Table 77: Village total number and area of woodlots

Planting year/season	Beneficiaries	Number of woodlot	Total area (acres)
2015/16	Female	12	20.56
	Male	85	150.59
	Inst. & V.group	1	28.07
Grand Total		98	199.22

Key: Inst. & V.group = Institutions and vulnerable groups

4.2. Weeding

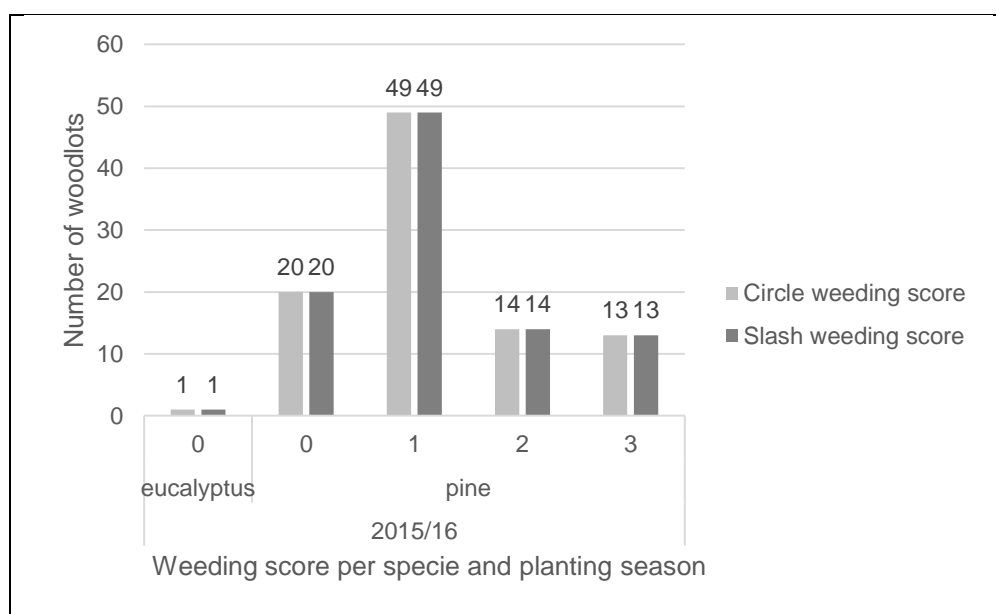
The observed score for both, circle and slash weeding were moderate (Table 3). The frequencies for assessed weeding scores are presented in Figure. 2.

Table 78 Mean circle weeding and slash weeding scores by species group and year of stand establishment

Planting year/season	Beneficiaries	Specie group	CW	SW
2015/16	Female	pine	1.00	0.08
	Male	Eucalyptus	0.00	0.00
		Pine	1.24	0.40
	Inst. & V.group	pine	1.00	0.00
Grand Total			1.20	0.35

Key: CW = Circular weeding SW = Slash weeding
Inst. & V.group = Institutions and vulnerable groups

Figure 14: Mean circle weeding and slash weeding scores by woodlots



4.3. Survival and stocking

4.3.1. Fire damage

Generally, at village level fire was not a major problem affecting survival of the tree seedling. Although, fire seems to be a major concern for the future development of the woodlots, hence mitigate measure are vital for sustainability of the woodlots.

4.3.2. Height growth

Lugolofu village mean dominant height was good as observed in Table 4.

Table 79: Mean dominant height description

Species group	2015/16	
	hdom (metre)	
Eucalyptus		0.300
Pine		0.516
Grand total		0.514

Key: hdom = Dominant height

4.3.3. Survival and stocking

Table 5 below shows the general survival percentage and mean stocking of Lugolofu village. In general, the village average survival percentage was low, as compared to other villages (Table 6).

Table 80: Mean survival percentage description

Species group	2015/16	
	S-%	Stocking (stem/ha)
Pines	69%	1444
Eucalyptus	35%	1159
Grand total	69%	1162

Table 81: The rank of villages by average survival percentage

Village name	Average survival percentage	Rank
Matembwe	99%	1
Usagatikwa	95%	2
Kidabaga	95%	3
Lusala	90%	4
Kiyowela	89%	5
Ukwama	84%	6
Ngalanga	83%	7
Maguguli	83%	8
Madope	83%	9
Ng'elamo	82%	10
Kifanya	82%	11
Mavanga	82%	12
Ikang'asi	81%	13
Iboya	79%	14
Itambo	77%	15
Mgala	76%	16
Utilili	72%	17
Kiwalamo	72%	18
Lugema	70%	19
Lugolofu	69%	20
Amani	68%	21
Makungu	61%	22
Ukwega	59%	23
Masimbwe	54%	24
Nhungu	48%	25

4.4. Weeding

4.4.1. Circular weeding

Table 7 below shows the general circular weeding score for Lugolofu village. In general, the village average circular weeding score was high as compared to other villages (Table 8).

Table 82: Mean circular weeding score description

Specie group	WC
	2015/16
Pines	1.21
Eucalyptus	0.001
Grand total	1.20

Key: WC = Circular weeding scores,

Table 83: The rank of villages by average circular weeding score

Villages	Average circular weeding score	Rank
Usagatikwa	1.84	1
Matembwe	1.45	2
Lugema	1.39	3
Lugolofu	1.20	4
Kiyowela	1.10	5
Maguguli	1.04	6
Kiwalamo	0.96	7
Ukwega	0.83	8
Iboya	0.83	9
Mgala	0.82	10
Nhungu	0.76	11
Mavanga	0.76	12
Ukwama	0.63	13
Lusala	0.60	14
Makungu	0.52	15
Kifanya	0.44	16
Kidabaga	0.33	17
Itambo	0.32	18
Ikang'asi	0.27	19
Ng'elamo	0.21	20
Amani	0.15	21
Utilili	0.15	22
Ngalanga	0.06	23
Madope	0.01	24
Masimbwe	0.00	25

4.4.2. Slash weeding

Table 9 below shows the general slash weeding score for Lugolofu village. In general, the village average slash weeding score was low as compared to other villages (Table 10).

Table 84: Mean slash weeding score description

Specie group	WS
	2015/16
Pines	0.35
Eucalyptus	0.00
Grand total	0.35

Key: WS = Slash weeding score

Table 85: The rank of villages by average slash weeding score

Villages	Average slash weeding score	Rank
Kidabaga	2.00	1
Matembwe	1.73	2
Kiyowela	1.15	3
Mavanga	1.14	4
Lugema	1.11	5
Lusala	0.93	6
Maguguli	0.88	7
Kiwalamo	0.85	8
Ukwegga	0.83	9
Makungu	0.76	10
Madope	0.66	11
Mgala	0.58	12
Usagatikwa	0.47	13
Kifanya	0.35	14
Lugolofu	0.35	15
Ukwama	0.34	16
Utilili	0.33	17
Ikang'asi	0.31	18
Itambo	0.30	19
Nhungu	0.27	20
Amani	0.26	21
Iboya	0.22	22
Ngalanga	0.11	23
Masimbwe	0.03	24
Ng'elamo	0.00	25

5. CONCLUSION AND RECOMMENDATION

Generally, the villagers are encouraged to increase effort in the woodlots management activities especially weeding, in order to obtain better survival, growth and quality of trees.

Results from the survey observed a slight correlation between the weeding and survival percentage of the woodlots in Lugolofu village. As described in Table 11, both, slash and circular weeding showed a strong negative and positive linear relationship to number of dead and live seedling respectively. This indicate that, woodlots with high weeding scores observed to have high number of live seedlings with less dead seedling.

Table 86: A correlation between weeding and survival score

Variable	Dead seedlings	Live seedlings
WC	-0.102	0.063
WS	-0.116	0.050

Key: WC = Circle weeding score WS = Slash weeding score

To some extent this information evaluate the need for weeding to increase survival percentage of the seedling in the woodlots. If both slash and circular weeding are done perfectly, then one could reduce the number of dead seedling and increase/maintain the number of live seedling in a particular woodlot. Scientifically weeding is proven to be vital for the survival of tree seedlings, since it reduces competition over nutrients, air and light between tree seedlings and weeds.

6. RESULTS FOR EACH INDIVIDUAL WOODLOT

Table 12 below shows the results for each individual beneficiary woodlots. It includes:

- ✚ Weeding score: both circular and slash weeding score
- ✚ Stem density (stem/ha)
- ✚ Survival percentage

Table 87: Village woodlots results

sRanks	Pyear	Name	Gender	Area (acres)	Specie	WC	WS	Live	Dead	Total	Stock (stem/ha)	S-%	Hdom (metre)
1	2015/16	JULIETA MNYAGANI	Female	2.37	pine	1	0				0		1.45
2	2015/16	ZENA NGILANGWA	Female	0.96	pine	1	0	21	0	21	1166	100%	0.45
3	2015/16	TIMOTHEO NYWAGE	Male	1.09	pine	3	2	24	0	24	1333	100%	0.55
4	2015/16	VALENZIA NYAHOVE	Male	0.72	pine	1	1	18	0	18	1000	100%	0.45
5	2015/16	PAUL NJAVIKE	Male	2.84	pine	1	0	20	0	20	1111	100%	0.8
6	2015/16	VALENCE SUTTA 2	Male	1.28	pine	0	0	19	0	19	1055	100%	0.35
7	2015/16	SEBASTIAN FYUMAGWA	Male	0.00	pine	3	1	12	0	12	667	100%	0.55
8	2015/16	DEVDIKA KAHEMELE	Male	2.10	pine	1	0	20	0	20	1111	100%	0.6
9	2015/16	PETER NGILANGWA	Male	1.09	pine	2	1	23	0	23	1278	100%	0.3
10	2015/16	ERICK NZAVIKE	Male	1.19	pine	3	2	22	0	22	1222	100%	0.7
11	2015/16	ANJELA TUKANO	Female	1.04	pine	1	0	25	0	25	1389	100%	0.55
12	2015/16	FLORA MFIHWA	Female	1.46	pine	0	0	21	1	22	1222	95%	0.55
13	2015/16	DALIANA NYAHOVE	Female	1.93	pine	1	0	20	1	21	1166	95%	0.55
14	2015/16	JOSEPH NGILANGWA	Male	1.38	pine	1	0	19	1	20	1111	95%	0.75
15	2015/16	AUSEBIO KIMBE	Male	0.84	pine	0	0	18	1	19	1055	95%	0.55
16	2015/16	ROMANUS NZAVIKE	Male	0.99	pine	1	0	17	1	18	1000	94%	0.75
17	2015/16	VINCENT KAHML	Male	3.51	pine	1	0	17	1	18	1000	94%	0.6
18	2015/16	ADOLF NGILANGWA	Male	2.69	pine		1	16	1	17	944	94%	0.55
19	2015/16	NESTUS NZAVIKE	Male	4.00	pine	2	1	24	2	26	1444	92%	
20	2015/16	ALEX KIWELE	Male	0.89	pine	1	0	22	2	24	1333	92%	0.55
21	2015/16	EVARIST KAHEMELE	Male	4.32	pine	1	0	20	2	22	1222	91%	0.4
22	2015/16	BATON KILONZILE	Male	2.57	pine	1	0	20	2	22	1222	91%	0.45
23	2015/16	BARAKA NYAHOVE	Male	1.26	pine	1	0	20	2	22	1222	91%	0.6
24	2015/16	EVARIST MKANYIPELELE	Male	4.03	pine	2	0	19	2	21	1166	90%	0.55
25	2015/16	ATHANAS KIBIKI	Male	1.11	pine	1	0	19	2	21	1166	90%	0.75

sRanks	Pyear	Name	Gender	Area (acres)	Specie	WC	WS	Live	Dead	Total	Stock (stem/ha)	S-%	Hdom (metre)
26	2015/16	EZRA MKUNGA	Male	1.36	pine	0	0	18	2	20	1111	90%	0.55
27	2015/16	MAWAZO KIHWELE	Male	1.16	pine	3	2	15	2	17	944	88%	0.55
28	2015/16	EITI KIMBE	Male	0.94	pine	2	0	20	3	23	1278	87%	0.55
29	2015/16	ADMIKA NZAVIKE	Male	2.22	pine	2	1	20	3	23	1278	87%	0.55
30	2015/16	GODFREY MDETA	Male	1.58	pine	1	1	19	3	22	1222	86%	0.75
31	2015/16	VALENCE SUTTA	Male	1.75	pine	0	0	19	3	22	1222	86%	0.45
32	2015/16	MATIBABU MHESI	Male	3.06	pine	1	0	17	3	20	1111	85%	0.35
33	2015/16	TIMOTHEO KIHWELE	Male	0.79	pine	0	0	17	3	20	1111	85%	0.65
34	2015/16	SEBASTIAN FYUMAGWA	Female	5.91	pine	3	1	22	4	26	1444	85%	0.55
35	2015/16	YUSTA NZAVIKE	Female	2.03	pine	1	0	22	4	26	1444	85%	0.55
36	2015/16	BROWN KAHEMELE	Male	1.61	pine	1	0	16	3	19	1055	84%	0.55
37	2015/16	MAKSENSIA MHUSA	Female	0.91	pine	0	0	20	4	24	1333	83%	0.55
38	2015/16	ZACHARIA KILONZILE	Male	7.56	pine	3	2	15	3	18	1000	83%	0.5
39	2015/16	AIZAK MSILWA	Male	0.86	pine	1	0	20	4	24	1333	83%	0.55
40	2015/16	LOMULODI UYOLE	Male	1.19	pine	2	1	20	4	24	1333	83%	0.65
41	2015/16	HASHIM KILONZILE PN	Male	1.68	pine	1	0	26	6	32	1777	81%	0.25
42	2015/16	ARISTIDA MSHUMBUSHI	Male	2.55	pine	0	0	17	4	21	1166	81%	0.35
43	2015/16	SABIAN MCHENGESI	Male	2.25	pine	1	0	21	5	26	1444	81%	0.75
44	2015/16	ANJELA TUKANO	Female	0.94	pine	1	0	16	4	20	1111	80%	0.45
45	2015/16	GODFREY MDETA	Male	1.93	pine	1	1	20	5	25	1389	80%	0.65
46	2015/16	EDSON NJAVIKE	Male	1.58	pine	0	0	20	5	25	1389	80%	0.65
47	2015/16	ERNEST KIMBE	Male	3.71	pine	0	1	19	5	24	1333	79%	0.35
48	2015/16	MUDDY KIMBE	Male	1.21	pine	3	1	15	4	19	1055	79%	0.5
49	2015/16	YUSUF MSILWA	Male	0.86	pine	0	0	18	5	23	1278	78%	0.45
50	2015/16	ONESMO KIHWELE	Male	2.30	pine	2	0	21	6	27	1500	78%	0.45
51	2015/16	GODFREY MOHELE	Male	2.15	pine	2	0	17	5	22	1222	77%	0.65

sRanks	Pyear	Name	Gender	Area (acres)	Specie	WC	WS	Live	Dead	Total	Stock (stem/ha)	S-%	Hdom (metre)
52	2015/16	ANTEDY SANGA	Male	1.09	pine	1	0	16	5	21	1166	76%	0.55
53	2015/16	JULIO KAHEMELE	Male	0.62	pine	2	0	16	5	21	1166	76%	0.65
54	2015/16	VALENZIA NYAHOVE	Female	0.00	pine	1	0	12	4	16	889	75%	0.55
55	2015/16	SEBASTIAN NYAHOVE	Male	2.17	pine	3	2	9	3	12	667	75%	0.3
56	2015/16	CLETUS MSILWA	Male	0.96	pine	0	0	17	6	23	1278	74%	0.6
57	2015/16	CHARLE MNYAGN	Male	2.05	pine	2	0	19	7	26	1444	73%	0.65
58	2015/16	LAZARO KINDOLE	Male	2.62	pine	2	0	16	6	22	1222	73%	0.55
59	2015/16	BONIFAS MWASEL	Male	3.14	pine	3	2	18	7	25	1389	72%	0.35
60	2015/16	KASSIM MKANYIPELELE	Male	1.06	pine	1	0	14	6	20	1111	70%	0.55
61	2015/16	ADOLF NGILANGWA	Male	2.22	pine	3	2	16	7	23	1278	70%	0.35
62	2015/16	EDSON NZAVIKE	Male	0.00	pine	1	0	11	5	16	889	69%	
63	2015/16	DENIS LUBAVA	Male	1.16	pine	3	2	15	7	22	1222	68%	0.65
64	2015/16	GEOFREY MSILWA	Male	0.64	pine	0	0	15	7	22	1222	68%	0.3
65	2015/16	PATRICK MFIHWA	Male	2.45	pine	2	0	10	5	15	833	67%	0.4
66	2015/16	AUGUSTINO KAHEMELE	Male	2.45	pine	1	0	14	7	21	1166	67%	0.6
67	2015/16	NOELINA MSILW	Female	1.88	pine	1	0	9	5	14	778	64%	0.6
68	2015/16	EDWARD MSILWA	Male	1.95	pine	1	0	12	7	19	1055	63%	0.6
69	2015/16	COLETHA MKUNG'A	Female	1.14	pine	1	0	11	7	18	1000	61%	0.35
70	2015/16	FESTO MSILWA	Male	1.80	pine	1	0	14	10	24	1333	58%	0.65
71	2015/16	JAILOS NYAGAWA	Male	2.00	pine	0	0	11	8	19	1055	58%	0.45
72	2015/16	JOSEPHAT NZAVIKE	Male	1.21	pine	1	0	12	9	21	1166	57%	0.35
73	2015/16	EDWIN KIMBE	Male	2.13	pine	0	0	10	8	18	1000	56%	0.55
74	2015/16	HAMIS NZAVIKE	Male	0.82	pine	1	0	18	16	34	1889	53%	0.35
75	2015/16	ADRIANO MSILWA	Male	1.21	pine	1	0	13	12	25	1389	52%	0.35
76	2015/16	DAUD KIMBE	Male	1.14	pine	0	0	9	9	18	1000	50%	0.55
77	2015/16	JOSEPH NGILANGWA	Male	2.15	pine	0	0	10	12	22	1222	45%	0.25

sRanks	Pyear	Name	Gender	Area (acres)	Specie	WC	WS	Live	Dead	Total	Stock (stem/ha)	S-%	Hdom (metre)
78	2015/16	ZAKAYO NZAVIKE	Male	0.57	pine	1	0	8	12	20	1111	40%	0.35
79	2015/16	STEPHAN NGILANGWA	Male	3.31	pine	1	0	9	14	23	1278	39%	0.35
80	2015/16	EZEKIEL KAHEMELE	Male	1.09	pine	1	0	9	15	24	1333	38%	0.3
81	2015/16	MILIAS MKAMYIPELELE	Male	1.98	pine	2	1	7	12	19	1055	37%	0.6
82	2015/16	LED KIMBE	Male	1.16	pine	1	0	5	9	14	778	36%	0.4
83	2015/16	LED KIMBE	Male	1.19	pine	0	0	6	11	17	944	35%	0.45
84	2015/16	NIKOLAUS NYASI	Male	1.83	eucalyptus	0	0	9	17	26	1444	35%	0.3
85	2015/16	HAMIDU MTONYA	Male	0.89	pine	3	2	4	8	12	667	33%	0.35
86	2015/16	ISACK NYAHOVE	Male	1.01	pine	1	0	6	13	19	1055	32%	0.3
87	2015/16	STANI KILONZILE	Male	1.21	pine	1	0	6	15	21	1166	29%	0.55
88	2015/16	STEVEN KILONZILE	Male	1.11	pine	0	0	6	15	21	1166	29%	0.5
89	2015/16	DEMO PLOT		2.87	pine	1	0	6	15	21	1166	29%	0.45
90	2015/16	HILARY KILONZILE	Male	2.55	pine	1	0	4	12	16	889	25%	0.55
91	2015/16	VULNERABLE GROUP		25.20	pine	1	0	5	18	23	1278	22%	0.45
92	2015/16	ISRAEL MKUNG'A	Male	4.25	pine	1	0	5	22	27	1500	19%	0.5
93	2015/16	DANIEL MHESI	Male	1.83	pine	1	0	4	18	22	1222	18%	0.4
94	2015/16	FRED MSILWA	Male	2.52	pine	2	1	3	16	19	1055	16%	0.35
95	2015/16	ISAYA NZAVIKE	Male	0.72	pine	1	0	3	17	20	1111	15%	0.45
96	2015/16	MATIBABU MHESI	Male	1.48	pine	3	2	2	23	25	1389	8%	0.35
97	2015/16	ABEL KAHEMELE	Male	1.56	pine	0	0	1	13	14	778	7%	0.6
98	2015/16	HEZRON MKONDA	Male	1.09	pine	1	0	0	21	21	1166	0%	

Key:

sRank = Rank based on survival score
Name = Woodlot owner first and last name
Specie = tree type (name)
WS = Slash weeding
Dead = Dead seedling
Stock = Total number of seedling per hectare
Sdeath = Score for dead seedling

Pyear = Planting year
Area = Area of the woodlot in hectare
WC = Circle weeding
Live = Alive seedling
Total = Sum of seedling both dead and alive
s-% = Survival percentage
hdom = Average height of two dominant (tallest) tree

Annex 1

7. WOODLOT ASSESSMENT FIELD SURVEY FORM

Surveyors: _____ Date: _____

WOODLOT LOCATION & OWNERSHIP

8. Coordinates by GPS

9. GPS accuracy

10. Village: _____ District: _____

11. Woodlot owner Name, Phone number and ID number (if applicable):

12. Has the woodlot changed owner since establishment? No / Yes / Unknown

If Yes, fill in the original owner: _____

PLOT MEASUREMENTS

13. Number of trees alive in the plot

14. Number of trees dead in the plot

15. Total number of trees in the plot

16. Height of the plot tallest tree (in decimetres): _____ dm, Second tallest tree: _____ dm

17. In case there are dead trees, assess the likely main cause of death:

- | | | | |
|----------------------|--------------------------|------------------------------|--------------------------|
| Suppression by weeds | <input type="checkbox"/> | Cattle trampling: | <input type="checkbox"/> |
| Fire damage | <input type="checkbox"/> | Drought stress: | <input type="checkbox"/> |
| Disease | <input type="checkbox"/> | Other: | <input type="checkbox"/> |
| Insect damage | <input type="checkbox"/> | (specify "Other" in remarks) | |

GENERAL WOODLOT DATA

18. Species group: Pine / Eucalyptus / Teak

19. Level of circle weeding in the woodlot: _____

20. Level of slash weeding in the woodlot: _____

Scale: 0 – No weeding done
1 – Some weeding done, but not acceptably
2 – Weeding activities done acceptably
3 – Weeding activities done completely

ADDITIONAL REMARKS BY SURVEYORS



End of Dry Season woodlot assessment 2016/17

End of Dry season survey feedback report for Lusala village

June 2017, Iringa, Tanzania



United Republic of Tanzania
**MINISTRY OF NATURAL RESOURCES
AND TOURISM**
Forestry and Beekeeping Division



**EMBASSY OF FINLAND
DAR ES SALAAM**

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LIST OF ANNEXES

Annex 1: Woodlot assessment field survey form

ABBREVIATIONS

GPS Global Positioning System
PFP Private Forestry Programme
TGIS Tree Growing Incentive Scheme

1. INTRODUCTION

1.1. Background

The Private Forestry Programme (PFP) is a Finnish funded development aid programme designed to run from 2014 to 2030. It increases wealth in the Southern Highlands by promoting commercial management of smallholder plantations and wood processing enterprises.

This field survey was carried out in 25 villages that have been supported in planting trees by PFP. The field work was done from December 2016 to February 2017. The purpose of the field work was to assess the performance and management of the woodlots. The results will be used by PFP to improve its support models in the future.

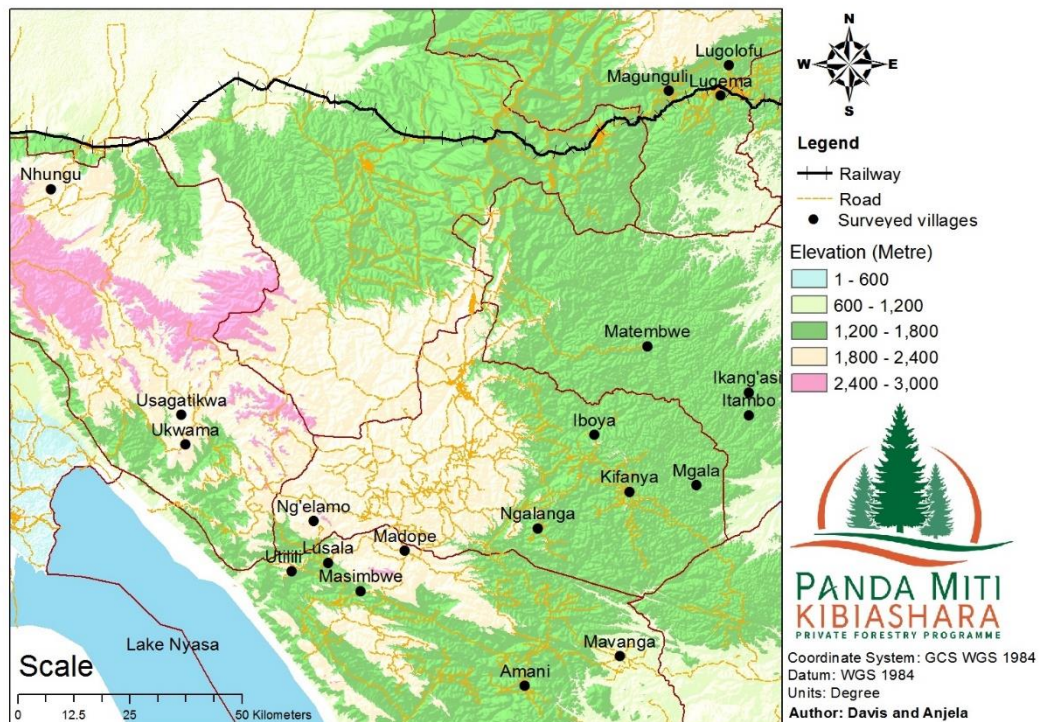
1.2. Objectives of the survey

- i. To assess the performance, survival, and level of management of the woodlots established through PFP support during the first two years of the programme.
- ii. To verify the status of the woodlots included in the PFP database.
- iii. To interview supported beneficiaries for collection of socioeconomic data.

2. LOCATION OF THE VILLAGE

Lusala village is situated between latitude 9° 41' south and longitude 34° 35' east. The village is found in the south eastern highland areas of Ludewa District in Njombe region (Figure. 1). The elevation ranges between 1600m to 2200m a.s.l.

Figure 15: A map showing the location of Lusala village with respect to other surveyed villages



3. METHODOLOGY

3.1. Field procedures

The field teams conducted the following activities while surveying the woodlots:

- ✚ Navigating to the woodlots using GPS receiver and support from local TGA personnel
- ✚ Then, a rope of radius of 7.57m was used to define the boundary of a sample plot within the woodlot
- ✚ Within the sample plots, the number of live and dead seedlings were counted (Annex 1).
- ✚ Also the level of weeding was assessed as shown in Table 1
- ✚ Metal bar was inserted for the 2015/16 established woodlots, so that they can be found later with a metal detector if needed.

Table 88 Classification for the level of weeding

Category/ Score	Title	Definition
0	No weeding done	There are practically no signs of weeding activities done during the past rainy season
1	Some weeding done, but not acceptably	There is clear evidence of weeding activities taken place during the past rainy season; however they have not been done sufficiently to ensure tree survival, good quality and good growth in the woodlot.
2	Weeding activities done acceptably	There are some shortcomings in the weeding activities, but the overall level is clearly sufficient to help ensure tree survival, good quality and good growth in the woodlot.
3	Weeding activities done completely	There are practically no signs of shortcomings, and all weeding activities appear to be conducted throughout the woodlot.

Key: The classification was reflected against the technical guidelines for circle and slash weeding as presented in the PFP TGIS guidelines. These require:

- Circle weeding: 50 cm radius to be cleared of weeds without damage to the tree in the middle.
- Slash weeding: all living weeds cut lower than 30 cm height.

It should be noted that no decisions of approval or disapproval for the level of weeding for support purposes were done in relation to this exercise.

3.2. Calculations and statistical analysis

- ✚ **Stand density (stems/ha):** the number of live trees plus number of dead trees in the sample plot, extended into a figure per hectare.
- ✚ **Survival percentage:** the share of live trees of the total number of trees in the sample plot.
- ✚ **Dominant height:** Average calculated from the two tallest tree heights measured in the sample plot. Assuming 3 x 3 m planting density, the figure represents the average height of the 100 tallest trees in a hectare.

3.3. Tools

- ✚ GPS receiver
- ✚ Smartphones installed with ODK collect tool
- ✚ PVC pipe and Rope of 7.57m radius
- ✚ Metal bar

4. RESULTS

4.1. Woodlots description

- A total of 198 woodlots owned by 99 beneficiaries surveyed (Table 2).
- The village surveyed woodlots comprised a total area of 323.26 acres supported by the programme through TGIS in kind (Table 2).

Table 89: Village total number and area of woodlots

Planting year/season	Beneficiaries	Number of woodlot	Total area (acres)
2014/15	Female	35	29.60
	Male	126	157.92
	Inst. &V.group	7	37.16
2015/16	Female	3	6.03
	Male	22	55.87
	Inst. &V.group	5	36.67
Grand Total		198	323.26

Key: Inst. &V.group = Institutions and vulnerable groups

4.2. Weeding

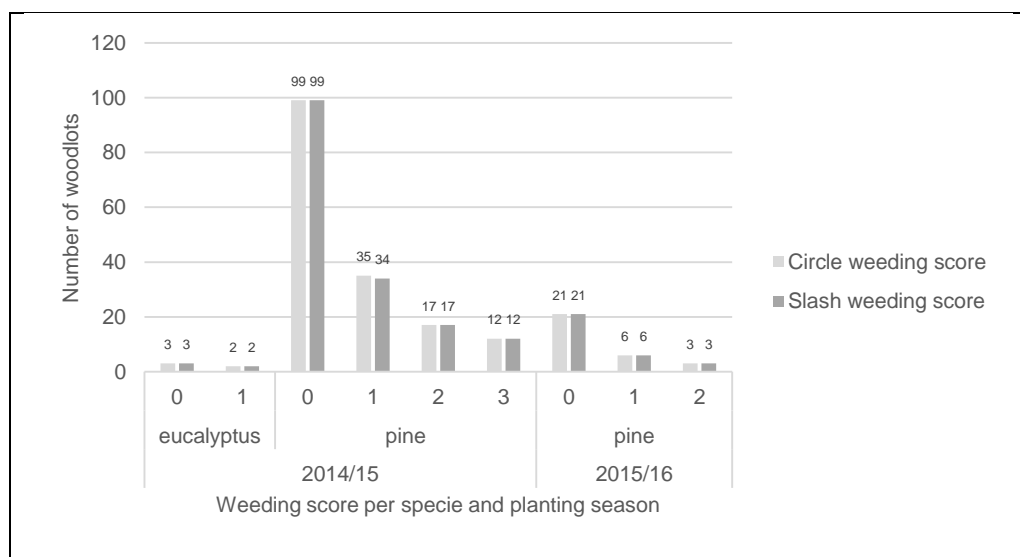
The observed score for both, circle and slash weeding were generally low (Table 3). The frequencies for assessed weeding scores are presented in Figure. 2.

Table 90 Mean circle weeding and slash weeding scores by specie group and year of stand establishment

Beneficiary	Specie group	Circle weeding		Slash weeding	
		2014/15	2015/16	2014/15	2015/16
Female	Pine	0.71	0.67	1.20	0.67
Male	Pine	0.66	0.45	0.97	0.59
	Eucalyptus	0.50	n/a	0.50	n/a
Inst. &V.group	Pine	0.00	0.00	0.83	0.40
	Eucalyptus	0.00	n/a	0.00	n/a
Grand total		0.64	0.40	0.99	0.57

Key: Inst. &V.group = Institutions and vulnerable groups

Figure 16: Mean circle weeding and slash weeding scores by woodlots



4.3. Survival and stocking

4.3.1. Fire damage

Generally, at village level fire was not a major problem affecting survival of the tree seedling. Although at individual woodlot level, fire seems to be a major concern for future development of the woodlots. . In Lusala village four woodlots were affected by fire (Table 4) hence mitigate measure are vital for sustainability of the woodlots.

Table 91: Description of the woodlot damaged by fire

S/N	Remarks	Number
1	Number of woodlots	4
2	Area (acres)	12.28

4.3.2. Height growth

Lusala village mean dominant height was good as observed in Table 5.

Table 92: Mean dominant height description

Specie group	hdom (metre)	
	2014/15	2015/16
Pines	0.21	0.05
Eucalyptus	0.23	n/a
Grand total	0.22	0.05

Key: hdom = Dominant height

4.3.3. Survival and stocking

Table 6 below shows the general survival percentage and mean stocking for Lusala village. In general, the village average survival percentage was low, as compared to other villages (Table 7).

Table 93: Mean survival percentage description

Specie group	2014/15		2015/16	
	S-%	Stock (stem/ha)	S-%	Stock (stem/ha)
Pines	94%	1018	72%	1037
Eucalyptus	94%	800	n/a	n/a
Grand total	94%	1011	72%	1037

Key: S-% = Survival percentage

Table 94: The rank of villages by average survival percentage

Village name	Average survival percentage	Rank
Matembwe	99%	1
Usagatikwa	95%	2
Kidabaga	95%	3
Lusala	90%	4
Kiyowela	89%	5
Ukwama	84%	6
Ngalanga	83%	7
Maguguli	83%	8
Madope	83%	9
Ng'elamo	82%	10
Kifanya	82%	11
Mavanga	82%	12
Ikang'asi	81%	13
Iboya	79%	14
Itambo	77%	15
Mgala	76%	16
Utilili	72%	17
Kiwalamo	72%	18
Lugema	70%	19
Lugolofu	69%	20
Amani	68%	21
Makungu	61%	22
Ukwega	59%	23
Masimbwe	54%	24
Nhungu	48%	25

4.4. Weeding

4.4.1. Circular weeding

Table 8 below shows the general circular weeding score for Lusala village. In general, the village average circular weeding score was low as compared to other villages (Table 9).

Table 95: Mean circular weeding score description

Specie group	Circle weeding score	
	2014/15	2015/16
Pines	0.64	0.40
Eucalyptus	0.40	n/a
Grand total	0.52	0.40

Table 96: The rank of villages by average circular weeding score

Villages	Average circular weeding score	Rank
Usagatikwa	1.84	1
Matembwe	1.45	2
Lugema	1.39	3
Lugolofu	1.20	4
Kiyowela	1.10	5
Maguguli	1.04	6
Kiwalamo	0.96	7
Ukwega	0.83	8
Iboya	0.83	9
Mgala	0.82	10
Nhungu	0.76	11
Mavanga	0.76	12
Ukwama	0.63	13
Lusala	0.60	14
Makungu	0.52	15
Kifanya	0.44	16
Kidabaga	0.33	17
Itambo	0.32	18
Ikang'asi	0.27	19
Ng'elamo	0.21	20
Amani	0.15	21
Utilili	0.15	22
Ngalanga	0.06	23
Madope	0.01	24
Masimbwe	0.00	25

4.4.2. Slash weeding

Table 10 below shows the general slash weeding score for Lusala village. In general, the village average slash weeding score was low as compared to other villages (Table 11).

Table 97: Mean slash weeding score description

Specie group	Slash weeding score	
	2014/15	2015/16
Pines	1.01	0.57
Eucalyptus	0.40	n/a
Grand total	0.99	0.57

Table 98: The rank of villages by average slash weeding score

Villages	Average slash weeding score	Rank
Kidabaga	2.00	1
Matembwe	1.73	2
Kiyowela	1.15	3
Mavanga	1.14	4
Lugema	1.11	5
Lusala	0.93	6
Maguguli	0.88	7
Kiwalamo	0.85	8
Ukwega	0.83	9
Makungu	0.76	10
Madope	0.66	11
Mgala	0.58	12
Usagatikwa	0.47	13
Kifanya	0.35	14
Lugolofu	0.35	15
Ukwama	0.34	16
Utilili	0.33	17
Ikang'asi	0.31	18
Itambo	0.30	19
Nhungu	0.27	20
Amani	0.26	21
Iboya	0.22	22
Ngalanga	0.11	23
Masimbwe	0.03	24
Ng'elamo	0.00	25

5. CONCLUSION AND RECOMMENDATION

Generally, the villagers are encouraged to increase effort in the woodlots management activities especially weeding, in order to obtain better survival, growth and quality of trees.

Results from the survey observed a slight correlation between the weeding and survival percentage of the woodlots in Lusala village. As described in Table 12, both, slash and circular weeding showed a negative and positive linear relationship to number of dead and live seedling respectively. This indicate that, woodlots with high weeding scores observed to have high number of live seedlings with less dead seedling.

Table 99: A correlation between weeding and survival score

Variable	Dead seedlings	Live seedlings
WC	-0.20	0.31
WS	-0.25	0.36

Key: WC = Circle weeding score WS = Slash weeding score

To some extent this information evaluate the need for weeding to increase survival percentage of the seedling in the woodlots. If both slash and circular weeding are done perfectly, then one could reduce the number of dead seedling and increase/maintain the number of live seedling in a particular woodlot. Scientifically weeding is proven to be vital for the survival of tree seedlings, since it reduces competition over nutrients, air and light between tree seedlings and weeds.

6. RESULTS FOR EACH INDIVIDUAL WOODLOT

Table 13 below shows the results for each individual beneficiary woodlots. It includes:

- ✚ Weeding score: both circular and slash weeding score
- ✚ Stem density (stem/ha)
- ✚ Survival percentage

Table 100: Village woodlots results

sRank	Pyear	Name	Gender	Area (acres)	Specie	WC	WS	Live	Dead	Total	Stock (stem/ha)	S-%	Hdom (metre)
1	2014/15	LEONARD MTEGA	male	0.91	pine	0	0	19	0	19	1055	100%	0.26
2	2014/15	JOSEPH MTEGA	male	3.46	pine	0	0	20	0	20	1111	100%	0.19
3	2014/15	MARTA MWINUKA	female	0.62	pine	0	0	11	0	11	611	100%	0.20
4	2014/15	ANGLICAN CHURCH		4.82	pine	0	1	21	0	21	1166	100%	0.45
5	2014/15	RENATUS NZIKU	male	2.79	pine	0	0	24	0	24	1333	100%	0.28
6	2014/15	RENATUS NZIKU	male	0.96	pine	0	0	18	0	18	1000	100%	0.21
7	2014/15	BITRIS MTEGA	female	0.25	pine	0	0	11	0	11	611	100%	0.16
8	2014/15	EMMANUEL KAYOMBO	male	0.67	pine	1		22	0	22	1222	100%	0.11
9	2014/15	HERBERT LUGOME	male	1.71	pine	1	0	14	0	14	778	100%	0.16
10	2014/15	HERIBERT LUGOME	male	1.98	pine	0	0	17	0	17	944	100%	0.30
11	2014/15	LUSALA PRIMARY SCHOOL		3.43	pine	0	2	23	0	23	1278	100%	0.31
12	2014/15	REMMY NZIKU	male	1.53	pine	1	3	19	0	19	1055	100%	0.29
13	2014/15	FELIX NZIKU	male	0.64	pine	2	1	22	0	22	1222	100%	0.29
14	2014/15	OCTAVIAN MSANGA	male	0.47	pine	1	1	18	0	18	1000	100%	0.25
15	2014/15	OCTAVIAN MSANGA	male	0.47	pine	0	0	26	0	26	1444	100%	0.24
16	2014/15	HILARY MSANGA	male	2.57	pine	2	2	21	0	21	1166	100%	0.24
17	2014/15	EDINA CHAULA	female	0.00	pine	1	1	21	0	21	1166	100%	0.28
18	2014/15	EDINA CHAULA	female	0.32	pine	1	1	17	0	17	944	100%	0.26
19	2014/15	EDINA CHAULA	female	0.62	pine	1	1	17	0	17	944	100%	0.23
20	2014/15	MAURUS KAYOMBO	male	0.69	pine	1	1	15	0	15	833	100%	0.22
21	2014/15	JANE NGAIRO	male	0.42	pine	1	1	15	0	15	833	100%	0.26
22	2014/15	ANUNZIATA MHAGAMA	female	1.43	pine	2	2	12	0	12	667	100%	0.28
23	2014/15	MAURUS KAYOMBO	male	1.04	pine	1	1	16	0	16	889	100%	0.20
24	2014/15	EDWARD MSANGA	male	0.72	pine	1	1	15	0	15	833	100%	0.20
25	2014/15	MAGNUS MGANWA	male	0.86	pine	0	1	22	0	22	1222	100%	0.22

sRank	Pyear	Name	Gender	Area (acres)	Specie	WC	WS	Live	Dead	Total	Stock (stem/ha)	S-%	Hdom (metre)
26	2014/15	MARTA MWINUKA	female	0.35	pine	3	3	18	0	18	1000	100%	0.37
27	2014/15	ALFRED MTEGA	male	0.30	pine	1	2	39	0	39	2166	100%	0.20
28	2014/15	EVODIA NZIKU	female	1.16	pine	0	0	20	0	20	1111	100%	0.27
29	2014/15	ELEUTERY MTEGA	male	1.88	pine	0	1	2	0	2	111	100%	0.18
30	2014/15	PAULA MTEGA	female	1.21	pine	0	3	21	0	21	1166	100%	0.15
31	2014/15	EVODIA NZIKU	female	0.69	pine	0	1	18	0	18	1000	100%	0.18
32	2014/15	AKSIO MTEGA	female	0.42	pine	0	3	20	0	20	1111	100%	0.23
33	2014/15	SEBASTIAN MTEGA	male	1.06	pine	2	3	22	0	22	1222	100%	0.24
34	2014/15	OCTAVIAN MSANGA	male	2.69	pine	0	0	24	0	24	1333	100%	0.18
35	2014/15	ROMAN CATHOLIC		2.05	pine	0	2	23	0	23	1278	100%	0.30
36	2014/15	AKASIO MTEGA	male	2.42	pine	0	2	21	0	21	1166	100%	0.21
37	2014/15	THADEI MTEGA	male	2.32	pine	2	2	20	0	20	1111	100%	0.12
38	2014/15	SEBASTIAN MTEGA	male	0.91	pine	2	3	19	0	19	1055	100%	0.24
39	2014/15	EFREM NGAIRO	male	0.49	eucalyptus	1	1	18	0	18	1000	100%	0.42
40	2014/15	HABILO MLELWA	male	2.47	pine	0	0	16	0	16	889	100%	0.21
41	2014/15	HENRIC MTEGA	male	1.93	pine	0	1	16	0	16	889	100%	0.20
42	2014/15	MICHAEL MTEGA	male	0.22	pine	2	2	17	0	17	944	100%	0.27
43	2014/15	MICHAEL MTEGA	male	0.49	pine	1	2	21	0	21	1166	100%	0.26
44	2014/15	HENRIC MTEGA	male	0.49	pine	0	0	17	0	17	944	100%	0.17
45	2014/15	PROTAS NGAIRO	male	1.46	pine	1	1	19	0	19	1055	100%	0.26
46	2014/15	VELMUND NGAIRO	male	2.55	pine	0	0	6	0	6	333	100%	0.12
47	2014/15	VELMUND NGAIRO	male	0.84	pine	0	0	8	0	8	444	100%	0.19
48	2014/15	HENRY MTEGA	male	4.45	pine	0	0	13	0	13	722	100%	0.14
49	2015/16	LUDEA		7.93	pine	0	2	13	0	13	722	100%	0.04
50	2014/15	REMMY NZIKU	male	0.52	eucalyptus	0	0	11	0	11	611	100%	0.35

sRank	Pyear	Name	Gender	Area (acres)	Specie	WC	WS	Live	Dead	Total	Stock (stem/ha)	S-%	Hdom (metre)
51	2014/15	AVITHO MTEGA	male	0.52	pine	3	1	17	0	17	944	100%	0.18
52	2014/15	REMMY NZIKU	male	0.74	pine	2	2	16	0	16	889	100%	0.15
53	2014/15	DESDELIUS MGANI	male	0.82	pine	0	3	21	0	21	1166	100%	0.28
54	2014/15	FELIX NZIKU	male	0.30	pine	1	2	19	0	19	1055	100%	0.16
55	2014/15	ALBENTINA MTEGA	female	0.99	pine	1	3	21	0	21	1166	100%	0.32
56	2014/15	ISLAEL KAMNYOGE	male	1.09	pine	2	2	19	0	19	1055	100%	0.20
57	2014/15	WINFRID MLUWILI	male	1.04	pine	1	2	18	0	18	1000	100%	0.21
58	2014/15	EFREM NGAIRO	male	1.58	pine	1	1	16	0	16	889	100%	0.23
59	2014/15	NORBERT MTEGA	male	0.64	pine	0	1	20	0	20	1111	100%	0.25
60	2014/15	ELEUTERY MTEGA	male	0.74	pine	0	0	19	0	19	1055	100%	0.18
61	2014/15	AKASIO MTEGA	male	0.47	pine	0	1	16	0	16	889	100%	0.41
62	2014/15	THADE MTEGA	male	1.48	pine	0	0	14	0	14	778	100%	0.19
63	2014/15	TRIPHON MTEGA	male	1.88	pine	0	0	12	0	12	667	100%	0.14
64	2014/15	TRIPHON MTEGA	male	1.80	pine	0	0	17	0	17	944	100%	0.21
65	2014/15	RIZIK CHAULA	male	0.79	pine	0	0	17	0	17	944	100%	0.26
66	2014/15	IKULUNGILO PRIMARY SCHOOL		8.50	pine	0	0	17	0	17	944	100%	0.22
67	2014/15	SEBASTIAN MTEGA	male	0.52	pine	1	1	15	0	15	833	100%	0.13
68	2014/15	EIENEUS NZIKU	male	1.38	pine	0	2	18	0	18	1000	100%	0.26
69	2014/15	PHILIPO MWINUKA	male	1.83	pine	0	1	20	0	20	1111	100%	0.32
70	2014/15	RENATUS NZIKU	male	0.42	pine	0	2	20	0	20	1111	100%	0.27
71	2014/15	DESDELIUS MGANI	male	0.37	pine	3	2	20	0	20	1111	100%	0.26
72	2014/15	ANGELA MGANWA	female	0.72	pine	0	1	18	0	18	1000	100%	0.17
73	2014/15	JOHN MLUWILI	male	1.09	pine	1	1	17	0	17	944	100%	0.24
74	2014/15	ADREHEM MTEGA	male	1.31	pine	0	0	13	0	13	722	100%	0.19
75	2014/15	LAURENT T MTEGA	male	0.89	pine	2	2	20	0	20	1111	100%	0.16

sRank	Pyear	Name	Gender	Area (acres)	Specie	WC	WS	Live	Dead	Total	Stock (stem/ha)	S-%	Hdom (metre)
76	2014/15	WALDO KILUMILE	male	0.94	pine	2	1	19	0	19	1055	100%	0.17
77	2014/15	MARIA MHAGAMA	female	0.86	pine	1	1	9	0	9	500	100%	0.17
78	2014/15	BITRIS MTEGA	female	0.69	pine	3	3	17	0	17	944	100%	0.32
79	2014/15	MARTA MWINUKA	female	0.40	pine	0	0	10	0	10	555	100%	0.22
80	2014/15	DOMINICA NZIKU	female	0.84	pine	0	1	20	0	20	1111	100%	0.18
81	2014/15	AKWILINO MLUWILI	female	1.14	pine	3	3	20	0	20	1111	100%	0.19
82	2014/15	PRIMIN MTEGA	male	0.96	pine	3	3	20	0	20	1111	100%	0.25
83	2014/15	ADREHEM MTEGA	male	1.09	pine	3	3	16	0	16	889	100%	0.32
84	2014/15	MARTA MWINUKA	female	0.67	pine	0	1	18	0	18	1000	100%	0.26
85	2014/15	GEOFFREY MGAYA	male	1.21	pine	0	1	24	0	24	1333	100%	0.21
86	2014/15	MUSA CHAULA	male	0.84	pine	0	0	15	0	15	833	100%	0.13
87	2014/15	EDWARD MSANGA	male	0.32	pine	2	2	14	0	14	778	100%	0.22
88	2014/15	BITRIS MTEGA	female	0.69	pine	0	1	17	0	17	944	100%	0.19
89	2014/15	LUPYANA MDEGE	male	0.44	pine	0	0	20	0	20	1111	100%	0.21
90	2014/15	MAURUS KAYOMBO	male		pine	1	1	27	0	27	1500	100%	0.32
91	2014/15	ERENEUS NZIKU	male	1.71	pine	3	3	23	0	23	1278	100%	0.21
92	2014/15	REMMY NZIKU	male	2.17	pine	0	0	21	0	21	1166	100%	0.30
93	2014/15	VICTORIA MSANGA	female	1.36	pine	0	1	21	0	21	1166	100%	0.17
94	2014/15	LUSTIKA NZIKU	female	1.21	pine	0	0	17	0	17	944	100%	0.14
95	2014/15	LEZLE CHAULA	male	1.43	pine	0	0	21	0	21	1166	100%	0.17
96	2014/15	LUPYANA MDEGE	male	1.26	pine	1	0	23	0	23	1278	100%	0.21
97	2014/15	KLIAN NZIKU	male	0.49	pine	1	1	23	0	23	1278	100%	0.32
98	2014/15	OCTAVIAN NZIKU	male	1.31	pine	1	1	22	0	22	1222	100%	0.17
99	2014/15	INNOCENT CHAULA	male	0.74	pine	1	2	21	0	21	1166	100%	0.30
100	2014/15	INNOCENT CHAULA	male	0.64	pine	2	2	20	0	20	1111	100%	0.28

sRank	Pyear	Name	Gender	Area (acres)	Specie	WC	WS	Live	Dead	Total	Stock (stem/ha)	S-%	Hdom (metre)
101	2014/15	EIENEUS NZIKU	male	0.52	pine	1	0	20	0	20	1111	100%	0.24
102	2014/15	DANLOD MLELWA	male	4.15	pine	1	0	22	0	22	1222	100%	0.20
103	2014/15	DOMINICUS MGANWA	male	1.28	pine	0	0	15	0	15	833	100%	0.19
104	2014/15	LUSTIKA NZIKU	female	0.57	pine	3	3	21	0	21	1166	100%	0.23
105	2014/15	LUSALA PRIMARY SCHOOL		0.64	eucalyptus	0	0	17	0	17	944	100%	0.09
106	2014/15	ALBENTINA MTEGA	female	0.52	pine	0	1	23	0	23	1278	100%	0.24
107	2014/15	WINFRID MLELWA	male	1.88	pine	0	1	18	0	18	1000	100%	0.22
108	2014/15	TASLHO MTEGA	male	1.16	pine	0	0	17	0	17	944	100%	0.15
109	2014/15	HERIBERT LUGOME	male	1.51	pine	0	0	13	0	13	722	100%	0.19
110	2014/15	EVODIA NZIKU	female	0.77	pine	0	0	14	0	14	778	100%	0.19
111	2014/15	HERIBERT LOGOME	male	1.53	pine	0	0	12	0	12	667	100%	0.15
112	2014/15	FLOWIN MGAYA	male	1.68	pine	3	3	37	0	37	2055	100%	0.18
113	2015/16	VICENT MTEGA	male	2.67	pine	0	0	17	0	17	944	100%	0.06
114	2015/16	AVITHO MTEGA	male	1.06	pine	0	0	20	0	20	1111	100%	0.08
115	2015/16	ODILO CHAULA	male	2.82	pine	0	0	21	0	21	1166	100%	0.05
116	2015/16	LUPYANA MDEGE	male	1.09	pine	1	1	23	0	23	1278	100%	0.05
117	2014/15	MICHAEL MTEGA	male	0.62	pine	0	1	22	0	22	1222	100%	0.32
118	2014/15	NATHAN MTEGA	male	4.20	pine	2	0	23	0	23	1278	100%	0.23
119	2014/15	MARTA MWINUKA	female	0.67	pine	0	0	9	0	9	500	100%	0.27
120	2014/15	REBEKA CHAULA	female	0.94	pine	0	1	17	0	17	944	100%	0.23
121	2014/15	CLIMENTINA KAYOMBO	female	1.56	pine	1	0	16	0	16	889	100%	0.13
122	2015/16	EZEKIEL CHAULA	male	0.64	pine	1	1	23	0	23	1278	100%	0.06
123	2014/15	ALFRED MTEGA	male	0.59	pine	1	1	25	1	26	1444	96%	0.30
124	2014/15	OCTAVIA NZIKU	male	0.35	pine	2	1	25	1	26	1444	96%	0.19
125	2014/15	NORBERT MTEGA	male	0.20	pine	0	1	22	1	23	1278	96%	0.28

sRank	Pyear	Name	Gender	Area (acres)	Specie	WC	WS	Live	Dead	Total	Stock (stem/ha)	S-%	Hdom (metre)
126	2014/15	KLIAN P MTEGA	male	1.33	pine	0	1	22	1	23	1278	96%	0.10
127	2014/15	RENATUS NZIKU	male	1.31	pine	2	1	21	1	22	1222	95%	0.24
128	2014/15	RIZIK CHAULA	male	0.42	pine	0	2	20	1	21	1166	95%	0.23
129	2014/15	ELEUTERY MTEGA	male	0.57	pine	0	0	20	1	21	1166	95%	0.10
130	2015/16	EZEKIEL CHAULA	male	0.59	pine	2	2	20	1	21	1166	95%	0.06
131	2015/16	INNOCENT CHAULA	male	3.29	pine	2	2	20	1	21	1166	95%	0.04
132	2014/15	JOSEPH MSIGARA	male	0.96	pine	0	2	20	1	21	1166	95%	0.18
133	2014/15	ADREHEM MTEGA	male	0.67	pine	1	0	19	1	20	1111	95%	0.22
134	2014/15	REMMY NZIKU	male	0.10	pine	0	0	19	1	20	1111	95%	0.15
135	2014/15	JOHN MLUWILI	male	0.79	pine	0	1	18	1	19	1055	95%	0.23
136	2014/15	ADREHEM NGAIRO	male	2.55	pine	3	0	18	1	19	1055	95%	0.14
137	2014/15	ROTHAD MTEGA	male	0.94	pine	0	1	17	1	18	1000	94%	0.26
138	2014/15	AGNES NZIKU	female	2.05	pine	0	1	16	1	17	944	94%	0.30
139	2014/15	KOTRIDA MTEGA	female	1.36	pine	1	1	15	1	16	889	94%	0.15
140	2014/15	NORBET MTEGA	male	2.08	pine	0	1	15	1	16	889	94%	0.26
141	2014/15	JOSEPH MTEGA	male	2.55	pine	0	0	15	1	16	889	94%	0.19
142	2014/15	EFREM NGAIRO	male	1.31	pine	0	0	14	1	15	833	93%	0.18
143	2014/15	RENWTUS NZIKU	male	0.52	eucalyptus	0	0	13	1	14	778	93%	0.26
144	2015/16	PELAGIA MLELWA	female	1.98	pine	2	2	19	2	21	1166	90%	0.04
145	2014/15	SABAS MGANI	male	1.88	pine	1	0	18	2	20	1111	90%	0.09
146	2014/15	ELGIUS CHAULA	male	1.38	pine	0	3	18	2	20	1111	90%	0.20
147	2014/15	ROMAN CATHO		16.80	pine	0	0	18	2	20	1111	90%	0.18
148	2014/15	HILMARY MHAGAMA	male	0.57	pine	1	1	18	2	20	1111	90%	0.31
149	2014/15	CHRISPINE MTEGA	male	0.64	pine	0	1	18	2	20	1111	90%	0.26
150	2014/15	SILVESTER NZIKU	male	0.72	pine	0	1	17	2	19	1055	89%	0.22

sRank	Pyear	Name	Gender	Area (acres)	Specie	WC	WS	Live	Dead	Total	Stock (stem/ha)	S-%	Hdom (metre)
151	2014/15	AKASIO MTEGA	male	0.91	pine	0	1	16	2	18	1000	89%	0.19
152	2014/15	SYPRIAN MTEGA	male	0.86	pine	0	2	16	2	18	1000	89%	0.20
153	2014/15	ALBENTINA NZIKU	female	1.11	pine	1	0	16	2	18	1000	89%	0.30
154	2014/15	ELIGIUS CHAULA N	male	2.27	pine	2	2	15	2	17	944	88%	0.13
155	2014/15	AVITHO MTEGA	male	0.35	pine	0	2	15	2	17	944	88%	0.14
156	2014/15	FROLIAN MTEGA	male	0.47	pine	0	0	15	2	17	944	88%	0.17
157	2014/15	PAULA MTEGA	female	0.64	pine	3	3	15	2	17	944	88%	0.15
158	2014/15	MARIA MHAGAMA	female	1.14	pine	0	2	12	2	14	778	86%	0.27
159	2014/15	OCTAVIAN NZIKU	male	0.47	pine	0	1	17	3	20	1111	85%	0.17
160	2015/16	RENATUS NZIKU	male	3.61	pine	0	1	15	3	18	1000	83%	0.08
161	2014/15	HILMARY MHAGAMA	male	0.64	pine	0	2	15	3	18	1000	83%	0.21
162	2014/15	ODILA MLUWILI	male	6.67	pine	0	2	14	3	17	944	82%	0.08
163	2015/16	HABILO MLELWA	male	1.21	pine	0	0	18	4	22	1222	82%	0.06
164	2014/15	LEONARD MTEGA	male	0.59	pine	0	1	13	3	16	889	81%	0.11
165	2015/16	AGNES NZIKU	female	2.87	pine	0	0	12	3	15	833	80%	0.06
166	2014/15	MODESTER MGENI	female	1.11	pine	0	0	11	3	14	778	79%	0.10
167	2015/16	FLORIAN MTEGA	male	0.99	pine	0	1	11	3	14	778	79%	0.04
168	2015/16	AVITHO MTEGA	male	0.57	pine	0	1	11	3	14	778	79%	0.05
169	2014/15	RIZIKI CHAULA	male	0.57	pine	0	1	14	4	18	1000	78%	0.17
170	2015/16	LUDEA		2.50	pine	0	0	14	4	18	1000	78%	0.04
171	2015/16	DANFORD NZIKU	male	6.03	pine	1	1	17	5	22	1222	77%	0.05
172	2015/16	INNOCENT CHAULA	male	3.39	pine	0	0	17	5	22	1222	77%	0.04
173	2014/15	RIZIK CHAULA	male	0.91	pine	0	1	12	4	16	889	75%	0.13
174	2014/15	DOMINICUS MGANWA	male	2.82	eucalyptus	1	1	9	3	12	667	75%	0.05
175	2015/16	IKULUNGILO PRIMARY SCHOOL		5.21	pine	0	0	15	6	21	1166	71%	0.07

sRank	Pyear	Name	Gender	Area (acres)	Specie	WC	WS	Live	Dead	Total	Stock (stem/ha)	S-%	Hdom (metre)
176	2015/16	NAFTARY MWINUKA	male	1.95	pine	1	0	17	7	24	1333	71%	0.05
177	2014/15	FRORIAN MTEGA	male	1.21	pine	0	0	14	6	20	1111	70%	0.15
178	2015/16	AKWILINO MLUWILI	male	6.13	pine	1	2	12	6	18	1000	67%	0.03
179	2015/16	DANLOD MLELWA	male	2.52	pine	0	0	8	4	12	667	67%	0.06
180	2015/16	LEZLE CHAULA	male	3.14	pine	0	0	16	8	24	1333	67%	0.05
181	2015/16	AKASIO MTEGA	male	1.56	pine	0	0	12	6	18	1000	67%	0.04
182	2014/15	WINFRID MLELWA	male	1.68	pine	0	1	9	5	14	778	64%	0.13
183	2014/15	MARIA MHAGAMA	female	0.54	pine	0	0	8	5	13	722	62%	0.15
184	2014/15	PATRICK MLELWA	male	4.03	pine	0	0	12	8	20	1111	60%	0.07
185	2014/15	DEMO PLOT		0.91	pine	0	0	3	2	5	278	60%	0.06
186	2014/15	GERMANUS NZIKU	male	0.74	pine	0	0	11	8	19	1055	58%	0.06
187	2015/16	EZEKIEL CHAULA	male	1.90	pine	0	0	8	6	14	778	57%	0.03
188	2014/15	EMANUEL KAYOMBO	male		pine	0	1	8	8	16	889	50%	0.10
189	2015/16	JACOBO MSANGA	female	1.19	pine	0	0	8	9	17	944	47%	0.03
190	2015/16	PATRICK MLELWA	male	1.36	pine	0	0	6	9	15	833	40%	0.03
191	2014/15	WINFRID MLUWILI	male	0.77	pine	0	0	4	8	12	667	33%	0.15
192	2015/16	VULNERABLE GROUP		19.50	pine	0	0	5	10	15	833	33%	0.04
193	2015/16	IKULUNGILO PRIMARY SCHOOL		1.53	pine	0	0	5	14	19	1055	26%	0.03
194	2015/16	EFREM NGAIRO	male	1.11	pine	0	0	5	15	20	1111	25%	0.06
195	2015/16	DITRICK MTEGA	male	8.25	pine	1	1	1	17	18	1000	6%	0.03
196	2014/15	ELGIUS CHAULA	male	1.80	pine	0	0	0	21	21	1166	0%	
197	2014/15	OCTAVIAN MSANGA	male	1.36	pine	0	0	0	20	20	1111	0%	
198	2014/15	KLIAN NZIKU	male	1.19	pine	0	0	0	20	20	1111	0%	

Key:

sRank = Rank based on survival score
Name = Woodlot owner first and last name
Specie = tree type (name)
WS = Slash weeding
Dead = Dead seedling
Stock = Total number of seedling per hectare
Sdeath = Score for dead seedling

Pyear = Planting year
Area = Area of the woodlot in hectare
WC = Circle weeding
Live = Alive seedling
Total = Sum of seedling both dead and alive
s-% = Survival percentage
hdom = Average height of two dominant (tallest) tree

Form Number:

Annex 1

1. WOODLOT ASSESSMENT FIELD SURVEY FORM

Surveyors: _____ Date: _____

WOODLOT LOCATION & OWNERSHIP

2. Coordinates by GPS

3. GPS accuracy

4. Village: _____ District: _____

5. Woodlot owner Name, Phone number and ID number (if applicable):

6. Has the woodlot changed owner since establishment? No / Yes / Unknown

If Yes, fill in the original owner: _____

PLOT MEASUREMENTS

7. Number of trees alive in the plot

8. Number of trees dead in the plot

9. Total number of trees in the plot

10. Height of the plot tallest tree (in decimetres): _____ dm, Second tallest tree: _____ dm

11. In case there are dead trees, assess the likely main cause of death:

Suppression by weeds

Cattle trampling:

Fire damage

Drought stress:

Disease

Other:

Insect damage

(specify "Other" in remarks)

GENERAL WOODLOT DATA

12. Species group: Pine / Eucalyptus / Teak

Scale: 0 – No weeding done
1 – Some weeding done, but not acceptably

13. Level of circle weeding in the woodlot: _____

14. Level of slash weeding in the woodlot: _____

2 – Weeding activities done acceptably
3 – Weeding activities done completely

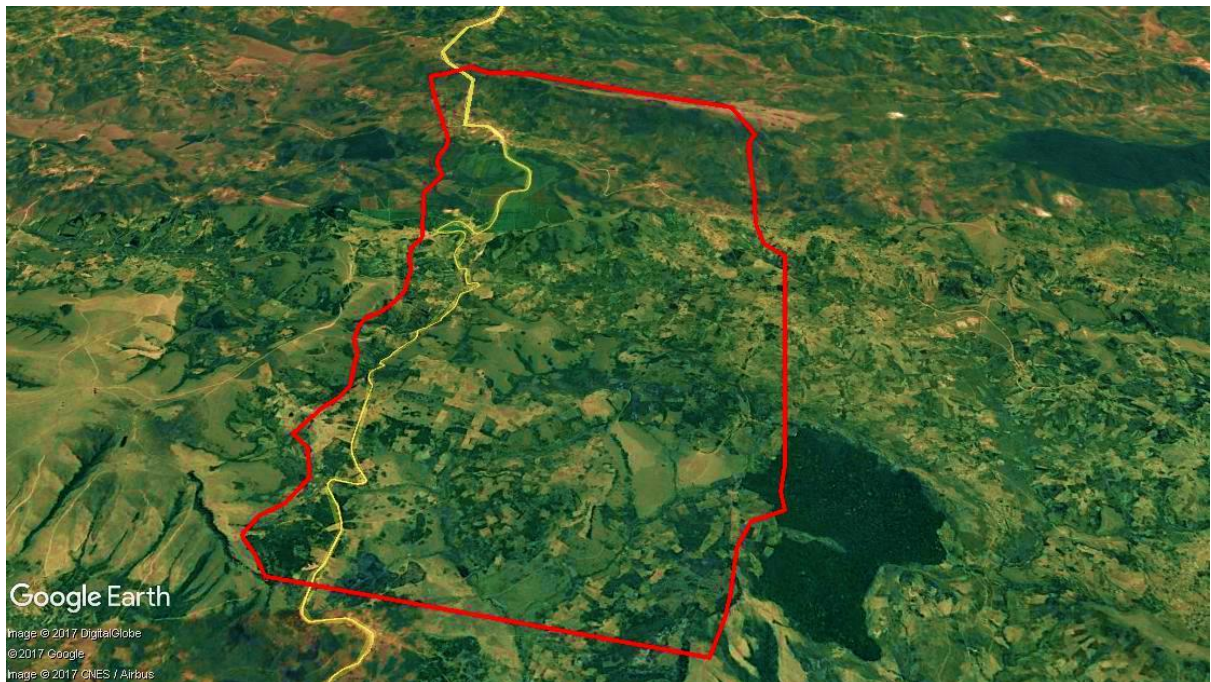
ADDITIONAL REMARKS BY SURVEYORS



End of Dry Season woodlot assessment 2016/17

End of Dry season survey feedback report for Madope village

June 2016, Iringa, Tanzania



United Republic of Tanzania
**MINISTRY OF NATURAL RESOURCES
AND TOURISM**
Forestry and Beekeeping Division



**EMBASSY OF FINLAND
DAR ES SALAAM**

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LIST OF ANNEXES

Annex 1: Woodlot assessment field survey form

ABBREVIATIONS

GPS	Global Positioning System
PFP	Private Forestry Programme
TGIS	Tree Growing Incentive Scheme

1. INTRODUCTION

1.1. Background

The Private Forestry Programme (PFP) is a Finnish funded development aid programme designed to run from 2014 to 2030. It increases wealth in the Southern Highlands by promoting commercial management of smallholder plantations and wood processing enterprises.

This field survey was carried out in 25 villages that have been supported in planting trees by PFP. The field work was done from December 2016 to February 2017. The purpose of the field work was to assess the performance and management of the woodlots. The results will be used by PFP to improve its support models in the future.

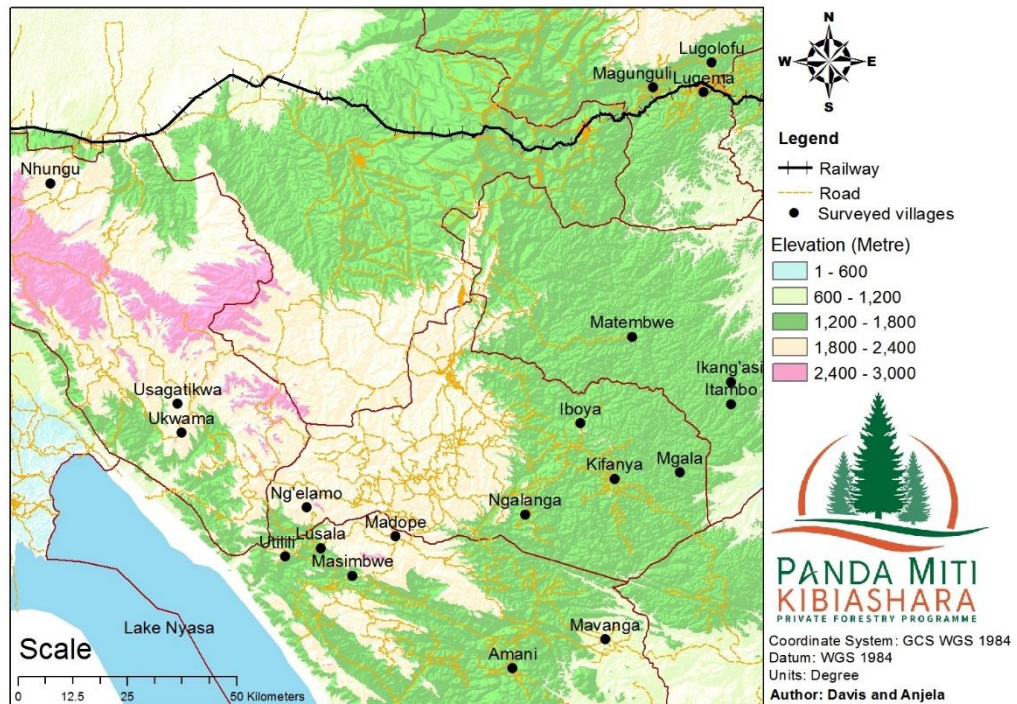
1.2. Objectives of the survey

- i. To assess the performance, survival, and level of management of the woodlots established through PFP support during the first two years of the programme.
- ii. To verify the status of the woodlots included in the PFP database.
- iii. To interview supported beneficiaries for collection of socioeconomic data.

2. LOCATION OF THE VILLAGE

Madope village is situated between latitude 9° 39' south and longitude 34° 39' east. The village is found in the south eastern highland areas of Ludewa district in Njombe region and it is characterised as wet intermediate agro ecological zone (Figure. 1). The elevation ranges between 1200m to 2200m a.s.l.

Figure 17: A map showing the location of Madope village with respect to other surveyed villages



3. METHODOLOGY

3.1. Field procedures

The field teams conducted the following activities while surveying the woodlots:

- ✚ Navigating to the woodlots using GPS receiver and support from local TGA personnel
- ✚ Then, a rope of radius of 7.57m was used to define the boundary of a sample plot within the woodlot
- ✚ Within the sample plots, the number of live and dead seedlings were counted (Annex 1).
- ✚ Also the level of weeding was assessed as shown in Table 1
- ✚ Metal bar was inserted for the 2015/16 established woodlots, so that they can be found later with a metal detector if needed

Table 101 Classification for the level of weeding

Category/ Score	Title	Definition
0	No weeding done	There are practically no signs of weeding activities done during the past rainy season
1	Some weeding done, but not acceptably	There is clear evidence of weeding activities taken place during the past rainy season; however they have not been done sufficiently to ensure tree survival, good quality and good growth in the woodlot.
2	Weeding activities done acceptably	There are some shortcomings in the weeding activities, but the overall level is clearly sufficient to help ensure tree survival, good quality and good growth in the woodlot.
3	Weeding activities done completely	There are practically no signs of shortcomings, and all weeding activities appear to be conducted throughout the woodlot.

Key: The classification was reflected against the technical guidelines for circle and slash weeding as presented in the PFP TGIS guidelines. These require:

- Circle weeding: 50 cm radius to be cleared of weeds without damage to the tree in the middle.
- Slash weeding: all living weeds cut lower than 30 cm height.

It should be noted that no decisions of approval or disapproval for the level of weeding for support purposes were done in relation to this exercise.

3.2. Calculations and statistical analysis

- ✚ **Stand density (stems/ha):** the number of live trees plus number of dead trees in the sample plot, extended into a figure per hectare.
- ✚ **Survival percentage:** the share of live trees of the total number of trees in the sample plot.
- ✚ **Dominant height:** Average calculated from the two tallest tree heights measured in the sample plot. Assuming 3 x 3 m planting density, the figure represents the average height of the 100 tallest trees in a hectare.

3.3. Tools

- ✚ GPS receiver
- ✚ Smartphones installed with ODK collect tool
- ✚ PVC pipe and Rope of 7.57m radius
- ✚ Metal bar

4. RESULTS

4.1. Woodlots description

- A total of 146 woodlots owned by 122 beneficiaries surveyed (Table 2).
- The village surveyed woodlots comprised a total area of 443.51 acres supported by the programme through TGIS in kind (Table 2).

Table 102: Village total number and area of woodlots

Planting year/season	Beneficiaries	Number of woodlot	Total area (acres)
2015/16	Female	37	85.94
	Male	99	236.41
	Inst. & V.group	10	121.16
Grand Total		146	443.51

Key: Inst. & V.group = Institutions and vulnerable groups

4.2. Weeding

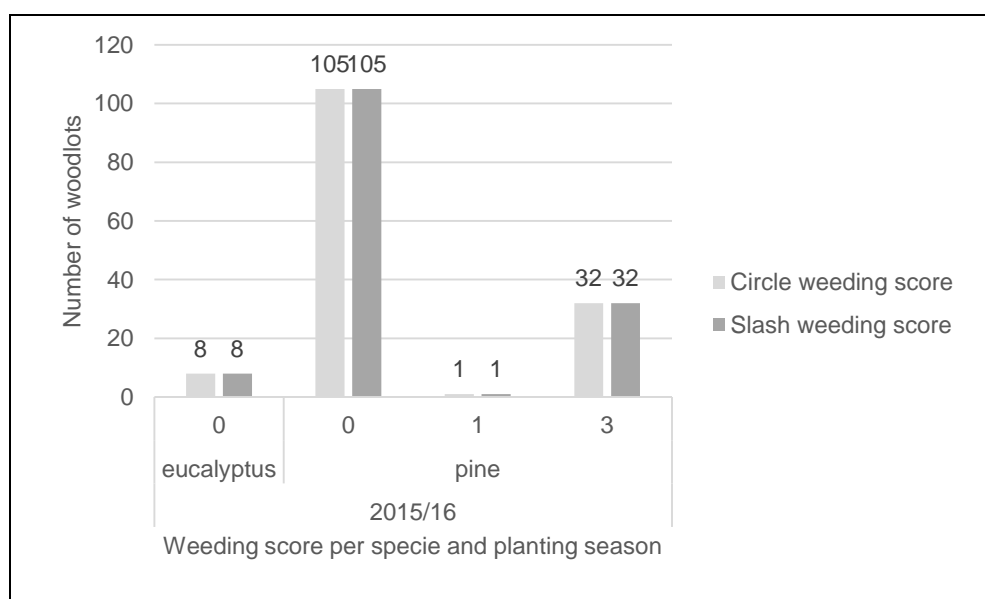
The observed score for both, circle and slash weeding were low (Table 3). The frequencies for assessed weeding scores are presented in Figure. 2.

Table 103 Mean circle weeding and slash weeding scores by species group and year of stand establishment

Planting year/season	Beneficiaries	Specie group	CW	SW
2015/16	Female	pine	0.06	0.94
		Eucalyptus	0.00	0.00
	Male	Pine	0.00	0.62
		Eucalyptus	0.00	0.00
	Inst. & V.group	pine	0.00	0.60
Grand Total			0.01	0.66

Key: CW = Circular weeding SW = Slash weeding
Inst. & V.group = Institutions and vulnerable groups

Figure 18: Mean circle weeding and slash weeding scores by woodlots



4.3. Survival and stocking

4.3.1. Fire damage

Generally, at village level fire was not a major problem affecting survival of the tree seedling. Although, fire seems to be a major concern for the future development of the woodlots, hence mitigate measure are vital for sustainability of the woodlots.

4.3.2. Height growth

Madope village mean dominant height was good as observed in Table 4.

Table 104: Mean dominant height description

Species group	2015/16	
	hdom (metre)	
Eucalyptus		0.26
Pine		0.31
Grand total		0.29

Key: hdom = Dominant height

4.3.3. Survival and stocking

Table 5 below shows the general survival percentage and mean stocking of Madope village. In general, the village average survival percentage was low, as compared to other villages (Table 6).

Table 105: Mean survival percentage description

Species group	2015/16	
	S-%	Stocking (stem/ha)
Pines	83%	1118
Eucalyptus	83%	1080
Grand total	83%	1082

Table 106: The rank of villages by average survival percentage

Village name	Average survival percentage	Rank
Matembwe	99%	1
Usagatikwa	95%	2
Kidabaga	95%	3
Lusala	90%	4
Kiyowela	89%	5
Ukwama	84%	6
Ngalanga	83%	7
Maguguli	83%	8
Madope	83%	9
Ng'elamo	82%	10
Kifanya	82%	11
Mavanga	82%	12
Ikang'asi	81%	13
Iboya	79%	14
Itambo	77%	15
Mgala	76%	16
Utilili	72%	17
Kiwalamo	72%	18
Lugema	70%	19
Lugolofu	69%	20
Amani	68%	21
Makungu	61%	22
Ukwega	59%	23
Masimbwe	54%	24
Nhungu	48%	25

4.4. Weeding

4.4.1. Circular weeding

Table 7 below shows the general circular weeding score for Madope village. In general, the village average circular weeding score was low as compared to other villages (Table 8).

Table 107: Mean circular weeding score description

Specie group	WC
	2015/16
Pines	0.01
Eucalyptus	0.00
Grand total	0.01

Key: WC = Circular weeding scores,

Table 108: The rank of villages by average circular weeding score

Villages	Average circular weeding score	Rank
Usagatikwa	1.84	1
Matembwe	1.45	2
Lugema	1.39	3
Lugolofu	1.20	4
Kiyowela	1.10	5
Maguguli	1.04	6
Kiwalamo	0.96	7
Ukwega	0.83	8
Iboya	0.83	9
Mgala	0.82	10
Nhungu	0.76	11
Mavanga	0.76	12
Ukwama	0.63	13
Lusala	0.60	14
Makungu	0.52	15
Kifanya	0.44	16
Kidabaga	0.33	17
Itambo	0.32	18
Ikang'asi	0.27	19
Ng'elamo	0.21	20
Amani	0.15	21
Utilili	0.15	22
Ngalanga	0.06	23
Madope	0.01	24
Masimbwe	0.00	25

4.4.2. Slash weeding

Table 9 below shows the general slash weeding score for Madope village. In general, the village average slash weeding score was low as compared to other villages (Table 11).

Table 109: Mean slash weeding score description

Specie group	WC
	2015/16
Pines	0.70
Eucalyptus	0.001
Grand total	0.66

Key: WS = Slash weeding score

Table 110: The rank of villages by average slash weeding score

Villages	Average slash weeding score	Rank
Kidabaga	2.00	1
Matembwe	1.73	2
Kiyowela	1.15	3
Mavanga	1.14	4
Lugema	1.11	5
Lusala	0.93	6
Maguguli	0.88	7
Kiwalamo	0.85	8
Ukwega	0.83	9
Makungu	0.76	10
Madope	0.66	11
Mgala	0.58	12
Usagatikwa	0.47	13
Kifanya	0.35	14
Lugolofu	0.35	15
Ukwama	0.34	16
Utilili	0.33	17
Ikang'asi	0.31	18
Itambo	0.30	19
Nhungu	0.27	20
Amani	0.26	21
Iboya	0.22	22
Ngalanga	0.11	23
Masimbwe	0.03	24
Ng'elamo	0.00	25

5. CONCLUSION AND RECOMMENDATION

Generally, the villagers are encouraged to increase effort in the woodlots management activities especially weeding, in order to obtain better survival, growth and quality of trees.

Results from the survey observed a slight correlation between the weeding and survival percentage of the woodlots in Madope village. As described in Table 11, both, slash and circular weeding showed a strong negative and positive linear relationship to number of dead and live seedling respectively. This indicate that, woodlots with high weeding scores observed to have high number of live seedlings with less dead seedling.

Table 111: A correlation between weeding and survival score

Variable	Dead seedlings	Live seedlings
WC	-0.075	0.029
WS	-0.11	0.11

Key: WC = Circle weeding score

WS = Slash weeding score

To some extent this information evaluate the need for weeding to increase survival percentage of the seedling in the woodlots. If both slash and circular weeding are done perfectly, then one could reduce the number of dead seedling and increase/maintain the number of live seedling in a particular woodlot. Scientifically weeding is proven to be vital for the survival of tree seedlings, since it reduces competition over nutrients, air and light between tree seedlings and weeds.

6. RESULTS FOR EACH INDIVIDUAL WOODLOT

Table 12 below shows the results for each individual beneficiary woodlots. It includes:

- ✚ Weeding score: both circular and slash weeding score
- ✚ Stem density (stem/ha)
- ✚ Survival percentage

Table 112: Village woodlots results

sRanks	Gender	Pyear	Name	Area (acres)	Specie	WC	WS	Live	Dead	Total	Stock (stem/ha)	S-%	Hdom (metre)
1		2015/16	LUTHERAN CHURCH	2.00	pine	0	0	17	0	17	944	100%	0.2
2	Female	2015/16	ADELINA MHAGAMA	1.71	pine	0	0	20	0	20	1111	100%	0.45
3	Female	2015/16	FLORA MTWEVE	7.49	pine	0	0	18	0	18	1000	100%	0.45
4	Male	2015/16	LUKA MBIGI	0.86	pine	0	3	13	0	13	722	100%	0.25
5	Male	2015/16	CASTORY MGAYA	0.62	pine	0	0	18	0	18	1000	100%	0.25
6	Male	2015/16	ANTON MWANGALACHUMA	5.61	pine	0	0	20	0	20	1111	100%	0.55
7		2015/16	ROMAN CATHOLIC	2.47	pine	0	0	20	0	20	1111	100%	0.55
8	Female	2015/16	ANES THONYA	5.41	pine	0	0	19	0	19	1055	100%	0.8
9	Female	2015/16	TATU MWIGUNE	0.52	pine	0	0	16	0	16	889	100%	0.4
10	Male	2015/16	JUMA NGANWA	0.64	eucalyptus	0	0	19	0	19	1055	100%	0.45
11	Male	2015/16	FEDRICK KAYOMBO	1.06	pine	0	0	19	0	19	1055	100%	0.35
12	Male	2015/16	FADHL MSIGWA	1.04	pine	0	0	32	0	32	1777	100%	0.35
13	Male	2015/16	ELIA KAYOMBO	0.49	pine	0	0	17	0	17	944	100%	0.2
14		2015/16	KAYAO SCHOOL	12.95	pine	0	0	16	0	16	889	100%	0.9
15	Male	2015/16	PATRICK MGAYA	1.63	pine	0	0	16	0	16	889	100%	1.65
16	Male	2015/16	PHILIP MGAYA	0.62	pine	0	0	19	0	19	1055	100%	0.2
17	Male	2015/16	ERENEUS MLELW	0.77	pine	0	0	20	0	20	1111	100%	0.3
18	Female	2015/16	EZRA THONYA	0.00	pine	0	0	18	0	18	1000	100%	0.9
19	Female	2015/16	ANTELMA MTEGA	1.06	pine	0	3	17	0	17	944	100%	0.25
20	Female	2015/16	ELINA MLELWA	43.71	pine	0	0	28	1	29	1611	97%	0.55
21	Female	2015/16	ZUENA KIDUMBI	0.67	pine	0	0	22	1	23	1278	96%	0.45
22	Male	2015/16	DEOGRASIAS NYONGEZA	2.57	pine	0	3	21	1	22	1222	95%	0.2
23	Male	2015/16	PATRICK MBATA	1.04	pine	0	3	21	1	22	1222	95%	0.4
24	Male	2015/16	PATENO MWAGENI	0.86	pine	0	0	20	1	21	1166	95%	0.25
25	Male	2015/16	ABDIAS MGAYA	0.74	pine	0	0	20	1	21	1166	95%	0.15

sRanks	Gender	Pyear	Name	Area (acres)	Specie	WC	WS	Live	Dead	Total	Stock (stem/ha)	S-%	Hdom (metre)
26	Female	2015/16	OLIVA MHADISA	1.09	pine	0	0	19	1	20	1111	95%	0.35
27	Male	2015/16	ANDREA MTULO	18.53	pine	0	0	19	1	20	1111	95%	0.95
28	Male	2015/16	EGNO MTITU	0.47	pine	0	0	19	1	20	1111	95%	0.2
29	Male	2015/16	GELHAD MWALONGO	0.52	pine	0	0	18	1	19	1055	95%	0.35
30	Male	2015/16	VINCENT MGAYA	0.54	pine	0	0	18	1	19	1055	95%	0.35
31	Female	2015/16	HAPPY MGAYA	0.44	pine	0	3	18	1	19	1055	95%	0.2
32	Female	2015/16	CONBELL TONYA	0.62	pine	1	3	18	1	19	1055	95%	0.35
33	Male	2015/16	IBRAHIM MLELWA	0.00	pine	0	0	17	1	18	1000	94%	0.25
34	Female	2015/16	AULERIA MGIMBA	1.14	pine	0	0	17	1	18	1000	94%	0.25
35	Female	2015/16	FREDA MTITU	0.62	pine	0	3	17	1	18	1000	94%	0.2
36	Male	2015/16	LUKAS MGAYA	0.62	pine	0	0	17	1	18	1000	94%	0.25
37	Male	2015/16	ADRIAN KAYOMBO	0.62	pine	0	3	16	1	17	944	94%	0.25
38	Male	2015/16	STANLEY MWEVE	1.80	pine	0	0	16	1	17	944	94%	0.35
39		2015/16	VULNERABLE GROUP	20.39	pine	0	0	16	1	17	944	94%	0.4
40		2015/16	LUSITU PRIMARY SCHOOL	2.37	pine	0	0	15	1	16	889	94%	0.45
41	Female	2015/16	FLAVIANA MTEGA	0.74	pine	0	3	14	1	15	833	93%	0.3
42	Male	2015/16	IMMANUEL MBILINYI	1.56	pine	0	3	12	1	13	722	92%	0.2
43	Female	2015/16	NURU KAYOMBO	1.36	pine	0	0	23	2	25	1389	92%	0.3
44	Male	2015/16	THEOFRID	0.42	pine	0	0	23	2	25	1389	92%	0.2
45		2015/16	LUTHERAN CHURCH	1.56	pine	0	0	22	2	24	1333	92%	0.45
46	Male	2015/16	GREGORY MGAYA	0.67	pine	0	3	21	2	23	1278	91%	0.3
47	Male	2015/16	VERYMUND MWALONGO	2.15	pine	0	0	20	2	22	1222	91%	0.45
48	Male	2015/16	ELEUTHERIUS DAMBAGILLA	7.19	pine	0	0	20	2	22	1222	91%	0.3
49	Male	2015/16	SIXBERT MGAYA	0.54	pine	0	0	20	2	22	1222	91%	0.25
50	Male	2015/16	KILIAN MGAYA	0.91	pine	0	0	29	3	32	1777	91%	0.15
51	Male	2015/16	JONAS MWAGENI	0.79	pine	0	0	19	2	21	1166	90%	0.35

sRanks	Gender	Pyear	Name	Area (acres)	Specie	WC	WS	Live	Dead	Total	Stock (stem/ha)	S-%	Hdom (metre)
52	Male	2015/16	FROWN MGAYA	0.67	pine	0	0	19	2	21	1166	90%	0.15
53	Male	2015/16	MAFREM MTWEVE	1.38	pine	0	0	19	2	21	1166	90%	0.45
54	Female	2015/16	AJESTA SANGA	1.06	pine	0	0	18	2	20	1111	90%	0.25
55	Male	2015/16	JOHN MTWEVE	0.62	pine	0	0	18	2	20	1111	90%	0.35
56	Male	2015/16	PHILIP MGAYA	5.56	pine	0	3	18	2	20	1111	90%	0.4
57	Male	2015/16	CLODWIG MWALONGO	0.62	pine	0	0	17	2	19	1055	89%	0.25
58	Male	2015/16	EVARISTO MGAYA	1.33	pine	0	0	17	2	19	1055	89%	0.35
59		2015/16	FIGANGA PRIMARY SCHOOL	24.74	pine	0	3	16	2	18	1000	89%	0.35
60	Female	2015/16	ENELITHA MTWEVE	0.69	pine	0	0	16	2	18	1000	89%	0.2
61	Male	2015/16	SAMWEL MSIGOMBA	9.41	pine	0	0	16	2	18	1000	89%	0.75
62	Male	2015/16	CHESCO MLELWA	0.62	pine	0	3	16	2	18	1000	89%	0.3
63	Female	2015/16	DIGNA MGAYA	0.67	pine	0	3	16	2	18	1000	89%	0.2
64	Female	2015/16	CONBELL TONYA	1.04	pine	1	3	16	2	18	1000	89%	0.25
65	Female	2015/16	BLANTINA MWALONGO	0.69	pine	0	3	15	2	17	944	88%	0.35
66	Male	2015/16	AGATHON MANGALACHUMA	4.10	pine	0	0	15	2	17	944	88%	0.5
67	Male	2015/16	GELORD KAYOMBO	0.62	pine	0	0	15	2	17	944	88%	0.35
68	Male	2015/16	BONIFACE MWALONGO	0.67	eucalyptus	0	0	22	3	25	1389	88%	0.25
69	Male	2015/16	EDWARD MLIGO	5.81	pine	0	0	14	2	16	889	88%	0.25
70	Male	2015/16	ANDREA MTULO	1.06	pine	0	0	13	2	15	833	87%	0.3
71	Male	2015/16	JEOFREY NZIKU	0.44	pine	0	3	13	2	15	833	87%	0.3
72	Male	2015/16	ANTON MGAYA	0.74	pine	0	0	13	2	15	833	87%	0.2
73		2015/16	ROMAN CATHOLIC	4.42	pine	0	0	19	3	22	1222	86%	0.6
74	Male	2015/16	DEUS MGAYA	0.72	pine	0	0	12	2	14	778	86%	0.4
75	Male	2015/16	SIMON MWALONGO	0.84	pine	0	3	12	2	14	778	86%	0.25
76	Female	2015/16	AULERIA MLELWA	0.57	pine	0	1	18	3	21	1166	86%	0.15
77	Male	2015/16	ALBERTO MGAYA	1.51	pine	0	0	17	3	20	1111	85%	0.15

sRanks	Gender	Pyear	Name	Area (acres)	Specie	WC	WS	Live	Dead	Total	Stock (stem/ha)	S-%	Hdom (metre)
78	Male	2015/16	OMICA MGAYA	0.84	pine	0	0	17	3	20	1111	85%	0.35
79	Female	2015/16	OLIVIA MLELWA	0.89	pine	0	0	22	4	26	1444	85%	0.25
80	Female	2015/16	AGNES MGIMBA	0.74	pine	0	0	16	3	19	1055	84%	0.15
81	Female	2015/16	EMA MILINGA	0.72	pine	0	0	16	3	19	1055	84%	0.25
82	Male	2015/16	PATRICK MGAYA	19.03	eucalyptus	0	0	16	3	19	1055	84%	0.45
83	Male	2015/16	LUKAS NJELU	5.96	pine	0	3	15	3	18	1000	83%	0.35
84	Male	2015/16	TRYPHON MGAYA	0.64	pine	0	0	14	3	17	944	82%	0.15
85	Male	2015/16	GERVAS MGAYA	1.46	pine	0	3	14	3	17	944	82%	0.2
86	Male	2015/16	RASHID MGAYA	2.45	pine	0	0	14	3	17	944	82%	0.15
87	Male	2015/16	KANISIUS MAGAYA	0.49	pine	0	0	18	4	22	1222	82%	0.25
88	Male	2015/16	LEO MTWEVE	0.69	pine	0	0	13	3	16	889	81%	0.25
89	Male	2015/16	ALBERTO MGAYA	1.75	pine	0	0	13	3	16	889	81%	0.25
90	Male	2015/16	JOSEPH MSIGWA	0.59	pine	0	0	21	5	26	1444	81%	0.2
91	Female	2015/16	REGINA MGAYA	0.67	pine	0	0	16	4	20	1111	80%	0.15
92	Male	2015/16	OLITHO MGAYA	0.47	pine	0	0	16	4	20	1111	80%	0.45
93	Male	2015/16	CHRISTOPHER MLELWA	54.68	pine	0	0	16	4	20	1111	80%	0.35
94	Female	2015/16	PILI MLELWA	4.32	eucalyptus	0	0	16	4	20	1111	80%	0.2
95	Male	2015/16	ERASTO MGAYA	0.69	pine	0	0	16	4	20	1111	80%	0.2
96	Female	2015/16	ELINA MLELWA	0.67	pine	0	0	15	4	19	1055	79%	0.4
97	Male	2015/16	DEOGRASIAS MGAYA	0.64	pine	0	3	15	4	19	1055	79%	0.35
98	Male	2015/16	REMY KAYOMBO	0.77	pine	0	3	15	4	19	1055	79%	0.25
99		2015/16	FIGANGA PRIMARY SCHOL	8.25	pine	0	3	15	4	19	1055	79%	0.35
100	Female	2015/16	ERIKA MGAYA	0.59	pine	0	0	15	4	19	1055	79%	0.35
101	Male	2015/16	PATRICK MGAYA	1.71	eucalyptus	0	0	15	4	19	1055	79%	0.25
102	Male	2015/16	EGRAM MLOWE	0.62	pine	0	0	18	5	23	1278	78%	0.2
103	Male	2015/16	PATRICK MGAYA	0.00	eucalyptus	0	0	14	4	18	1000	78%	0.2

sRanks	Gender	Pyear	Name	Area (acres)	Specie	WC	WS	Live	Dead	Total	Stock (stem/ha)	S-%	Hdom (metre)
104	Male	2015/16	DISMAS MTEGA	0.69	eucalyptus	0	0	14	4	18	1000	78%	0.1
105	Male	2015/16	EDWARD MLIGO	4.40	pine	0	0	16	5	21	1166	76%	0.2
106	Female	2015/16	CONSOLATA MGIMBA	0.72	pine	0	3	16	5	21	1166	76%	0.2
107	Female	2015/16	HAPPY MSIGWA	0.64	pine	0	0	16	5	21	1166	76%	0.1
108	Male	2015/16	TEOFIL MGAYA	0.62	pine	0	0	15	5	20	1111	75%	0.3
109	Male	2015/16	EXAVERIUS MGAYA	0.52	pine	0	0	15	5	20	1111	75%	0.25
110	Male	2015/16	ATHA MWALONGO	0.86	pine	0	3	12	4	16	889	75%	0.25
111	Female	2015/16	SADINA MGAYA	0.57	pine	0	0	12	4	16	889	75%	0.25
112	Male	2015/16	PHILIP MGAYA	3.34	pine	0	3	15	5	20	1111	75%	0.4
113	Male	2015/16	SALVIUS NGILANGWA	1.01	eucalyptus	0	0	17	6	23	1278	74%	0.15
114	Male	2015/16	PATRICK MBATA	8.67	pine	0	0	14	5	19	1055	74%	0.3
115	Male	2015/16	KENNETH MGAYA	0.91	pine	0	0	14	5	19	1055	74%	0.2
116		2015/16	MLINGANO NURSERY SCHOOL	42.01	pine	0	0	14	5	19	1055	74%	0.15
117	Male	2015/16	WOLFRAM MTEGA	0.64	pine	0	0	14	5	19	1055	74%	0.2
118	Male	2015/16	PATRICK MGAYA	0.64	pine	0	3	13	5	18	1000	72%	0.2
119	Male	2015/16	ELEUTHERIUS DAMBAGILLA	0.62	pine	0	0	13	5	18	1000	72%	0.25
120	Male	2015/16	JOHN KAYOMBO	0.44	pine	0	0	10	4	14	778	71%	0.2
121	Male	2015/16	ALBERTO MGAYA	2.57	pine	0	0	15	6	21	1166	71%	0.15
122	Male	2015/16	KENNETH MGAYA	1.56	pine	0	0	12	5	17	944	71%	0.25
123	Male	2015/16	GEAZ SANGA	1.53	pine	0	3	12	5	17	944	71%	0.25
124	Female	2015/16	BADWN TONYA	0.64	pine	0	0	14	6	20	1111	70%	0.15
125	Female	2015/16	SABINA MTWEVE	0.79	pine	0	3	14	6	20	1111	70%	0.2
126	Male	2015/16	ANTON MGAYA	0.64	pine	0	0	14	6	20	1111	70%	0.2
127	Male	2015/16	EZEKIEL MGAYA	0.54	pine	0	0	13	6	19	1055	68%	0.3
128	Male	2015/16	TASILO MLELWA	1.04	pine	0	0	15	7	22	1222	68%	0.25
129	Female	2015/16	SHUKRANI KAMAGE	1.14	pine	0	0	12	7	19	1055	63%	0.15

sRanks	Gender	Pyear	Name	Area (acres)	Specie	WC	WS	Live	Dead	Total	Stock (stem/ha)	S-%	Hdom (metre)
130	Male	2015/16	KENNETH MGAYA	2.50	pine	0	0	17	10	27	1500	63%	0.4
131	Male	2015/16	EXAVERIUS MGAYA	0.49	pine	0	0	13	8	21	1166	62%	0.35
132	Male	2015/16	DEGRASIAS NYONGEZA	2.55	pine	0	0	13	8	21	1166	62%	0.15
133	Female	2015/16	VICTORIA MILINGA	0.49	pine	0	3	9	6	15	833	60%	0.2
134	Male	2015/16	PATRICK MGAYA	3.19	pine	0	0	10	7	17	944	59%	0.25
135	Female	2015/16	PILI MLELWA	0.67	pine	0	0	13	10	23	1278	57%	0.15
136	Male	2015/16	ERASTO MTITU	0.62	pine	0	0	11	9	20	1111	55%	0.25
137	Male	2015/16	EBEATH MGAYA	0.57	pine	0	0	12	10	22	1222	55%	0.45
138	Male	2015/16	PELEGRIN MGAYA	1.11	pine	0	3	12	10	22	1222	55%	0.25
139	Male	2015/16	ALDO MGAYA	0.54	pine	0	0	14	12	26	1444	54%	0.1
140	Male	2015/16	ADAM MTEGA	0.57	pine	0	0	9	9	18	1000	50%	0.2
141	Male	2015/16	DAMAS MGAYA	0.64	pine	0	0	11	13	24	1333	46%	0.1
142	Female	2015/16	EDA SANGA	0.40	pine	0	0	10	12	22	1222	45%	0.1
143	Male	2015/16	ANDREA MWAFUTE	0.00	pine	0	0	8	11	19	1055	42%	0.2
144	Male	2015/16	JOSEPHAT MLELWA	0.69	pine	0	0	6	10	16	889	38%	0.3
145	Male	2015/16	KELVIN MGAYA	0.62	pine	0	0	8	15	23	1278	35%	0.1
146	Male	2015/16	PATRICK MBATA	4.97	pine	0	0	5	11	16	889	31%	0.3

Key:	sRank	=	Rank based on survival score		Pyear	=	Planting year
	Name	=	Woodlot owner first and last name		Area	=	Area of the woodlot in hectare
	Specie	=	tree type (name)		WC	=	Circle weeding
	WS	=	Slash weeding		Live	=	Alive seedling
	Dead	=	Dead seedling		Total	=	Sum of seedling both dead and alive
	Stock	=	Total number of seedling per hectare		s-%	=	Survival percentage
	Sdeath	=	Score for dead seedling		hdom	=	Average height of two dominant (tallest) tree

Form Number:

Annex 1

1. WOODLOT ASSESSMENT FIELD SURVEY FORM

Surveyors: _____ Date: _____

WOODLOT LOCATION & OWNERSHIP

2. Coordinates by GPS

3. GPS accuracy

4. Village: _____ District: _____

5. Woodlot owner Name, Phone number and ID number (if applicable):

6. Has the woodlot changed owner since establishment? No / Yes / Unknown

If Yes, fill in the original owner: _____

PLOT MEASUREMENTS

7. Number of trees alive in the plot

8. Number of trees dead in the plot

9. Total number of trees in the plot

10. Height of the plot tallest tree (in decimetres): _____ dm, Second tallest tree: _____ dm

11. In case there are dead trees, assess the likely main cause of death:

Suppression by weeds

Cattle trampling:

Fire damage

Drought stress:

Disease

Other:

Insect damage

(specify "Other" in remarks)

GENERAL WOODLOT DATA

12. Species group: Pine / Eucalyptus / Teak

Scale: 0 – No weeding done
1 – Some weeding done, but not acceptably

13. Level of circle weeding in the woodlot: _____

14. Level of slash weeding in the woodlot: _____

2 – Weeding activities done acceptably
3 – Weeding activities done completely

ADDITIONAL REMARKS BY SURVEYORS



End of Dry Season woodlot assessment 2016/17

End of Dry season survey feedback report for Magunguli village

June 2016, Iringa, Tanzania



United Republic of Tanzania
**MINISTRY OF NATURAL RESOURCES
AND TOURISM**
Forestry and Beekeeping Division



**EMBASSY OF FINLAND
DAR ES SALAAM**

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LIST OF ANNEXES

Annex 1: Woodlot assessment field survey form

ABBREVIATIONS

GPS	Global Positioning System
PFP	Private Forestry Programme
TGIS	Tree Growing Incentive Scheme

1. INTRODUCTION

1.1. Background

The Private Forestry Programme (PFP) is a Finnish funded development aid programme designed to run from 2014 to 2030. It increases wealth in the Southern Highlands by promoting commercial management of smallholder plantations and wood processing enterprises.

This field survey was carried out in 25 villages that have been supported in planting trees by PFP. The field work was done from December 2016 to February 2017. The purpose of the field work was to assess the performance and management of the woodlots. The results will be used by PFP to improve its support models in the future.

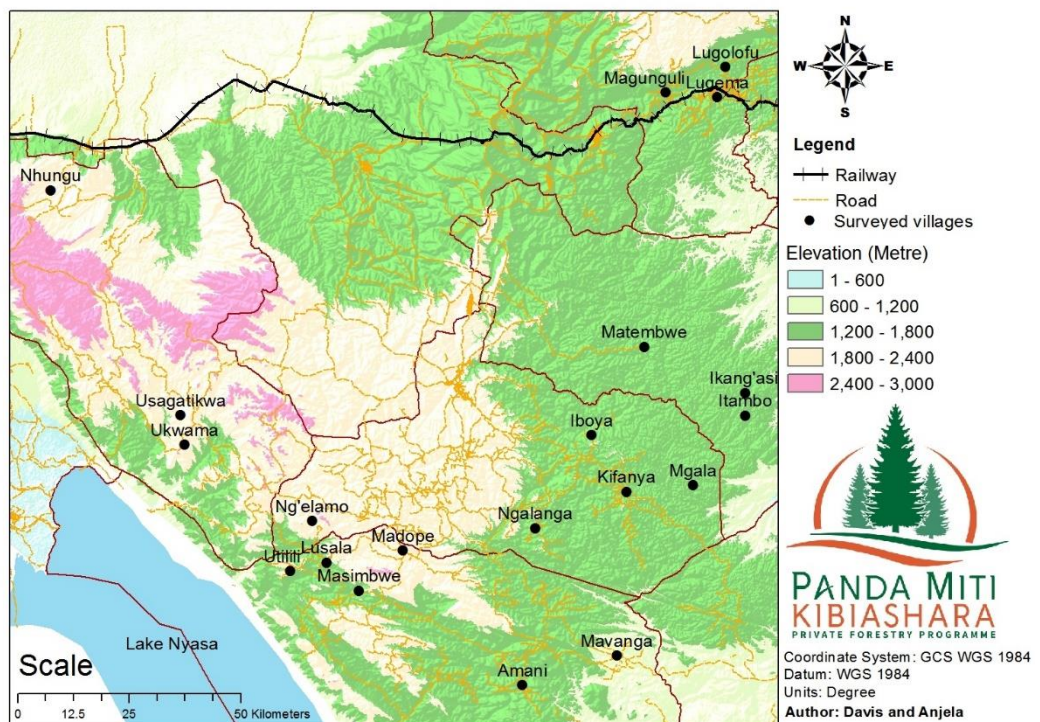
1.2. Objectives of the survey

- i. To assess the performance, survival, and level of management of the woodlots established through PFP support during the first two years of the programme.
- ii. To verify the status of the woodlots included in the PFP database.
- iii. To interview supported beneficiaries for collection of socioeconomic data.

2. LOCATION OF THE VILLAGE

Magunguli village is situated between latitude 8° 44' south and longitude 35° 10' east. The village is found in the eastern highland areas of Mufindi district in Iringa region (Figure. 1). The elevation ranges between 1100m to 1400m a.s.l.

Figure 19: A map showing the location of Magunguli village with respect to other surveyed villages



3. METHODOLOGY

3.1. Field procedures

The field teams conducted the following activities while surveying the woodlots:

- ✚ Navigating to the woodlots using GPS receiver and support from local TGA personnel
- ✚ Then, a rope of radius of 7.57m was used to define the boundary of a sample plot within the woodlot
- ✚ Within the sample plots, the number of live and dead seedlings were counted (Annex 1).
- ✚ Also the level of weeding was assessed as shown in Table 1
- ✚ Metal bar was inserted for the 2015/16 established woodlots, so that they can be found later with a metal detector if needed

Table 113 Classification for the level of weeding

Category/ Score	Title	Definition
0	No weeding done	There are practically no signs of weeding activities done during the past rainy season
1	Some weeding done, but not acceptably	There is clear evidence of weeding activities taken place during the past rainy season; however they have not been done sufficiently to ensure tree survival, good quality and good growth in the woodlot.
2	Weeding activities done acceptably	There are some shortcomings in the weeding activities, but the overall level is clearly sufficient to help ensure tree survival, good quality and good growth in the woodlot.
3	Weeding activities done completely	There are practically no signs of shortcomings, and all weeding activities appear to be conducted throughout the woodlot.

Key: The classification was reflected against the technical guidelines for circle and slash weeding as presented in the PFP TGIS guidelines. These require:

- Circle weeding: 50 cm radius to be cleared of weeds without damage to the tree in the middle.
- Slash weeding: all living weeds cut lower than 30 cm height.

It should be noted that no decisions of approval or disapproval for the level of weeding for support purposes were done in relation to this exercise.

3.2. Calculations and statistical analysis

- ✚ **Stand density (stems/ha):** the number of live trees plus number of dead trees in the sample plot, extended into a figure per hectare.
- ✚ **Survival percentage:** the share of live trees of the total number of trees in the sample plot.
- ✚ **Dominant height:** Average calculated from the two tallest tree heights measured in the sample plot. Assuming 3 x 3 m planting density, the figure represents the average height of the 100 tallest trees in a hectare.

3.3. Tools

- ✚ GPS receiver
- ✚ Smartphones installed with ODK collect tool
- ✚ PVC pipe and Rope of 7.57m radius
- ✚ Metal bar

4. RESULTS

4.1. Woodlots description

- ✚ A total of 48 woodlots owned by 32 beneficiaries surveyed (Table 2).
- ✚ The village surveyed woodlots comprised a total area of 200.95 acres supported by the programme through TGIS in kind (Table 2).

Table 114: Village total number and area of woodlots

Planting year/season	Beneficiaries	Number of woodlot	Total area (acres)
2015/16	Female	5	17.12
	Male	42	178.95
	Inst. & V.group	1	4.87
Grand Total		48	200.95

Key: Inst. & V.group = Institutions and vulnerable groups

4.2. Weeding

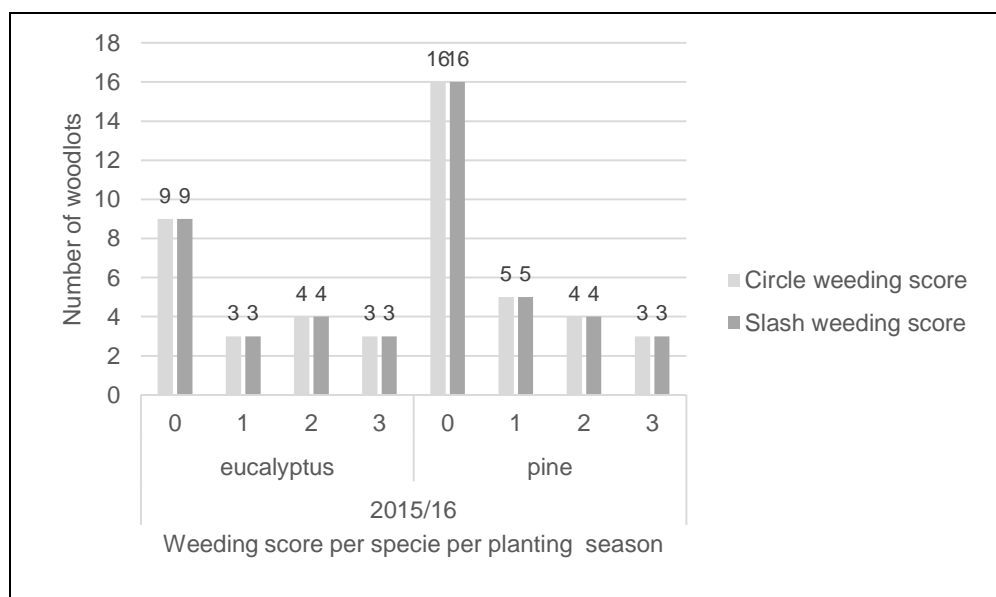
The observed score for both, circle and slash weeding were low (Table 3). The frequencies for assessed weeding scores are presented in Figure. 2.

Table 115 Mean circle weeding and slash weeding scores by species group and year of stand establishment

Planting year/season	Beneficiaries	Specie group	CW	SW
2015/16	Female	pine	1.50	0.00
		Eucalyptus	1.67	1.67
	Male	Pine	1.00	0.85
		Eucalyptus	0.87	0.87
	Inst. & V.group	Eucalyptus	2.00	2.00
Grand Total			1.04	0.88

Key: CW = Circular weeding SW = Slash weeding
Inst. & V.group = Institutions and vulnerable groups

Figure 20: Mean circle weeding and slash weeding scores by woodlots



4.3. Survival and stocking

4.3.1. Fire damage

Generally, at village level fire was not a major problem affecting survival of the tree seedling. Although at individual woodlot level, fire seems to be a major concern for future development of the woodlots. In Magunguli village two woodlots were affected by fire (Table 4), hence mitigate measure are vital for sustainability of the woodlots.

Table 116: Description of the woodlot damaged by fire

S/N	Remarks	Number
1	Number of woodlots	2
2	Area (acres)	8.05

4.3.2. Height growth

Magunguli village mean dominant height was good as observed in Table 5.

Table 117: Mean dominant height description

Species group	2015/16	
	hdom (metre)	
Eucalyptus		4.43
Pine		0.63
Grand total		2.17

Key: hdom = Dominant height

4.3.3. Survival and stocking

Table 6 below shows the general survival percentage and mean stocking of Magunguli village. In general, the village average survival percentage was low, as compared to other villages (Table 7).

Table 118: Mean survival percentage description

Species group	2015/16	
	S-%	Stocking (stem/ha)
Pines	77%	1246
Eucalyptus	91%	1149
Grand total	83%	1204

Table 119: The rank of villages by average survival percentage

Village name	Average survival percentage	Rank
Matembwe	99%	1
Usagatikwa	95%	2
Kidabaga	95%	3
Lusala	90%	4
Kiyowela	89%	5
Ukwama	84%	6
Ngalanga	83%	7
Magunguli	83%	8
Madope	83%	9
Ng'elamo	82%	10
Kifanya	82%	11
Mavanga	82%	12
Ikang'asi	81%	13
Iboya	79%	14
Itambo	77%	15
Mgala	76%	16
Utilili	72%	17
Kiwalamo	72%	18
Lugema	70%	19
Lugolofu	69%	20
Amani	68%	21
Makungu	61%	22
Ukwega	59%	23
Masimbwe	54%	24
Nhungu	48%	25

4.4. Weeding

4.4.1. Circular weeding

Table 8 below shows the general circular weeding score for Magunguli village. In general, the village average circular weeding score was low as compared to other villages (Table 9).

Table 120: Mean circular weeding score description

Specie group	WC
	2015/16
Pines	1.04
Eucalyptus	1.05
Grand total	1.04

Key: WC = Circular weeding scores,

Table 121: The rank of villages by average circular weeding score

Villages	Average circular weeding score	Rank
Usagatikwa	1.84	1
Matembwe	1.45	2
Lugema	1.39	3
Lugolofu	1.20	4
Kiyowela	1.10	5
Magunguli	1.04	6
Kiwalamo	0.96	7
Ukwega	0.83	8
Iboya	0.83	9
Mgala	0.82	10
Nhungu	0.76	11
Mavanga	0.76	12
Ukwama	0.63	13
Lusala	0.60	14
Makungu	0.52	15
Kifanya	0.44	16
Kidabaga	0.33	17
Itambo	0.32	18
Ikang'asi	0.27	19
Ng'elamo	0.21	20
Amani	0.15	21
Utilili	0.15	22
Ngalanga	0.06	23
Madope	0.01	24
Masimbwe	0.00	25

4.4.2. Slash weeding

Table 10 below shows the general slash weeding score for Magunguli village. In general, the village average slash weeding score was low as compared to other villages (Table 11).

Table 122: Mean slash weeding score description

Specie group	WC
	2015/16
Pines	0.79
Eucalyptus	1.05
Grand total	0.88

Key: WS = Slash weeding score

Table 123: The rank of villages by average slash weeding score

Villages	Average slash weeding score	Rank
Kidabaga	2.00	1
Matembwe	1.73	2
Kiyowela	1.15	3
Mavanga	1.14	4
Lugema	1.11	5
Lusala	0.93	6
Magunguli	0.88	7
Kiwalamo	0.85	8
Ukwega	0.83	9
Makungu	0.76	10
Madope	0.66	11
Mgala	0.58	12
Usagatikwa	0.47	13
Kifanya	0.35	14
Lugolofu	0.35	15
Ukwama	0.34	16
Utilili	0.33	17
Ikang'asi	0.31	18
Itambo	0.30	19
Nhungu	0.27	20
Amani	0.26	21
Iboya	0.22	22
Ngalanga	0.11	23
Masimbwe	0.03	24
Ng'elamo	0.00	25

5. CONCLUSION AND RECOMMENDATION

Generally, the villagers are encouraged to increase effort in the woodlots management activities especially weeding, in order to obtain better survival, growth and quality of trees.

Results from the survey observed a slight correlation between the weeding and survival percentage of the woodlots in Magunguli village. As described in Table 12, both, slash and circular weeding showed a strong negative and positive linear relationship to number of dead and live seedling respectively. This indicate that, woodlots with high weeding scores observed to have high number of live seedlings with less dead seedling.

Table 124: A correlation between weeding and survival score

Variable	Dead seedlings	Live seedlings
WC	-0.08	0.11
WS	-0.11	0.04

Key: WC = Circle weeding score WS = Slash weeding score

To some extent this information evaluate the need for weeding to increase survival percentage of the seedling in the woodlots. If both slash and circular weeding are done perfectly, then one could reduce the number of dead seedling and increase/maintain the number of live seedling in a particular woodlot. Scientifically weeding is proven to be vital for the survival of tree seedlings, since it reduces competition over nutrients, air and light between tree seedlings and weeds.

6. RESULTS FOR EACH INDIVIDUAL WOODLOT

Table 13 below shows the results for each individual beneficiary woodlots. It includes:

- ✚ Weeding score: both circular and slash weeding score
- ✚ Stem density (stem/ha)
- ✚ Survival percentage

Table 125: Village woodlots results

sRanks	Pyear	Name	Gender	Area (acres)	Specie	WC	WS	Live	Dead	Total	Stock (stem/ha)	S-%	Hdom (metre)
1	2015/16	BAHATI TWEVE	Male	3.98	eucalyptus	0	0	16	0	16	889	100%	4.35
2	2015/16	ESTO NDONDOLE	Male	6.50	eucalyptus	0	0	25	0	25	1389	100%	11.5
3	2015/16	MAPINDUZI NDONDOLE	Male	5.46	pine	0	1	17	0	17	944	100%	0.5
4	2015/16	BASIL MSAKWA	Male	1.41	pine	2	2	20	0	20	1111	100%	0.55
5	2015/16	GEORGE MNG'ONG'O	Male	1.01	pine	0	0	38	0	38	2111	100%	0.8
6	2015/16	ZAKARIA SUGAULI	Male	4.10	pine	3	3	24	0	24	1333	100%	1.05
7	2015/16	DONATUS KUTEMILE	Male	0.64	pine	0	1	26	0	26	1444	100%	0.85
8	2015/16	DONATUS KUTEMILE	Male	6.08	eucalyptus	3	3	20	0	20	1111	100%	9
9	2015/16	YUSTIN TWEVE	Male	3.98	eucalyptus	0	0	17	0	17	944	100%	6
10	2015/16	YUSTIN TWEVE	Male	1.61	pine	3	0	19	0	19	1055	100%	0.45
11	2015/16	FOTI UTAVANGU	Male	2.99	pine	0	1	24	0	24	1333	100%	0.65
12	2015/16	MAGUNGULI PRIMARY SCHOOL		4.87	eucalyptus	2	2	18	0	18	1000	100%	2.5
13	2015/16	STEPHANO MPILUKA	Male	1.51	pine	1	0	20	1	21	1166	95%	0.65
14	2015/16	GEORGE MNG'ONG'O	Male	0.89	pine	0	0	19	1	20	1111	95%	0.85
15	2015/16	EZEKIA MFIKWA	Male	3.04	pine	0	0	19	1	20	1111	95%	0.75
16	2015/16	HAMPREY NGWALE	Male	0.72	pine	0	0	16	1	17	944	94%	0.55
17	2015/16	ALFRED SATELE	Male	3.09	eucalyptus	2	2	30	2	32	1777	94%	3.7
18	2015/16	YUSTIN TWEVE	Male	3.19	eucalyptus	0	0	14	1	15	833	93%	1.65
19	2015/16	GERVAS NDANZI	Male	0.84	eucalyptus	2	2	26	2	28	1555	93%	8.5
20	2015/16	CHESCO NGONZI	Male	5.16	pine	1	1	25	2	27	1500	93%	0.85
21	2015/16	DEO SUTTA	Male	5.91	eucalyptus	3	3	24	2	26	1444	92%	3.55
22	2015/16	ZAWADI FUNGO	Female	2.27	eucalyptus	1	1	20	2	22	1222	91%	1.25
23	2015/16	HAMPREY NGWALE	Male	5.61	eucalyptus	0	0	19	2	21	1166	90%	2.85
24	2015/16	ZAWADI FUNGO	Female	3.26	eucalyptus	3	3	18	2	20	1111	90%	6.5
25	2015/16	PRISCA TWEVE	Female	5.71	eucalyptus	1	1	18	2	20	1111	90%	3.45
26	2015/16	BAHATI SUTTA	Male	2.30	eucalyptus	2	2	16	2	18	1000	89%	1.95
27	2015/16	ZAKARIA SAGAULI	Male	1.98	eucalyptus	1	1	16	2	18	1000	89%	2.45

sRanks	Pyear	Name	Gender	Area (acres)	Specie	WC	WS	Live	Dead	Total	Stock (stem/ha)	S-%	Hdom (metre)
28	2015/16	ALMON MPILUKA	Male	1.58	pine	1	0	26	4	30	1666	87%	0.45
29	2015/16	ABSON MANGULA	Male	2.22	pine	3	3	18	3	21	1166	86%	0.65
30	2015/16	ZAWADI FUNGO	Female	1.83	pine	3	0	17	3	20	1111	85%	0.55
31	2015/16	ABSON MANGULA	Male	0.94	pine	0	2	17	3	20	1111	85%	0.55
32	2015/16	FOTI UTAVANGU	Male	4.20	eucalyptus	0	0	17	3	20	1111	85%	2.65
33	2015/16	DOMINICK MPILUKA	Male	24.22	pine	1	0	16	3	19	1055	84%	0.55
34	2015/16	OREST SUTTA	Male	1.06	eucalyptus	0	0	20	4	24	1333	83%	5.2
35	2015/16	DONATUS KUTEMILE	Male	5.61	pine	3	3	18	4	22	1222	82%	0.65
36	2015/16	JAMES NGONZI	Male	8.67	pine	0	0	16	4	20	1111	80%	0.45
37	2015/16	JACHINDA MG'ONG'O	Male	1.43	eucalyptus	0	0	16	4	20	1111	80%	4.25
38	2015/16	GRASIANO MPILUKA	Male	1.63	pine	2	0	19	5	24	1333	79%	0.7
39	2015/16	ELIA SUTTA	Male	17.54	eucalyptus	0	0	10	3	13	722	77%	2.95
40	2015/16	GRASIANO MPILUKA	Male	0.86	pine	1	0	17	6	23	1278	74%	0.65
41	2015/16	HAMPFREY NGWALE	Male	1.56	pine	0	0	17	6	23	1278	74%	0.45
42	2015/16	OREST SUTTA	Male	3.78	pine	1	0	15	6	21	1166	71%	0.7
43	2015/16	ESTO NDONDOLE	Male	2.25	pine	1	0	13	7	20	1111	65%	0.4
44	2015/16	ZAWADI FUNGO	Female	4.05	pine	0	0	12	10	22	1222	55%	0.55
45	2015/16	NAFTAL MSAKWA	Male	3.51	pine	3	2	7	15	22	1222	32%	0.85
46	2015/16	HAMPREY NGWALE	Male	3.04	pine	1	2	5	20	25	1389	20%	0.35
47	2015/16	EVANS KIDUKO	Male	21.25	pine	0	0	0	24	24	1333	0%	0.65
48	2015/16	RENATUS MHICHE	Male	1.61	pine	0	1	0	18	18	1000	0%	

Key:

sRank = Rank based on survival score
Name = Woodlot owner first and last name
Specie = tree type (name)
WS = Slash weeding
Dead = Dead seedling
Stock = Total number of seedling per hectare
Sdeath = Score for dead seedling

Pyear = Planting year
Area = Area of the woodlot in hectare
WC = Circle weeding
Live = Alive seedling
Total = Sum of seedling both dead and alive
s-% = Survival percentage
hdom = Average height of two dominant (tallest) tree

Form Number:

Annex 1

1. WOODLOT ASSESSMENT FIELD SURVEY FORM

Surveyors: _____ Date: _____

WOODLOT LOCATION & OWNERSHIP

2. Coordinates by GPS

3. GPS accuracy

4. Village: _____ District: _____

5. Woodlot owner Name, Phone number and ID number (if applicable):

6. Has the woodlot changed owner since establishment? No / Yes / Unknown

If Yes, fill in the original owner: _____

PLOT MEASUREMENTS

7. Number of trees alive in the plot

8. Number of trees dead in the plot

9. Total number of trees in the plot

10. Height of the plot tallest tree (in decimetres): _____ dm, Second tallest tree: _____ dm

11. In case there are dead trees, assess the likely main cause of death:

Suppression by weeds

Cattle trampling:

Fire damage

Drought stress:

Disease

Other:

Insect damage

(specify "Other" in remarks)

GENERAL WOODLOT DATA

12. Species group: Pine / Eucalyptus / Teak

Scale: 0 – No weeding done
1 – Some weeding done, but not acceptably

13. Level of circle weeding in the woodlot: _____

14. Level of slash weeding in the woodlot: _____

2 – Weeding activities done acceptably
3 – Weeding activities done completely

ADDITIONAL REMARKS BY SURVEYORS



End of Dry Season woodlot assessment 2016/17

End of Dry season survey feedback report for Masimbwe village

June 2016, Iringa, Tanzania



United Republic of Tanzania
**MINISTRY OF NATURAL RESOURCES
AND TOURISM**
Forestry and Beekeeping Division



**EMBASSY OF FINLAND
DAR ES SALAAM**

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LIST OF ANNEXES

Annex 1: Woodlot assessment field survey form

ABBREVIATIONS

GPS Global Positioning System
PFP Private Forestry Programme
TGIS Tree Growing Incentive Scheme

1. INTRODUCTION

1.1. Background

The Private Forestry Programme (PFP) is a Finnish funded development aid programme designed to run from 2014 to 2030. It increases wealth in the Southern Highlands by promoting commercial management of smallholder plantations and wood processing enterprises.

This field survey was carried out in 25 villages that have been supported in planting trees by PFP. The field work was done from December 2016 to February 2017. The purpose of the field work was to assess the performance and management of the woodlots. The results will be used by PFP to improve its support models in the future.

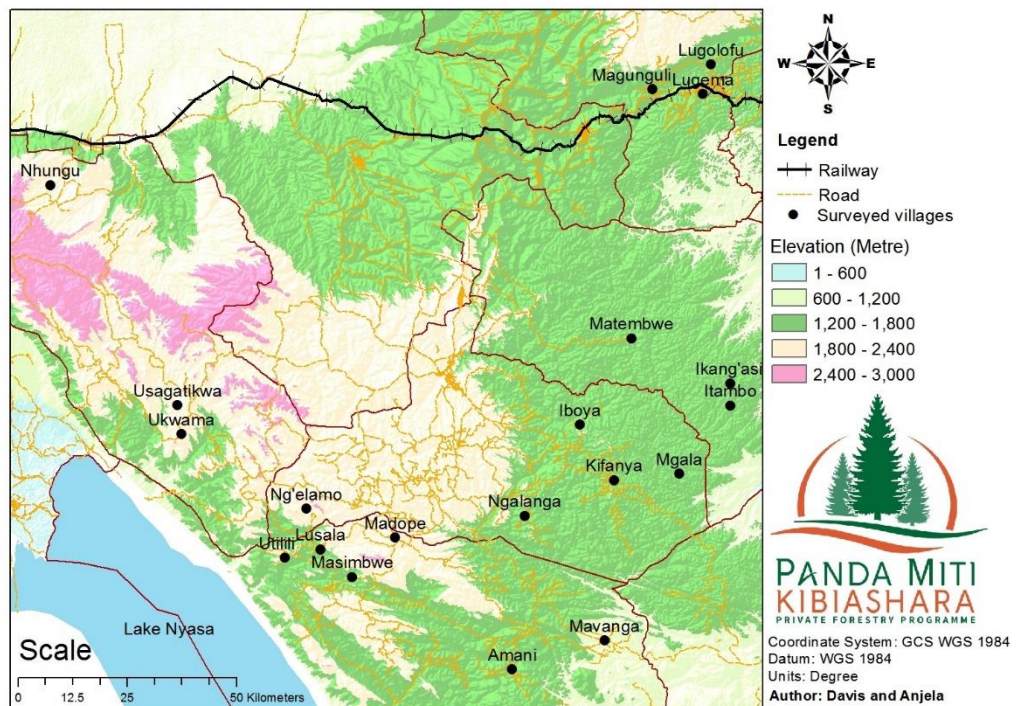
1.2. Objectives of the survey

- i. To assess the performance, survival, and level of management of the woodlots established through PFP support during the first two years of the programme.
- ii. To verify the status of the woodlots included in the PFP database.
- iii. To interview supported beneficiaries for collection of socioeconomic data.

2. LOCATION OF THE VILLAGE

Masimbwe village is situated between latitude 9° 44' south and longitude 34° 34' east. The village is found in the south eastern highland areas of Ludewa district in Njombe region and it is characterised as wet intermediate agro ecological zone (Figure. 1). The elevation ranges between 1200m to 2200m a.s.l.

Figure 21: A map showing the location of Masimbwe village with respect to other surveyed villages



3. METHODOLOGY

3.1. Field procedures

The field teams conducted the following activities while surveying the woodlots:

- ✚ Navigating to the woodlots using GPS receiver and support from local TGA personnel
- ✚ Then, a rope of radius of 7.57m was used to define the boundary of a sample plot within the woodlot
- ✚ Within the sample plots, the number of live and dead seedlings were counted (Annex 1).
- ✚ Also the level of weeding was assessed as shown in Table 1
- ✚ Metal bar was inserted for the 2015/16 established woodlots, so that they can be found later with a metal detector if needed

Table 126 Classification for the level of weeding

Category/ Score	Title	Definition
0	No weeding done	There are practically no signs of weeding activities done during the past rainy season
1	Some weeding done, but not acceptably	There is clear evidence of weeding activities taken place during the past rainy season; however they have not been done sufficiently to ensure tree survival, good quality and good growth in the woodlot.
2	Weeding activities done acceptably	There are some shortcomings in the weeding activities, but the overall level is clearly sufficient to help ensure tree survival, good quality and good growth in the woodlot.
3	Weeding activities done completely	There are practically no signs of shortcomings, and all weeding activities appear to be conducted throughout the woodlot.

Key: The classification was reflected against the technical guidelines for circle and slash weeding as presented in the PFP TGIS guidelines. These require:

- Circle weeding: 50 cm radius to be cleared of weeds without damage to the tree in the middle.
- Slash weeding: all living weeds cut lower than 30 cm height.

It should be noted that no decisions of approval or disapproval for the level of weeding for support purposes were done in relation to this exercise.

3.2. Calculations and statistical analysis

- ✚ **Stand density (stems/ha):** the number of live trees plus number of dead trees in the sample plot, extended into a figure per hectare.
- ✚ **Survival percentage:** the share of live trees of the total number of trees in the sample plot.
- ✚ **Dominant height:** Average calculated from the two tallest tree heights measured in the sample plot. Assuming 3 x 3 m planting density, the figure represents the average height of the 100 tallest trees in a hectare.

3.3. Tools

- ✚ GPS receiver
- ✚ Smartphones installed with ODK collect tool
- ✚ PVC pipe and Rope of 7.57m radius
- ✚ Metal bar

4. RESULTS

4.1. Woodlots description

- A total of 36 woodlots owned by 29 beneficiaries surveyed (Table 2).
- The village surveyed woodlots comprised a total area of 141.57 acres supported by the programme through TGIS in kind (Table 2).

Table 127: Village total number and area of woodlots

Planting year/season	Beneficiaries	Number of woodlot	Total area (acres)
2015/16	Female		23.29
	Male		93.96
	Inst. & V.group		24.32
Grand Total		36	141.57

Key: Inst. & V.group = Institutions and vulnerable groups

4.2. Weeding

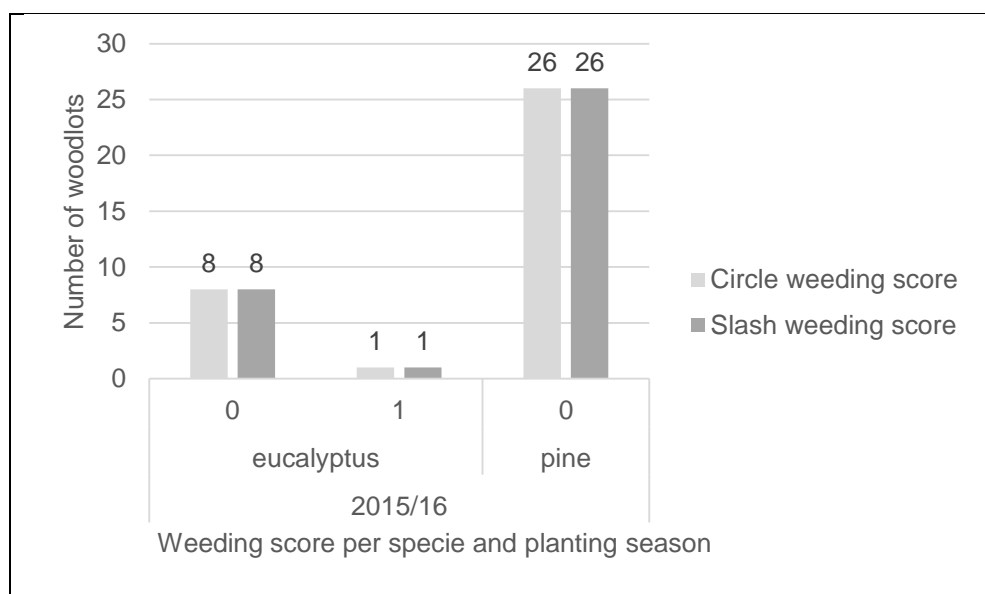
The observed score for both, circle and slash weeding were low (Table 3). The frequencies for assessed weeding scores are presented in Figure. 2.

Table 128 Mean circle weeding and slash weeding scores by species group and year of stand establishment

Planting year/season	Beneficiaries	Specie group	CW	SW
2015/16	Female	pine	0.00	0.00
		Eucalyptus	0.00	0.00
	Male	Pine	0.00	0.00
		Eucalyptus	0.00	0.20
	Inst. & V.group	Pine	0.00	0.00
		Eucalyptus	0.00	0.00
Grand Total			0.00	0.03

Key: CW = Circular weeding SW = Slash weeding
Inst. & V.group = Institutions and vulnerable groups

Figure 22: Mean circle weeding and slash weeding scores by woodlots



4.3. Survival and stocking

4.3.1. Fire damage

Generally, at village level fire was not a major problem affecting survival of the tree seedling. Although, fire seems to be a major concern for the future development of the woodlots, hence mitigate measure are vital for sustainability of the woodlots.

4.3.2. Height growth

Masimbwe village mean dominant height was good as observed in Table 4.

Table 129: Mean dominant height description

Species group	2015/16	
	hdom (metre)	
Eucalyptus		0.11
Pine		0.24
Grand total		0.21

Key: hdom = Dominant height

4.3.3. Survival and stocking

Table 5 below shows the general survival percentage and mean stocking of Masimbwe village. In general, the village average survival percentage was low, as compared to other villages (Table 6).

Table 130: Mean survival percentage description

Species group	2015/16	
	S-%	Stocking (stem/ha)
Pines	54%	1113
Eucalyptus	54%	1074
Grand total	54%	1103

Table 131: The rank of villages by average survival percentage

Village name	Average survival percentage	Rank
Matembwe	99%	1
Usagatikwa	95%	2
Kidabaga	95%	3
Lusala	90%	4
Kiyowela	89%	5
Ukwama	84%	6
Ngalanga	83%	7
Maguguli	83%	8
Madope	83%	9
Ng'elamo	82%	10
Kifanya	82%	11
Mavanga	82%	12
Ikang'asi	81%	13
Iboya	79%	14
Itambo	77%	15
Mgala	76%	16
Utilili	72%	17
Kiwalamo	72%	18
Lugema	70%	19
Lugolofu	69%	20
Amani	68%	21
Makungu	61%	22
Ukwega	59%	23
Masimbwe	54%	24
Nhungu	48%	25

4.4. Weeding

4.4.1. Circular weeding

Table 7 below shows the general circular weeding score for Masimbwe village. In general, the village average circular weeding score was low as compared to other villages (Table 8).

Table 132: Mean circular weeding score description

Specie group	WC
	2015/16
Pines	0.00
Eucalyptus	0.00
Grand total	0.00

Key: WC = Circular weeding scores,

Table 133: The rank of villages by average circular weeding score

Villages	Average circular weeding score	Rank
Usagatikwa	1.84	1
Matembwe	1.45	2
Lugema	1.39	3
Lugolofu	1.20	4
Kiyowela	1.10	5
Maguguli	1.04	6
Kiwalamo	0.96	7
Ukwega	0.83	8
Iboya	0.83	9
Mgala	0.82	10
Nhungu	0.76	11
Mavanga	0.76	12
Ukwama	0.63	13
Lusala	0.60	14
Makungu	0.52	15
Kifanya	0.44	16
Kidabaga	0.33	17
Itambo	0.32	18
Ikang'asi	0.27	19
Ng'elamo	0.21	20
Amani	0.15	21
Utilili	0.15	22
Ngalanga	0.06	23
Madope	0.01	24
Masimbwe	0.00	25

4.4.2. Slash weeding

Table 9 below shows the general slash weeding score for Masimbwe village. In general, the village average slash weeding score was low as compared to other villages (Table 10).

Table 134: Mean slash weeding score description

Specie group	WS
	2015/16
Pines	0.00
Eucalyptus	0.11
Grand total	0.03

Key: WS = Slash weeding score

Table 135: The rank of villages by average slash weeding score

Villages	Average slash weeding score	Rank
Kidabaga	2.00	1
Matembwe	1.73	2
Kiyowela	1.15	3
Mavanga	1.14	4
Lugema	1.11	5
Lusala	0.93	6
Maguguli	0.88	7
Kiwalamo	0.85	8
Ukwegga	0.83	9
Makungu	0.76	10
Madope	0.66	11
Mgala	0.58	12
Usagatikwa	0.47	13
Kifanya	0.35	14
Lugolofu	0.35	15
Ukwama	0.34	16
Utilili	0.33	17
Ikang'asi	0.31	18
Itambo	0.30	19
Nhungu	0.27	20
Amani	0.26	21
Iboya	0.22	22
Ngalanga	0.11	23
Masimbwe	0.03	24
Ng'elamo	0.00	25

5. CONCLUSION AND RECOMMENDATION

Generally, the villagers are encouraged to increase effort in the woodlots management activities especially weeding, in order to obtain better survival, growth and quality of trees.

In many of the village woodlots weeding was not done, but Results from other surveyed villages, observed a slight correlation between the weeding and survival percentage of the woodlots. As described in Table 11 (e.g. Magunguli village results), both, slash and circular weeding showed a strong negative and positive linear relationship to number of dead and live seedling respectively. This indicate that, woodlots with high weeding scores observed to have high number of live seedlings with less dead seedling.

Table 136: A correlation between weeding and survival score

Variable	Dead seedlings	Live seedlings
WC	-0.08	0.11
WS	-0.11	0.04

Key: WC = Circle weeding score WS = Slash weeding score

To some extent this information evaluate the need for weeding to increase survival percentage of the seedling in the woodlots. If both slash and circular weeding are done perfectly, then one could reduce the number of dead seedling and increase/maintain the number of live seedling in a particular woodlot. Scientifically weeding is proven to be vital for the survival of tree seedlings, since it reduces competition over nutrients, air and light between tree seedlings and weeds.

6. RESULTS FOR EACH INDIVIDUAL WOODLOT

Table 12 below shows the results for each individual beneficiary woodlots. It includes:

- ✚ Weeding score: both circular and slash weeding score
- ✚ Stem density (stem/ha)
- ✚ Survival percentage

Table 137: Village woodlots results

sRanks	Pyear	Name	Gender	Area (acres)	Specie	WC	WS	Live	Dead	Total	Stock (stem/ha)	S-%	Hdom (metre)
1	2015/16	KASIAN MGANWA	male	0.8	pine			22	0	22	1222	100%	0.3
2	2015/16	JACOBO MTWEVE	male	2.96	pine	0	0	25	2	27	1500	93%	0.55
3	2015/16	ANGLICAN CHURCH	male	0.41	pine	0	0	22	2	24	1333	92%	0.3
4	2015/16	AGUSTA HAULE	female	0	pine	0	0	16	2	18	1000	89%	0.35
5	2015/16	JOHNISIA MGANWA	female	2.08	pine	0	0	19	4	23	1278	83%	0.25
6	2015/16	JOFREY MBEMBATI	male	2.5	pine	0	0	19	5	24	1333	79%	0.15
7	2015/16	FRANK MTEGA	male	4.12	eucalyptus	0	0	12	4	16	889	75%	0.1
8	2015/16	TULAMWONA MTULO	female	0	eucalyptus	0	0	14	5	19	1055	74%	0.1
9	2015/16	KASIAN MGANWA	male	1.73	pine	0	0	15	6	21	1166	71%	0.2
10	2015/16	SABINA MTWEVE	female	2.98	eucalyptus	0	0	17	7	24	1333	71%	0.1
11	2015/16	KASIAN MGANWA	male	10.74	pine	0	0	16	7	23	1278	70%	0.35
12	2015/16	TULUWENI MTWEVE	male	1	pine	0	0	13	6	19	1055	68%	0.15
13	2015/16	VULNERABLE GROUP		0	eucalyptus	0	0	16	8	24	1333	67%	0.1
14	2015/16	LAMON MLELWA	male	1.31	pine	0	0	15	9	24	1333	63%	0.35
15	2015/16	SELENA MTEGA	female	2.71	pine	0	0	11	7	18	1000	61%	0.3
16	2015/16	EPIFANIA MWINUKA	female	2.67	pine	0	0	13	9	22	1222	59%	0.15
17	2015/16	EMANUEL MGAYA	male	9.78	eucalyptus	0	0	11	9	20	1111	55%	0.1
18	2015/16	NICLAS MGAYA	male	5.2	pine	0	0	11	11	22	1222	50%	0.2
19	2015/16	MENDRAD KAYOMBO	male	3.68	pine	0	0	10	10	20	1111	50%	0.15
20	2015/16	FEDRICK MGAYA	male	1.38	pine	0	0	12	13	25	1389	48%	0.2
21	2015/16	LAMON MLELWA	male	4.93	pine	0	0	10	11	21	1166	48%	0.15
22	2015/16	EVA MLELWA	female	2.12	pine	0	0	7	8	15	833	47%	0.1
23	2015/16	TAG MASIMBWE		24.32	pine	0	0	6	7	13	722	46%	0.35
24	2015/16	JOHN MGAYA	male	4.25	eucalyptus	0	0	10	13	23	1278	43%	0.2
25	2015/16	SIDE MBEGALO	male	1.36	pine	0	0	6	9	15	833	40%	0.2

sRanks	Pyear	Name	Gender	Area (acres)	Specie	WC	WS	Live	Dead	Total	Stock (stem/ha)	S-%	Hdom (metre)
26	2015/16	ELIET KAPINGA	female	4.95	pine	0	0	6	9	15	833	40%	0.3
27	2015/16	ELIA MLIGO	male	4.53	pine	0	0	8	12	20	1111	40%	0.2
28	2015/16	MELIANA MNYAMBWA	female	2.72	eucalyptus	0	0	6	9	15	833	40%	0.1
29	2015/16	SIDE MBEGALO	male	2.36	eucalyptus	0	0	7	13	20	1111	35%	0.1
30	2015/16	THOMAS MLELWA	male	6.45	pine	0	0	5	10	15	833	33%	0.3
31	2015/16	KASIAN MGANWA	male	0.51	eucalyptus	0	1	4	9	13	722	31%	0.1
32	2015/16	ERNEUS MTEGA	male	1.88	pine	0	0	4	12	16	889	25%	0.3
33	2015/16	TULAMWONA MTULO	female	0	pine	0	0	6	18	24	1333	25%	0.1
34	2015/16	REMIDIO MGAYA	male	14.17	pine	0	0	3	16	19	1055	16%	0.1
35	2015/16	FRANK MTEGA	male	7.91	pine	0	0	2	13	15	833	13%	0.15
36	2015/16	GRACE NGAIRO	female	3.06	pine	0	0	2	19	21	1166	10%	0.25

Key:

sRank = Rank based on survival score
Name = Woodlot owner first and last name
Specie = tree type (name)
WS = Slash weeding
Dead = Dead seedling
Stock = Total number of seedling per hectare
Sdeath = Score for dead seedling

Pyear = Planting year
Area = Area of the woodlot in hectare
WC = Circle weeding
Live = Alive seedling
Total = Sum of seedling both dead and alive
s-% = Survival percentage
hdom = Average height of two dominant (tallest) tree

Form Number:

Annex 1

1. WOODLOT ASSESSMENT FIELD SURVEY FORM

Surveyors: _____ Date: _____

WOODLOT LOCATION & OWNERSHIP

2. Coordinates by GPS

3. GPS accuracy

4. Village: _____ District: _____

5. Woodlot owner Name, Phone number and ID number (if applicable):

6. Has the woodlot changed owner since establishment? No / Yes / Unknown

If Yes, fill in the original owner: _____

PLOT MEASUREMENTS

7. Number of trees alive in the plot

8. Number of trees dead in the plot

9. Total number of trees in the plot

10. Height of the plot tallest tree (in decimetres): _____ dm, Second tallest tree: _____ dm

11. In case there are dead trees, assess the likely main cause of death:

Suppression by weeds

Cattle trampling:

Fire damage

Drought stress:

Disease

Other:

Insect damage

(specify "Other" in remarks)

GENERAL WOODLOT DATA

12. Species group: Pine / Eucalyptus / Teak

Scale: 0 – No weeding done
1 – Some weeding done, but not acceptably

13. Level of circle weeding in the woodlot: _____

14. Level of slash weeding in the woodlot: _____

2 – Weeding activities done acceptably
3 – Weeding activities done completely

ADDITIONAL REMARKS BY SURVEYORS



End of Dry Season woodlot assessment 2016/17

End of Dry season survey feedback report for Matembwe village

June 2016, Iringa, Tanzania



United Republic of Tanzania
**MINISTRY OF NATURAL RESOURCES
AND TOURISM**
Forestry and Beekeeping Division



**EMBASSY OF FINLAND
DAR ES SALAAM**

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LIST OF ANNEXES

Annex 1: Woodlot assessment field survey form

ABBREVIATIONS

GPS Global Positioning System
PFP Private Forestry Programme
TGIS Tree Growing Incentive Scheme

1. INTRODUCTION

1.1. Background

The Private Forestry Programme (PFP) is a Finnish funded development aid programme designed to run from 2014 to 2030. It increases wealth in the Southern Highlands by promoting commercial management of smallholder plantations and wood processing enterprises.

This field survey was carried out in 25 villages that have been supported in planting trees by PFP. The field work was done from December 2016 to February 2017. The purpose of the field work was to assess the performance and management of the woodlots. The results will be used by PFP to improve its support models in the future.

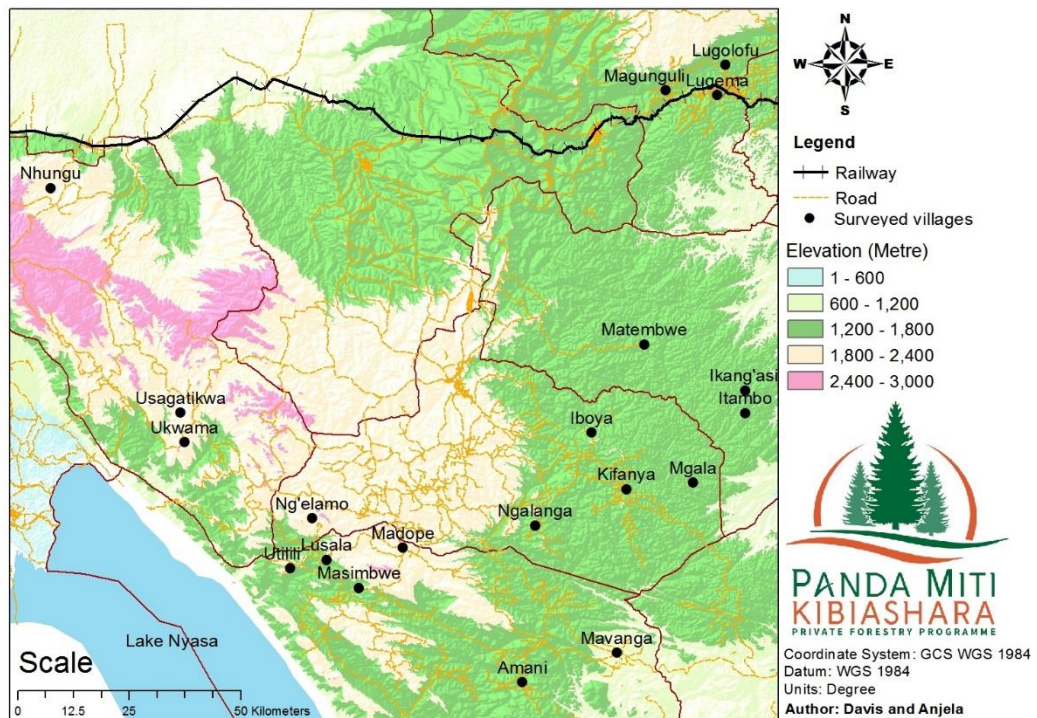
1.2. Objectives of the survey

- i. To assess the performance, survival, and level of management of the woodlots established through PFP support during the first two years of the programme.
- ii. To verify the status of the woodlots included in the PFP database.
- iii. To interview supported beneficiaries for collection of socioeconomic data.

2. LOCATION OF THE VILLAGE

Matembwe village is situated between latitude 9° 15' south and longitude 35° 08' east. The village is found in the south eastern highland areas of Njombe district council in Njombe region (Figure. 1). The elevation ranges between 1200m to 1800m a.s.l

Figure 23: A map showing the location of Matembwe village with respect to other surveyed villages



3. METHODOLOGY

3.1. Field procedures

The field teams conducted the following activities while surveying the woodlots:

- ✚ Navigating to the woodlots using GPS receiver and support from local TGA personnel
- ✚ Then, a rope of radius of 7.57m was used to define the boundary of a sample plot within the woodlot
- ✚ Within the sample plots, the number of live and dead seedlings were counted (Annex 1).
- ✚ Also the level of weeding was assessed as shown in Table 1
- ✚ Metal bar was inserted for the 2015/16 established woodlots, so that they can be found later with a metal detector if needed

Table 138 Classification for the level of weeding

Category/ Score	Title	Definition
0	No weeding done	There are practically no signs of weeding activities done during the past rainy season
1	Some weeding done, but not acceptably	There is clear evidence of weeding activities taken place during the past rainy season; however they have not been done sufficiently to ensure tree survival, good quality and good growth in the woodlot.
2	Weeding activities done acceptably	There are some shortcomings in the weeding activities, but the overall level is clearly sufficient to help ensure tree survival, good quality and good growth in the woodlot.
3	Weeding activities done completely	There are practically no signs of shortcomings, and all weeding activities appear to be conducted throughout the woodlot.

Key: The classification was reflected against the technical guidelines for circle and slash weeding as presented in the PFP TGIS guidelines. These require:

- Circle weeding: 50 cm radius to be cleared of weeds without damage to the tree in the middle.
- Slash weeding: all living weeds cut lower than 30 cm height.

It should be noted that no decisions of approval or disapproval for the level of weeding for support purposes were done in relation to this exercise.

3.2. Calculations and statistical analysis

- ✚ **Stand density (stems/ha):** the number of live trees plus number of dead trees in the sample plot, extended into a figure per hectare.
- ✚ **Survival percentage:** the share of live trees of the total number of trees in the sample plot.
- ✚ **Dominant height:** Average calculated from the two tallest tree heights measured in the sample plot. Assuming 3 x 3 m planting density, the figure represents the average height of the 100 tallest trees in a hectare.

3.3. Tools

- ✚ GPS receiver
- ✚ Smartphones installed with ODK collect tool
- ✚ PVC pipe and Rope of 7.57m radius
- ✚ Metal bar

4. RESULTS

4.1. Woodlots description

- ✚ A total of 11 woodlots owned by 11 beneficiaries surveyed (Table 2).
- ✚ The village surveyed woodlots comprised a total area of 14.90 acres supported by the programme through TGIS in kind (Table 2).

Table 139: Village total number and area of woodlots

Planting year/season	Beneficiaries	Number of woodlot	Total area (acres)
2014/15	Female	2	2.08
	Male	9	12.82
Grand Total		11	14.90

4.2. Weeding

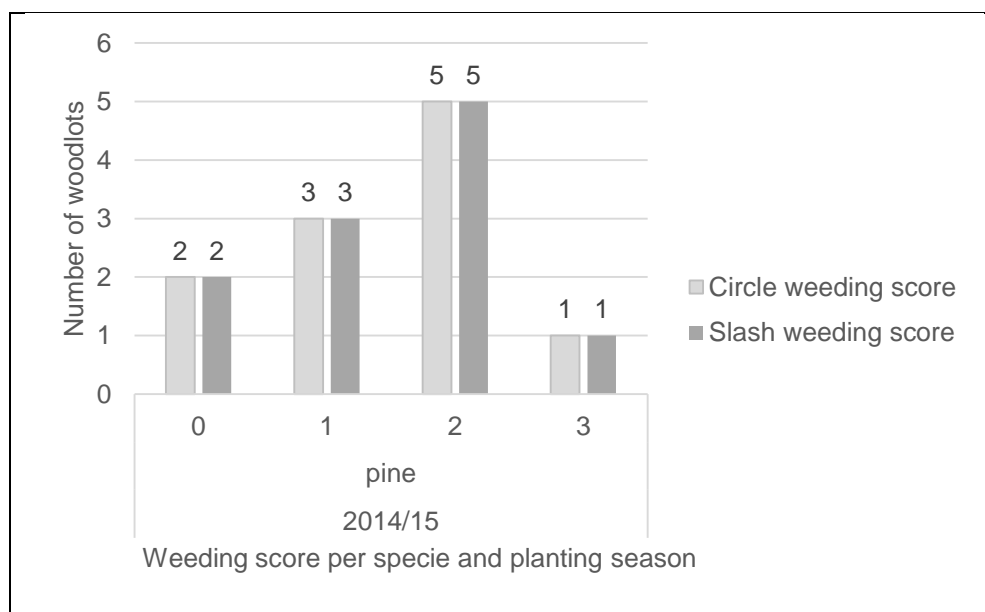
The observed score for both, circle and slash weeding were moderate (Table 3). The frequencies for assessed weeding scores are presented in Figure. 2.

Table 140 Mean circle weeding and slash weeding scores by species group and year of stand establishment

Planting year/season	Beneficiaries	Specie group	CW	SW
2014/15	Female	pine	2.00	2.00
	Male	Pine	1.33	1.67
Grand Total			1.45	1.73

Key: CW = Circular weeding SW = Slash weeding

Figure 24: Mean circle weeding and slash weeding scores by woodlots



4.3. Survival and stocking

4.3.1. Fire damage

Generally, at village level fire was not a major problem affecting survival of the tree seedling. Although, fire seems to be a major concern for the future development of the woodlots, hence mitigate measure are vital for sustainability of the woodlots.

4.3.2. Height growth

Matembwe village mean dominant height was good as observed in Table 4.

Table 141: Mean dominant height description

Species group	2014/15	
	hdom (metre)	
Pine		1.57
Grand total		1.57

Key: hdom = Dominant height

4.3.3. Survival and stocking

Table 5 below shows the general survival percentage and mean stocking of Matembwe village. In general, the village average survival percentage was high, as compared to other villages (Table 6).

Table 142: Mean survival percentage description

Species group	2014/15	
	S-%	Stocking (stem/ha)
Pines	99%	1096
Grand total	99%	1096

Table 143: The rank of villages by average survival percentage

Village name	Average survival percentage	Rank
Matembwe	99%	1
Usagatikwa	95%	2
Kidabaga	95%	3
Lusala	90%	4
Kiyowela	89%	5
Ukwama	84%	6
Ngalanga	83%	7
Maguguli	83%	8
Madope	83%	9
Ng'elamo	82%	10
Kifanya	82%	11
Mavanga	82%	12
Ikang'asi	81%	13
Iboya	79%	14
Itambo	77%	15
Mgala	76%	16
Utilili	72%	17
Kiwalamo	72%	18
Lugema	70%	19
Lugolofu	69%	20
Amani	68%	21
Makungu	61%	22
Ukwega	59%	23
Masimbwe	54%	24
Nhungu	48%	25

4.4. Weeding

4.4.1. Circular weeding

Table 7 below shows the general circular weeding score for Matembwe village. In general, the village average circular weeding score was high as compared to other villages (Table 8).

Table 144: Mean circular weeding score description

Specie group	WC
	2015/16
Pines	1.45
Grand total	1.45

Key: WC = Circular weeding scores,

Table 145: The rank of villages by average circular weeding score

Villages	Average circular weeding score	Rank
Usagatikwa	1.84	1
Matembwe	1.45	2
Lugema	1.39	3
Lugolofu	1.20	4
Kiyowela	1.10	5
Maguguli	1.04	6
Kiwalamo	0.96	7
Ukwega	0.83	8
Iboya	0.83	9
Mgala	0.82	10
Nhungu	0.76	11
Mavanga	0.76	12
Ukwama	0.63	13
Lusala	0.60	14
Makungu	0.52	15
Kifanya	0.44	16
Kidabaga	0.33	17
Itambo	0.32	18
Ikang'asi	0.27	19
Ng'elamo	0.21	20
Amani	0.15	21
Utilili	0.15	22
Ngalanga	0.06	23
Madope	0.01	24
Masimbwe	0.00	25

4.4.2. Slash weeding

Table 9 below shows the general slash weeding score for Matembwe village. In general, the village average slash weeding score was high as compared to other villages (Table 10).

Table 146: Mean slash weeding score description

Specie group	WS
	2015/16
Pines	1.73
Grand total	1.73

Key: WS = Slash weeding score

Table 147: The rank of villages by average slash weeding score

Villages	Average slash weeding score	Rank
Kidabaga	2.00	1
Matembwe	1.73	2
Kiyowela	1.15	3
Mavanga	1.14	4
Lugema	1.11	5
Lusala	0.93	6
Maguguli	0.88	7
Kiwalamo	0.85	8
Ukwega	0.83	9
Makungu	0.76	10
Madope	0.66	11
Mgala	0.58	12
Usagatikwa	0.47	13
Kifanya	0.35	14
Lugolofu	0.35	15
Ukwama	0.34	16
Utilili	0.33	17
Ikang'asi	0.31	18
Itambo	0.30	19
Nhungu	0.27	20
Amani	0.26	21
Iboya	0.22	22
Ngalanga	0.11	23
Masimbwe	0.03	24
Ng'elamo	0.00	25

5. CONCLUSION AND RECOMMENDATION

Generally, the villagers are encouraged to increase effort in the woodlots management activities especially weeding, in order to obtain better survival, growth and quality of trees.

Results from the survey observed a slight correlation between the weeding and survival percentage of the woodlots in Matembwe village. As described in Table 11, both, slash and circular weeding showed a strong negative and positive linear relationship to number of dead and live seedling respectively. This indicate that, woodlots with high weeding scores observed to have high number of live seedlings with less dead seedling.

Table 148: A correlation between weeding and survival score

Variable	Dead seedlings	Live seedlings
WC	-0.06	0.21
WS	-0.18	0.51

Key: WC = Circle weeding score WS = Slash weeding score

To some extent this information evaluate the need for weeding to increase survival percentage of the seedling in the woodlots. If both slash and circular weeding are done perfectly, then one could reduce the number of dead seedling and increase/maintain the number of live seedling in a particular woodlot. Scientifically weeding is proven to be vital for the survival of tree seedlings, since it reduces competition over nutrients, air and light between tree seedlings and weeds.

6. RESULTS FOR EACH INDIVIDUAL WOODLOT

Table 12 below shows the results for each individual beneficiary woodlots. It includes:

- ✚ Weeding score: both circular and slash weeding score
- ✚ Stem density (stem/ha)
- ✚ Survival percentage

Table 149: Village woodlots results

sRanks	Gender	Pyear	Name	Area (acres)	Specie	WC	WS	Live	Dead	Total	Stock (stem/ha)	S-%	Hdom (metre)
1	Male	2014/15	ALEX MABENA	1.09	pine	3	3	23	0	23	1278	100%	2
2	Male	2014/15	GEOFREY MABENA	1.90	pine	2	2	24	0	24	1333	100%	1.5
3	Male	2014/15	FRED MABENA	1.36	pine	0	0	18	0	18	1000	100%	1.35
4	Male	2014/15	SEBASTIAN MLUMBE	0.49	pine	2	3	20	0	20	1111	100%	2.15
5	Male	2014/15	JACKSON MBUNA	0.67	pine	2	2	18	0	18	1000	100%	1.15
6	Female	2014/15	DORAH LYANZILE	0.96	pine	2	2	17	0	17	944	100%	1.55
7	Male	2014/15	JIHANES KAMANGO	3.83	pine	1	2	17	0	17	944	100%	1.95
8	Male	2014/15	JIMMY KIHAKA	1.06	pine	0	2	24	0	24	1333	100%	1.85
9	Male	2014/15	ENNIO MALILE	0.82	pine	1	0	17	0	17	944	100%	1.25
10	Female	2014/15	LYDIA LUGENGE	1.11	pine	2	2	20	1	21	1166	95%	1.35
11	Male	2014/15	LAURENT MFUGALE	1.61	pine	1	1	16	2	18	1000	89%	1.15

Key:	sRank	=	Rank based on survival score	Pyear	=	Planting year
	Name	=	Woodlot owner first and last name	Area	=	Area of the woodlot in hectare
	Specie	=	tree type (name)	WC	=	Circle weeding
	WS	=	Slash weeding	Live	=	Alive seedling
	Dead	=	Dead seedling	Total	=	Sum of seedling both dead and alive
	Stock	=	Total number of seedling per hectare	s-%	=	Survival percentage
	Sdeath	=	Score for dead seedling	hdom	=	Average height of two dominant (tallest) tree

Annex 1

7. WOODLOT ASSESSMENT FIELD SURVEY FORM

Surveyors: _____ Date: _____

WOODLOT LOCATION & OWNERSHIP

8. Coordinates by GPS

9. GPS accuracy

10. Village: _____ District: _____

11. Woodlot owner Name, Phone number and ID number (if applicable):

12. Has the woodlot changed owner since establishment? No / Yes / Unknown

If Yes, fill in the original owner: _____

PLOT MEASUREMENTS

13. Number of trees alive in the plot

14. Number of trees dead in the plot

15. Total number of trees in the plot

16. Height of the plot tallest tree (in decimetres): _____ dm, Second tallest tree: _____ dm

17. In case there are dead trees, assess the likely main cause of death:

- | | |
|---|--|
| Suppression by weeds <input type="checkbox"/> | Cattle trampling: <input type="checkbox"/> |
| Fire damage <input type="checkbox"/> | Drought stress: <input type="checkbox"/> |
| Disease <input type="checkbox"/> | Other: <input type="checkbox"/> |
| Insect damage <input type="checkbox"/> | (specify "Other" in remarks) |

GENERAL WOODLOT DATA

18. Species group: Pine / Eucalyptus / Teak

19. Level of circle weeding in the woodlot: _____

20. Level of slash weeding in the woodlot: _____

Scale: 0 – No weeding done
1 – Some weeding done, but not acceptably
2 – Weeding activities done acceptably
3 – Weeding activities done completely

ADDITIONAL REMARKS BY SURVEYORS



End of Dry Season woodlot assessment 2016/17

End of Dry season survey feedback report for Mavanga village

June 2017, Iringa, Tanzania



United Republic of Tanzania
**MINISTRY OF NATURAL RESOURCES
AND TOURISM**
Forestry and Beekeeping Division



**EMBASSY OF FINLAND
DAR ES SALAAM**

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LIST OF ANNEXES

Annex 1: Woodlot assessment field survey form

ABBREVIATIONS

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1. INTRODUCTION

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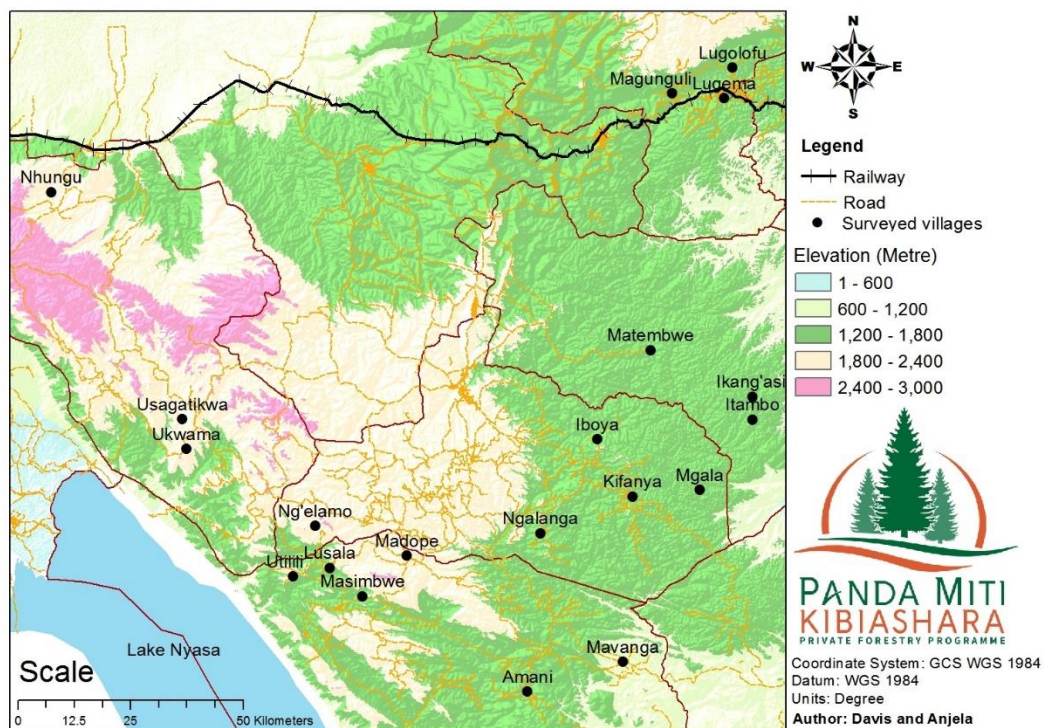
1.2. Objectives of the survey

- i. To assess the performance, survival, and level of management of the woodlots established through PFP support during the first two years of the programme.
- ii. To verify the status of the woodlots included in the PFP database.
- iii. To interview supported beneficiaries for collection of socioeconomic data.

2. LOCATION OF THE VILLAGE

Mavanga village is situated between latitude 9° 52' south and longitude 35° 05' east. The village is found in the south eastern highland areas of Ludewa district in Njombe region and it is characterised as wet intermediate agro ecological zone (Figure. 1). The elevation ranges between 700m to 2000m a.s.l. and the soil texture is clay silt and alluvial soils in the valley bottom areas.

Figure 25: A map showing the location of Mavanga village with respect to other surveyed villages



3. METHODOLOGY

3.1. Field procedures

The field teams conducted the following activities while surveying the woodlots:

- ✚ Navigating to the woodlots using GPS receiver and support from local TGA personnel
- ✚ Then, a rope of radius of 7.57m was used to define the boundary of a sample plot within the woodlot
- ✚ Within the sample plots, the number of live and dead seedlings were counted (Annex 1).
- ✚ Also the level of weeding was assessed as shown in Table 1
- ✚ Metal bar was inserted for the 2015/16 established woodlots, so that they can be found later with a metal detector if needed.

Table 150 Classification for the level of weeding

Category/ Score	Title	Definition
0	No weeding done	There are practically no signs of weeding activities done during the past rainy season
1	Some weeding done, but not acceptably	There is clear evidence of weeding activities taken place during the past rainy season; however they have not been done sufficiently to ensure tree survival, good quality and good growth in the woodlot.
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Key: The classification was reflected against the technical guidelines for circle and slash weeding as presented in the PFP TGIS guidelines. These require:

- Circle weeding: 50 cm radius to be cleared of weeds without damage to the tree in the middle.
- Slash weeding: all living weeds cut lower than 30 cm height.

It should be noted that no decisions of approval or disapproval for the level of weeding for support purposes were done in relation to this exercise.

3.2. Calculations and statistical analysis

- ✚ **Stand density (stems/ha):** the number of live trees plus number of dead trees in the sample plot, extended into a figure per hectare.
- ✚ **Survival percentage:** the share of live trees of the total number of trees in the sample plot.
- ✚ **Dominant height:** Average calculated from the two tallest tree heights measured in the sample plot. Assuming 3 x 3 m planting density, the figure represents the average height of the 100 tallest trees in a hectare.

3.3. Tools

- ✚ GPS receiver
- ✚ Smartphones installed with ODK collect tool
- ✚ PVC pipe and Rope of 7.57m radius
- ✚ Metal bar

4. RESULTS

4.1. Woodlots description

- A total of 169 woodlots owned by 101 beneficiaries surveyed (Table 2).
- The village surveyed woodlots comprised a total area of more than 169.31 acres supported by the programme through TGIS in kind (Table 2). Area for 20 woodlots was unknown.

Table 151: Village total number and area of woodlots

Planting year/season	Beneficiaries	Number of woodlot	Total area (acres)
2014/15	Female	32	30.10
	Male	59	56.71
2015/16	Female	32	41.37
	Male	46	41.14
Grand Total		169	169.32

Note: Area for 20 woodlots were unknown

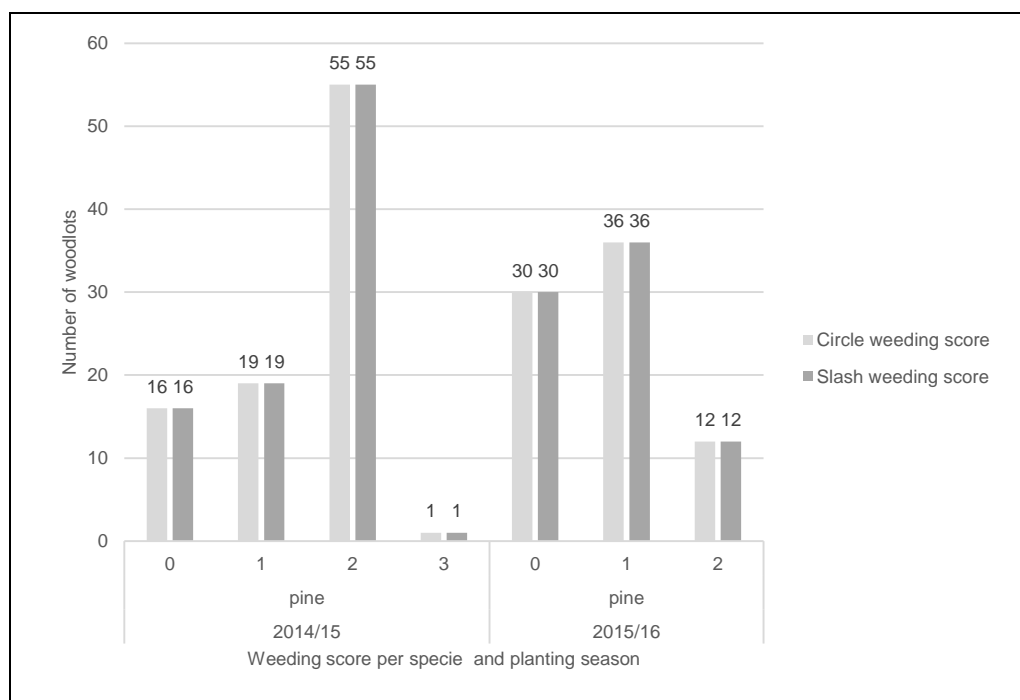
4.2. Weeding

The observed score for both, circle and slash weeding were generally low (Table 3). The frequencies for assessed weeding scores are presented in Figure. 2.

Table 152 Mean circle weeding and slash weeding scores by specie group and year of stand establishment

Beneficiary	Specie group	Circle weeding		Slash weeding	
		2014/15	2015/16	2014/15	2015/16
Female	Pine	1.03	0.50	1.59	0.69
Male	Pine	0.88	0.59	1.37	0.83
Grand total		0.93	0.55	1.45	0.77

Figure 26: Mean circle weeding and slash weeding scores by woodlots



4.3. Survival and stocking

4.3.1. Fire damage

Generally, at village level fire was not a major problem affecting survival of the tree seedling. Although at individual woodlot level, fire seems to be a major concern for future development of the woodlots hence mitigate measure are vital for sustainability of the woodlots.

4.3.2. Height growth

Mavanga village mean dominant height was good as observed in Table 4.

Table 153: Mean dominant height description

Specie group	hdom (metre)	
	2014/15	2015/16
Pines	1.67	4.21
Grand total	1.67	4.21

Key: hdom = Dominant height

4.3.3. Survival and stocking

Table 5 below shows the general survival percentage and mean stocking for Mavanga village. In general, the village average survival percentage was low as compared to other villages (Table 6).

Table 154: Mean survival percentage description

Specie group	2014/15		2015/16	
	S-%	Stock (stem/ha)	S-%	Stock (stem/ha)
Pines	91%	1006	72%	1055
Grand total	91%	1006	72%	1055

Key: S-% = Survival percentage

Table 155: The rank of villages by average survival percentage

Village name	Average survival percentage	Rank
Matembwe	99%	1
Usagatikwa	95%	2
Kidabaga	95%	3
Lusala	90%	4
Kiyowela	89%	5
Ukwama	84%	6
Ngalanga	83%	7
Maguguli	83%	8
Madope	83%	9
Ng'elamo	82%	10
Kifanya	82%	11
Mavanga	82%	12
Ikang'asi	81%	13
Iboya	79%	14
Itambo	77%	15
Mgala	76%	16
Utilili	72%	17
Kiwalamo	72%	18
Lugema	70%	19
Lugolofu	69%	20
Amani	68%	21
Makungu	61%	22
Ukwega	59%	23
Masimbwe	54%	24
Nhungu	48%	25

4.4. Weeding

4.4.1. Circular weeding

Table 7 below shows the general circular weeding score for Mavanga village. In general, the village average circular weeding score was low as compared to other villages (Table 8).

Table 156: Mean circular weeding score description

Specie group	Circle weeding score	
	2014/15	2015/16
Pines	0.93	0.55
Grand total	0.93	0.55

Table 157: The rank of villages by average circular weeding score

Villages	Average circular weeding score	Rank
Usagatikwa	1.84	1
Matembwe	1.45	2
Lugema	1.39	3
Lugolofu	1.20	4
Kiyowela	1.10	5
Maguguli	1.04	6
Kiwalamo	0.96	7
Ukwega	0.83	8
Iboya	0.83	9
Mgala	0.82	10
Nhungu	0.76	11
Mavanga	0.76	12
Ukwama	0.63	13
Lusala	0.60	14
Makungu	0.52	15
Kifanya	0.44	16
Kidabaga	0.33	17
Itambo	0.32	18
Ikang'asi	0.27	19
Ng'elamo	0.21	20
Amani	0.15	21
Utilili	0.15	22
Ngalanga	0.06	23
Madope	0.01	24
Masimbwe	0.00	25

4.4.2. Slash weeding

Table 9 below shows the general slash weeding score for Mavanga village. In general, the village average slash weeding score was low as compared to other villages (Table 10).

Table 158: Mean slash weeding score description

Specie group	Slash weeding score	
	2014/15	2015/16
Pines	1.45	0.77
Grand total	1.45	0.77

Table 159: The rank of villages by average slash weeding score

Villages	Average slash weeding score	Rank
Kidabaga	2.00	1
Matembwe	1.73	2
Kiyowela	1.15	3
Mavanga	1.14	4
Lugema	1.11	5
Lusala	0.93	6
Maguguli	0.88	7
Kiwalamo	0.85	8
Ukwega	0.83	9
Makungu	0.76	10
Madope	0.66	11
Mgala	0.58	12
Usagatikwa	0.47	13
Kifanya	0.35	14
Lugolofu	0.35	15
Ukwama	0.34	16
Utilili	0.33	17
Ikang'asi	0.31	18
Itambo	0.30	19
Nhungu	0.27	20
Amani	0.26	21
Iboya	0.22	22
Ngalanga	0.11	23
Masimbwe	0.03	24
Ng'elamo	0.00	25

5. CONCLUSION AND RECOMMENDATION

Generally, the villagers are encouraged to increase effort in the woodlots management activities especially weeding, in order to obtain better survival, growth and quality of trees.

Results from the survey observed a slight correlation between the weeding and survival percentage of the woodlots in Mavanga village. As described in Table 11, both, slash and circular weeding showed a negative and positive linear relationship to number of dead and live seedling respectively. This indicate that, woodlots with high weeding scores observed to have high number of live seedlings with less dead seedling.

Table 160: A correlation between weeding and survival score

Variable	Dead seedlings	Live seedlings
WC	-0.124	0.129
WS	-0.269	0.223

Key: WC = Circle weeding score WS = Slash weeding score

To some extent this information evaluate the need for weeding to increase survival percentage of the seedling in the woodlots. If both slash and circular weeding are done perfectly, then one could reduce the number of dead seedling and increase/maintain the number of live seedling in a particular woodlot. Scientifically weeding is proven to be vital for the survival of tree seedlings, since it reduces competition over nutrients, air and light between tree seedlings and weeds.

6. RESULTS FOR EACH INDIVIDUAL WOODLOT

Table 12 below shows the results for each individual beneficiary woodlots. It includes:

- ✚ Weeding score: both circular and slash weeding score
- ✚ Stem density (stem/ha)
- ✚ Survival percentage

Table 161: Village woodlots results

sRank	Pyear	Name	Gender	Area (acres)	Specie	WC	WS	Live	Dead	Total	Stock (stem/ha)	S-%	Hdom (metre)
1	2014/15	PRISKA MGINA	Female	1.16	pine	2	2	13	0	13	722	100%	2.4
2	2014/15	LAMON KOMBA	Male	1.16	pine	2	2	19	0	19	1055	100%	1.7
3	2014/15	IMELDA MHAGAMA	Female	1.09	pine	2	2	18	0	18	1000	100%	1.85
4	2014/15	MELANIA MBENA	Female	1.01	pine	2	2	18	0	18	1000	100%	1.65
5	2015/16	SUZANA KOMBA	Female	0.69	pine	2	1	22	0	22	1222	100%	0.45
6	2014/15	ANDREA MTEGA	Male	0.32	pine	1	2	23	0	23	1278	100%	1.85
7	2014/15	GODFREY MWAGENI	Male	0.84	pine	1	2	20	0	20	1111	100%	2.25
8	2014/15	BLASIUS MGINA	Male		pine	0	0	15	0	15	833	100%	1.65
9	2014/15	HERBERT LUOGA	Male	0.96	pine	2	2	19	0	19	1055	100%	2
10	2014/15	FAUSTIN MGAYA	Male	0.30	pine	0	0	18	0	18	1000	100%	2.15
11	2014/15	JULIUS MPWAGE	Male	1.33	pine	2	2	21	0	21	1166	100%	2
12	2015/16	RASHID MLELWA	Male	0.72	pine	1	1	18	0	18	1000	100%	0.3
13	2014/15	EDWINI MGAYA	Male	0.99	pine	2	2	28	0	28	1555	100%	1.9
14	2014/15	GETSEMAN MTEGA	Male	0.42	pine	1	2	12	0	12	667	100%	1.85
15	2014/15	ANGELA MLELWA	Female	0.74	pine	2	2	20	0	20	1111	100%	1.95
16	2014/15	CLEMENCE MGIMBA	Female	1.53	pine	0	1	18	0	18	1000	100%	1.15
17	2014/15	STEPHANO MTEGA	Male	1.21	pine	2	2	11	0	11	611	100%	2
18	2014/15	ABELI MTEGA	Male	1.26	pine	2	2	11	0	11	611	100%	2.15
19	2014/15	MELINA MLWILO	Female		pine	0	2	17	0	17	944	100%	1.35
20	2014/15	GERVAS MWAPINGA	Male	1.01	pine	0	2	18	0	18	1000	100%	1.7
21	2014/15	AULELIA MGIMBA	Male	2.77	pine	1	1	16	0	16	889	100%	2.7
22	2014/15	SOPHIA MLIGO	Female	0.67	pine	0	0	18	0	18	1000	100%	1.9
23	2015/16	KONDRADA MLELWA	Female	1.01	pine	0	0	3	0	3	167	100%	0.25
24	2015/16	ESTA NYIGU	Female	1.19	pine	0	0	18	0	18	1000	100%	0.25
25	2014/15	FRANK MGINA	Female	0.52	pine	1	2	20	0	20	1111	100%	1.75
26	2014/15	MATHIAS MGAYA	Male	1.53	pine	0	1	12	0	12	667	100%	1.15
27	2014/15	SELESTIN MGINA	Male	0.59	pine	1	2	18	0	18	1000	100%	2.2

sRank	Pyear	Name	Gender	Area (acres)	Specie	WC	WS	Live	Dead	Total	Stock (stem/ha)	S-%	Hdom (metre)
28	2014/15	FILLO MLELWA	Female	0.99	pine	1	2	19	0	19	1055	100%	1.65
29	2014/15	AMOS MWABENA	Male	0.67	pine	1	1	19	0	19	1055	100%	1.65
30	2014/15	ANDREA MGAYA	Male	1.11	pine	2	1	21	0	21	1166	100%	1.55
31	2014/15	PETRONIA SAMGENI	Female	0.59	pine	1	1	21	0	21	1166	100%	1.9
32	2014/15	EDGAR MKINGA	Male	1.19	pine	1	2	25	1	26	1444	96%	2
33	2015/16	STANLEY SAPULA	Male	1.41	pine	0	1	22	1	23	1278	96%	0.35
34	2014/15	BRIGITA MLELWA	Female	0.72	pine	1	1	20	1	21	1166	95%	2.1
35	2014/15	AIDANI MLOWE	Male	0.44	pine	1	1	20	1	21	1166	95%	2.15
36	2014/15	EDGAR MKINGA	Male	0.32	pine	1	1	20	1	21	1166	95%	0.4
37	2014/15	KONES MTEGA	Male	0.57	pine	1	2	19	1	20	1111	95%	2.45
38	2014/15	AULELIA MGIMBA	Female		pine	0	1	19	1	20	1111	95%	1.7
39	2015/16	BIBIANA MTWEVE	Female	1.28	pine	0	0	19	1	20	1111	95%	0.25
40	2014/15	NOELY MTONYA	Male	0.86	pine	2	2	18	1	19	1055	95%	2.3
41	2014/15	NEEMA MBWILO	Female	1.24	pine	2	2	18	1	19	1055	95%	2.7
42	2014/15	BERNARD MLIGO	Male	1.01	pine	2	2	18	1	19	1055	95%	2.1
43	2014/15	RICHARD MKORONGO	Male	0.40	pine	0	0	18	1	19	1055	95%	1.9
44	2014/15	ROZALIA NYANDOA	Female	0.84	pine	1	2	18	1	19	1055	95%	1.55
45	2014/15	KONDRADA MLELWA	Female	0.79	pine	0	2	18	1	19	1055	95%	1.8
46	2014/15	RAINALD SAPULA	Male	0.96	pine	0	2	17	1	18	1000	94%	1.75
47	2014/15	LEMIDIA MWALONGO	Male	1.04	pine	2	2	17	1	18	1000	94%	2.3
48	2014/15	SISILO KAYOMBO	Female	1.19	pine	0	2	17	1	18	1000	94%	1.45
49	2014/15	BIBIANA MTWEVE	Male	0.72	pine	0	2	17	1	18	1000	94%	1.65
50	2014/15	OSMUNDA MGINA	Male	1.19	pine	0	2	17	1	18	1000	94%	1.35
51	2014/15	SISILO KAYOMBO	Male		pine	1	2	16	1	17	944	94%	1.7
52	2014/15	PASINCE MKINGA	Male	0.52	pine	1	2	16	1	17	944	94%	0.5
53	2014/15	VALELIA HAULE	Female	1.31	pine	2	2	15	1	16	889	94%	1.8
54	2014/15	ETHERO NZIKU	Male	1.46	pine	2	2	21	2	23	1278	91%	1.9
55	2015/16	ALFONCE MWAGENI	Male	1.24	pine	0	0	19	2	21	1166	90%	0.45
56	2015/16	VITALIS MGIMBA	Male	0.79	pine	0	0	19	2	21	1166	90%	0.55

sRank	Pyear	Name	Gender	Area (acres)	Specie	WC	WS	Live	Dead	Total	Stock (stem/ha)	S-%	Hdom (metre)
57	2015/16	EPIFANIA MTWEVE	Female	1.06	pine	1	1	19	2	21	1166	90%	0.25
58	2014/15	IBRAHIM MLELWA	Male	0.86	pine	2	0	18	2	20	1111	90%	2.5
59	2014/15	YUDITH MLIGO	Female	1.28	pine	2	2	18	2	20	1111	90%	1.9
60	2015/16	EPIFANIA MTWEVE	Female	0.69	pine	0	2	18	2	20	1111	90%	2.1
61	2014/15	ESTA NYIGU	Female		pine	0	2	18	2	20	1111	90%	1.85
62	2014/15	ASIA NGONGI	Female		pine	0	1	18	2	20	1111	90%	2.65
63	2015/16	CLEMENCE MGIMBA	Male	1.16	pine	0	1	17	2	19	1055	89%	0.25
64	2014/15	RAPHAEL NZIKU	Male	1.98	pine	2	2	17	2	19	1055	89%	1.75
65	2014/15	ALFRED MPUNYA	Female	0.59	pine	0	2	17	2	19	1055	89%	1.85
66	2014/15	GODFRID SANGA	Male	0.54	pine	0	0	17	2	19	1055	89%	1.05
67	2014/15	SALOME MGAYA	Female	1.04	pine	2	2	16	2	18	1000	89%	2
68	2015/16	RASHID MLELWA	Male	0.67	pine	1	2	16	2	18	1000	89%	0.45
69	2014/15	JOHN MTWEVE	Male	1.19	pine	0	0	16	2	18	1000	89%	1.35
70	2014/15	MARTIN MLOWE	Male		pine	1	2	16	2	18	1000	89%	1.15
71	2014/15	ALFRED MPUNYA	Male		pine	0	2	16	2	18	1000	89%	1.5
72	2014/15	VITALIS MGIMBA	Male	0.77	pine	0	0	15	2	17	944	88%	1.8
73	2014/15	KASIAN MLELWA	Male	1.71	pine	0	1	15	2	17	944	88%	1.15
74	2014/15	WESTON MLIGO	Male		pine	0	1	15	2	17	944	88%	1.15
75	2015/16	GODFRID SANGA	Male	0.84	pine	0	0	21	3	24	1333	88%	0.35
76	2015/16	FIDEA MTEGA	Female	0.35	pine	1	0	21	3	24	1333	88%	0.35
77	2015/16	VALENTIN MGINA	Male	1.28	pine	0	0	20	3	23	1278	87%	0.35
78	2014/15	ASIA NGONGI	Male	0.96	pine	0	1	13	2	15	833	87%	1.05
79	2015/16	BLASIVUS MTEWA	Male	0.37	pine	0	0	19	3	22	1222	86%	0.5
80	2014/15	VALENTINA MTEGA	Female	1.21	pine	2	2	12	2	14	778	86%	2.55
81	2014/15	STANLEY MGEDZI	Male	1.38	pine	0	1	18	3	21	1166	86%	1.1
82	2015/16	ASIA NGONGI	Female	1.19	pine	0	0	18	3	21	1166	86%	0.45
83	2014/15	ADELINI MHULE	Male	0.94	pine	0	1	11	2	13	722	85%	0.55
84	2014/15	RASHIDI MLELWA	Female	1.36	pine	2	2	16	3	19	1055	84%	1.7
85	2015/16	RAINALD SAPULA	Male	1.33	pine	0	1	16	3	19	1055	84%	0.4

sRank	Pyear	Name	Gender	Area (acres)	Specie	WC	WS	Live	Dead	Total	Stock (stem/ha)	S-%	Hdom (metre)
86	2014/15	ALPONSI MWAGENI	Male	1.48	pine	0	1	16	3	19	1055	84%	1.1
87	2014/15	MELINA MLWILO	Male	0.74	pine	0	0	16	3	19	1055	84%	1.05
88	2015/16	ALFRED MPUNYA	Male	0.67	pine	0	0	16	3	19	1055	84%	0.35
89	2015/16	FILLO MLELWA	Female	0.57	pine	1	2	16	3	19	1055	84%	0.35
90	2014/15	FRANCE NZIKU	Male	1.53	pine	2	2	10	2	12	667	83%	1.5
91	2014/15	ROZI MKINGA	Female	1.06	pine	2	3	20	4	24	1333	83%	1.65
92	2015/16	TUMLUBAGE MTEGA	Female	0.69	pine	2	2	15	3	18	1000	83%	2.3
93	2014/15	NOLASKO MGEDZI	Male	0.99	pine	0	0	15	3	18	1000	83%	1
94	2015/16	LUCY LUOGA	Female	0.59	pine	1	1	15	3	18	1000	83%	0.3
95	2015/16	MARGRETH NJELEKELA	Female	1.16	pine	0	1	19	4	23	1278	83%	0.65
96	2015/16	IBRAHIM MLELWA	Male	0.42	pine	1	2	14	3	17	944	82%	0.35
97	2014/15	VALENTIN MGINA	Female	0.74	pine	0	0	14	3	17	944	82%	1.75
98	2014/15	MARGRETH NJELEKELA	Female	1.68	pine	0	0	14	3	17	944	82%	1.3
99	2015/16	ADELIN MHULE	Female	1.68	pine	0	0	14	3	17	944	82%	0.55
100	2015/16	ANGELA MLELWA	Female		pine	0	0	18	4	22	1222	82%	0.3
101	2015/16	ANTILIDA HAULE	Female	0.64	pine	0	1	18	4	22	1222	82%	0.35
102	2014/15	ALTO MLELWA	Male	0.94	pine	1	2	18	4	22	1222	82%	1.7
103	2014/15	FLORA MHEWA	Female	1.46	pine	2	2	16	4	20	1111	80%	1.55
104	2014/15	HELENA MTEGA	Female	1.31	pine	2	2	12	3	15	833	80%	2.05
105	2014/15	SUZAN KOMBA	Male	1.14	pine	2	2	16	4	20	1111	80%	1.65
106	2014/15	DEUKALA MLELWA	Female	1.21	pine	0	1	12	3	15	833	80%	1.3
107	2015/16	MARTIN MLOWE	Male	2.17	pine	0	0	16	4	20	1111	80%	0.35
108	2015/16	DOTTO MWALONGO	Male	0.91	pine	0	0	16	4	20	1111	80%	0.25
109	2014/15	FLOWIN MTEWA	Female	1.31	pine	0	0	8	2	10	555	80%	0.7
110	2015/16	EDGAR MKINGA	Male	0.44	pine	1	2	15	4	19	1055	79%	0.45
111	2014/15	PETRO MKORONGO	Male	0.99	pine	2	2	15	4	19	1055	79%	1.8
112	2015/16	VUMILIA MGENI	Female	1.16	pine	0	1	15	4	19	1055	79%	0.35
113	2015/16	MELINA MLWILO	Female	1.19	pine	0	0	15	4	19	1055	79%	0.35
114	2015/16	BENARD MLIGO	Male	2.35	pine	1	1	14	4	18	1000	78%	0.45

sRank	Pyear	Name	Gender	Area (acres)	Specie	WC	WS	Live	Dead	Total	Stock (stem/ha)	S-%	Hdom (metre)
115	2014/15	LUSIA MLOWE	Female	1.46	pine	2	2	14	4	18	1000	78%	1.8
116	2015/16	ANDREA MGAYA	Male	0.44	pine	1	2	14	4	18	1000	78%	0.35
117	2014/15	FABIAN MANGA	Male		pine	0	2	14	4	18	1000	78%	1.65
118	2015/16	FERDINAND KAYOMBO	Male	0.25	pine	1	1	14	4	18	1000	78%	0.3
119	2015/16	ALTO MLELWA	Male		pine	0	0	17	5	22	1222	77%	0.35
120	2015/16	WINFRID MGIMBA	Male	1.33	pine	0	0	17	5	22	1222	77%	0.45
121	2014/15	RASHIDI MLELWA	Male	0.79	pine	2	2	13	4	17	944	76%	1.95
122	2014/15	NELSON MLIGO	Male	1.68	pine	0	0	13	4	17	944	76%	1.05
123	2015/16	WESTON MLIGO	Male	1.31	pine	0	0	13	4	17	944	76%	0.25
124	2015/16	FERDINAND KAYOMBO	Male	0.52	pine	1	1	13	4	17	944	76%	0.35
125	2014/15	YUDA NYOCHO	Male	1.19	pine	2	2	16	5	21	1166	76%	2.05
126	2015/16	SELESTIN MGINA	Male		pine	1	1	16	5	21	1166	76%	0.45
127	2015/16	EDWIN MGAYA	Male	0.35	pine	2	2	15	5	20	1111	75%	0.45
128	2014/15	WINFRID MGIMB	Male	1.61	pine	0	2	12	4	16	889	75%	1.15
129	2015/16	SISILO KAYOMBO	Male	0.99	pine	0	0	12	4	16	889	75%	0.55
130	2014/15	FLOWIN MTEWA	Male	2.13	pine	0	0	12	4	16	889	75%	0.25
131	2015/16	IBRAHIM MLELWA	Male	0.35	pine	2	2	14	5	19	1055	74%	0.45
132	2014/15	FRANK MTWEVE	Male	1.33	pine	0	1	8	3	11	611	73%	1.5
133	2015/16	GETSEMAN MTEGA	Male	0.67	pine	0	1	13	5	18	1000	72%	0.3
134	2015/16	JASTIN MGIMBA	Male	0.44	pine	1	2	13	5	18	1000	72%	0.35
135	2015/16	IZACK MLOWE	Male	0.54	pine	1	2	13	5	18	1000	72%	0.3
136	2015/16	DEOKARA MLELWA	Female	1.16	pine	0	1	15	6	21	1166	71%	0.35
137	2015/16	MARY MLIGO	Female	1.19	pine	0	1	15	6	21	1166	71%	0.25
138	2015/16	EDWIN GAYA	Male	0.30	pine	1	1	17	7	24	1333	71%	0.65
139	2015/16	RASHID MLELWA	Male	2.03	pine	1	0	12	5	17	944	71%	0.7
140	2015/16	ROZI MKINGA	Female		pine	0	0	14	6	20	1111	70%	0.35
141	2014/15	TITHO HAULE	Male	2.69	pine	2	2	13	6	19	1055	68%	1.55
142	2015/16	VALERIA HAULE	Female	2.27	pine	1	1	13	6	19	1055	68%	0.4
143	2015/16	GETSEMAN MTEGA	Male	0.54	pine	1	1	13	6	19	1055	68%	0.25

sRank	Pyear	Name	Gender	Area (acres)	Specie	WC	WS	Live	Dead	Total	Stock (stem/ha)	S-%	Hdom (metre)
144	2015/16	NOLASCO MGEDZI	Male	1.51	pine	0	0	13	6	19	1055	68%	0.35
145	2015/16	NOELY MTONYA	Male	2.64	pine	1	1	13	7	20	1111	65%	0.25
146	2014/15	BRUNO MKORONGO	Male		pine	0	0	11	6	17	944	65%	0.35
147	2015/16	HELENA MTEGA	Female	2.57	pine	1	1	12	7	19	1055	63%	0.55
148	2015/16	NIKODEM MGINA	Male		pine	1	1	11	7	18	1000	61%	0.45
149	2015/16	ASUMTA MLELWA	Female	1.24	pine	0	0	12	8	20	1111	60%	0.25
150	2015/16	YUDITH MLIGO	Female	2.99	pine	1	1	11	8	19	1055	58%	0.55
151	2015/16	AMOS MWABENA	Male	0.30	pine	1	1	11	8	19	1055	58%	0.4
152	2015/16	YUDITH MLIGO	Female	2.13	pine	1	1	11	9	20	1111	55%	0.35
153	2015/16	MATHIAS MGAYA	Male	1.06	pine	0	1	12	10	22	1222	55%	0.35
154	2015/16	FRANK JACOB	Male	0.32	pine	2	2	9	8	17	944	53%	0.35
155	2015/16	FRANCE NZIKU	Male	2.30	pine	1	1	10	9	19	1055	53%	0.4
156	2015/16	LAMON KOMBA	Male	2.32	pine	1	1	10	9	19	1055	53%	0.35
157	2015/16	MARTHA MBILINYI	Female	1.21	pine	0	0	12	13	25	1389	48%	0.35
158	2015/16	FABIAN MANGA	Male	0.82	pine	0	1	10	11	21	1166	48%	0.35
159	2015/16	NEEMA MBWILO	Female	4.25	pine	1	1	9	10	19	1055	47%	0.35
160	2015/16	VALENTINA MTEGA	Female	2.22	pine	1	1	8	9	17	944	47%	0.3
161	2015/16	FLOWIN MGIMBA	Male	0.40	pine	0	0	8	9	17	944	47%	0.35
162	2015/16	JULIUS MPWAGE	Male	0.57	pine	1	1	8	10	18	1000	44%	0.4
163	2015/16	ANDREA MTEGA	Male		pine	0	0	7	11	18	1000	39%	0.35
164	2015/16	ANDREA MTEGA	Male		pine	0	0	7	12	19	1055	37%	0.35
165	2015/16	FLORA MHEWA	Female	2.59	pine	1	1	6	13	19	1055	32%	0.2
166	2015/16	IMELDA MHAGAMA	Female	2.40	pine	1	1	6	13	19	1055	32%	0.4
167	2015/16	BRIGITA MLELWA	Female		pine	0	0	6	13	19	1055	32%	0.4
168	2015/16	YUDA NYOCHO	Male	2.08	pine	1	1	1	6	7	389	14%	0.2
169	2015/16	TUMLUBAGE MTEGA	Female		pine	0	0	0	0	0	0		

Key:

sRank = Rank based on survival score
Name = Woodlot owner first and last name
Specie = tree type (name)
WS = Slash weeding
Dead = Dead seedling
Stock = Total number of seedling per hectare
Sdeath = Score for dead seedling

Pyear = Planting year
Area = Area of the woodlot in hectare
WC = Circle weeding
Live = Alive seedling
Total = Sum of seedling both dead and alive
s-% = Survival percentage
hdom = Average height of two dominant (tallest) tree

Annex 1

7. WOODLOT ASSESSMENT FIELD SURVEY FORM

Surveyors: _____ Date: _____

WOODLOT LOCATION & OWNERSHIP

8. Coordinates by GPS

9. GPS accuracy

--

10. Village: _____ District: _____

11. Woodlot owner Name, Phone number and ID number (if applicable):

12. Has the woodlot changed owner since establishment? No / Yes / Unknown

If Yes, fill in the original owner: _____

PLOT MEASUREMENTS

13. Number of trees alive in the plot

--

14. Number of trees dead in the plot

--

15. Total number of trees in the plot

--

16. Height of the plot tallest tree (in decimetres): _____ dm, Second tallest tree: _____ dm

17. In case there are dead trees, assess the likely main cause of death:

Suppression by weeds	<input type="checkbox"/>	Cattle trampling:	<input type="checkbox"/>
Fire damage	<input type="checkbox"/>	Drought stress:	<input type="checkbox"/>
Disease	<input type="checkbox"/>	Other:	<input type="checkbox"/>
Insect damage	<input type="checkbox"/>	(specify "Other" in remarks)	

GENERAL WOODLOT DATA

18. Species group: Pine / Eucalyptus
 / Teak

19. Level of circle weeding in the woodlot:

20. Level of slash weeding in the woodlot:

Scale: 0 – No weeding done
1 – Some weeding done, but not acceptably
2 – Weeding activities done acceptably
3 – Weeding activities done completely

ADDITIONAL REMARKS BY SURVEYORS

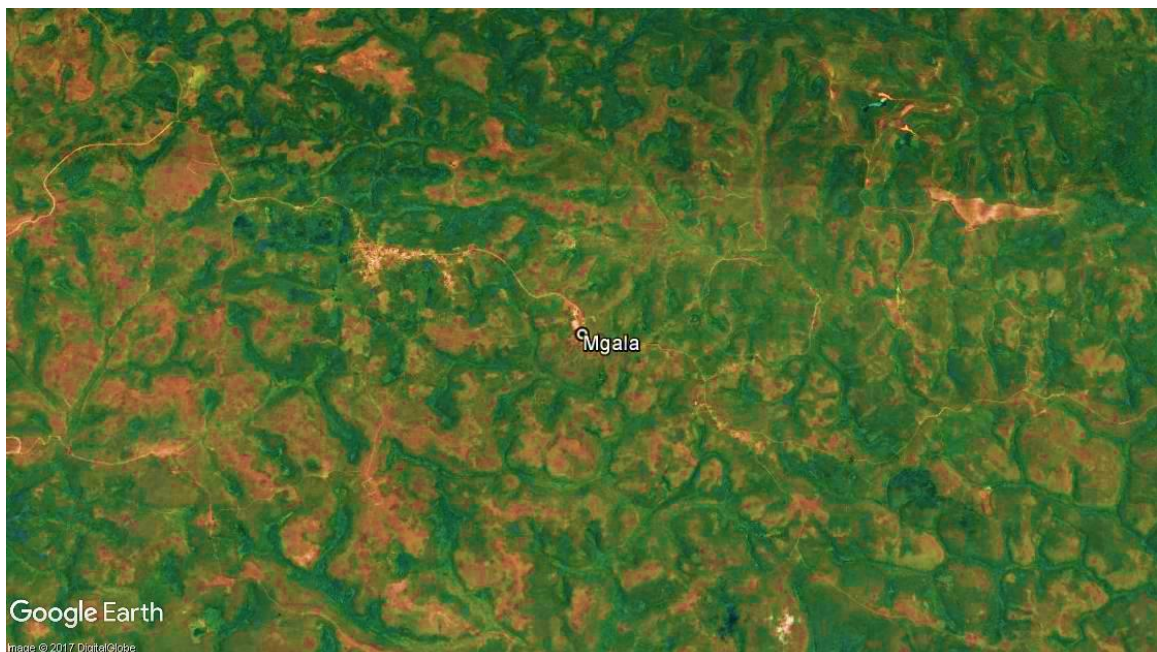
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End of Dry Season woodlot assessment 2016/17

End of Dry season survey feedback report for Mgala village

June 2017, Iringa, Tanzania



United Republic of Tanzania
**MINISTRY OF NATURAL RESOURCES
AND TOURISM**
Forestry and Beekeeping Division



**EMBASSY OF FINLAND
DAR ES SALAAM**

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LIST OF ANNEXES

Annex 1: Woodlot assessment field survey form

ABBREVIATIONS

GPS	Global Positioning System
PFP	Private Forestry Programme
TGIS	Tree Growing Incentive Scheme

1. INTRODUCTION

1.1. Background

The Private Forestry Programme (PFP) is a Finnish funded development aid programme designed to run from 2014 to 2030. It increases wealth in the Southern Highlands by promoting commercial management of smallholder plantations and wood processing enterprises.

This field survey was carried out in 25 villages that have been supported in planting trees by PFP. The field work was done from December 2016 to February 2017. The purpose of the field work was to assess the performance and management of the woodlots. The results will be used by PFP to improve its support models in the future.

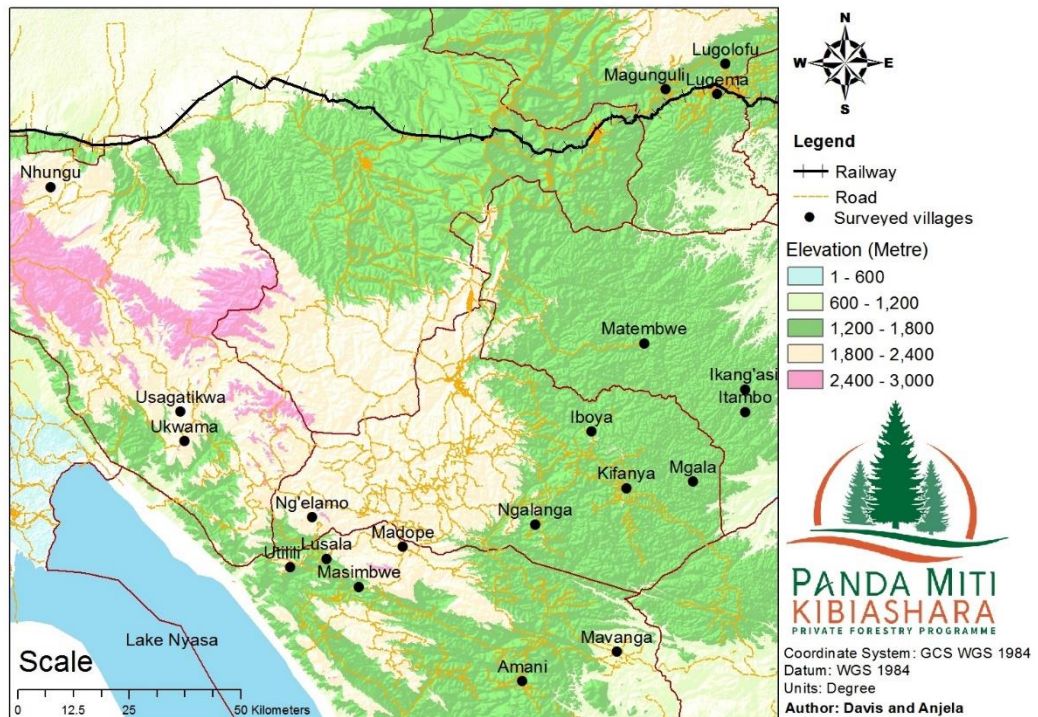
1.2. Objectives of the survey

- i. To assess the performance, survival, and level of management of the woodlots established through PFP support during the first two years of the programme.
- ii. To verify the status of the woodlots included in the PFP database.
- iii. To interview supported beneficiaries for collection of socioeconomic data.

2. LOCATION OF THE VILLAGE

Mgala village is situated between latitude $9^{\circ} 32'$ south and longitude $35^{\circ} 14'$ east. The village is found in the south western highland areas of Njombe town council in Njombe region and it is characterised as wet intermediate agro ecological zone (Figure. 1). The elevation ranges between 1200m to 1600m a.s.l.

Figure 27: A map showing the location of Mgala village with respect to other surveyed villages



3. METHODOLOGY

3.1. Field procedures

The field teams conducted the following activities while surveying the woodlots:

- ✚ Navigating to the woodlots using GPS receiver and support from local TGA personnel
- ✚ Then, a rope of radius of 7.57m was used to define the boundary of a sample plot within the woodlot
- ✚ Within the sample plots, the number of live and dead seedlings were counted (Annex 1).
- ✚ Also the level of weeding was assessed as shown in Table 1
- ✚ Metal bar was inserted for the 2015/16 established woodlots, so that they can be found later with a metal detector if needed.

Table 162 Classification for the level of weeding

Category/ Score	Title	Definition
0	No weeding done	There are practically no signs of weeding activities done during the past rainy season
1	Some weeding done, but not acceptably	There is clear evidence of weeding activities taken place during the past rainy season; however they have not been done sufficiently to ensure tree survival, good quality and good growth in the woodlot.
2	Weeding activities done acceptably	There are some shortcomings in the weeding activities, but the overall level is clearly sufficient to help ensure tree survival, good quality and good growth in the woodlot.
3	Weeding activities done completely	There are practically no signs of shortcomings, and all weeding activities appear to be conducted throughout the woodlot.

Key: The classification was reflected against the technical guidelines for circle and slash weeding as presented in the PFP TGIS guidelines. These require:

- Circle weeding: 50 cm radius to be cleared of weeds without damage to the tree in the middle.
- Slash weeding: all living weeds cut lower than 30 cm height.

It should be noted that no decisions of approval or disapproval for the level of weeding for support purposes were done in relation to this exercise.

3.2. Calculations and statistical analysis

- ✚ **Stand density (stems/ha):** the number of live trees plus number of dead trees in the sample plot, extended into a figure per hectare.
- ✚ **Survival percentage:** the share of live trees of the total number of trees in the sample plot.
- ✚ **Dominant height:** Average calculated from the two tallest tree heights measured in the sample plot. Assuming 3 x 3 m planting density, the figure represents the average height of the 100 tallest trees in a hectare.

3.3. Tools

- ✚ GPS receiver
- ✚ Smartphones installed with ODK collect tool
- ✚ PVC pipe and Rope of 7.57m radius
- ✚ Metal bar

4. RESULTS

4.1. Woodlots description

- ✚ A total of 38 woodlots owned by 21 beneficiaries surveyed (Table 2).
- ✚ The village surveyed woodlots comprised a total area of 592.90 acres supported by the programme through TGIS in kind (Table 2).

Table 163: Village total number and area of woodlots

Planting year/season	Beneficiaries	Number of woodlot	Total area (acres)
2014/15	Female	2	11.54
	Male	15	89.65
	Inst. &V.group	3	23.47
2015/16	Female	4	9.59
	Male	12	423.02
	Inst. &V.group	2	35.63
Grand Total		38	592.90

Key: Inst. &V.group = Institutions and vulnerable groups

4.2. Weeding

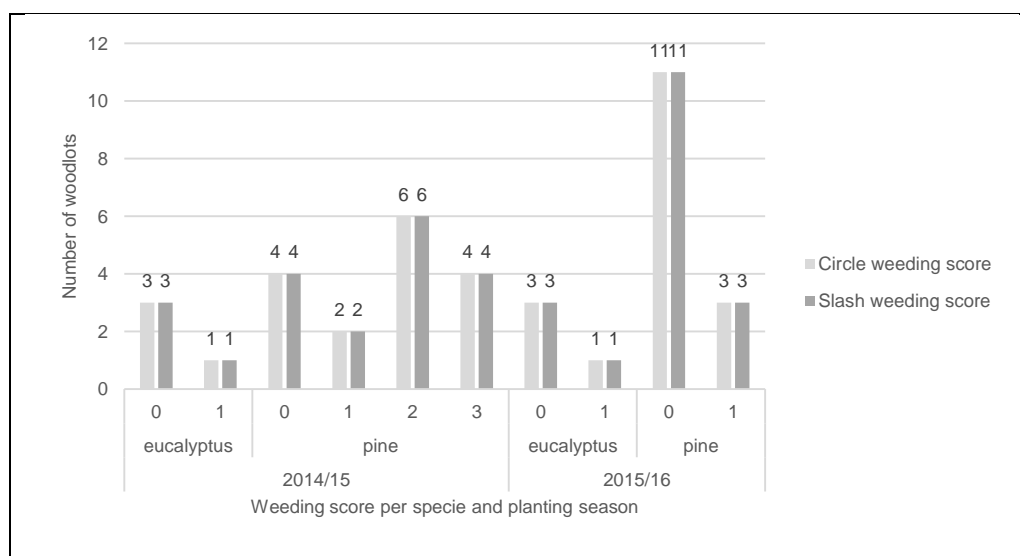
The observed score for both, circle and slash weeding were generally low (Table 3). The frequencies for assessed weeding scores are presented in Figure. 2.

Table 164 Mean circle weeding and slash weeding scores by specie group and year of stand establishment

Beneficiary	Specie group	Circle weeding		Slash weeding	
		2014/15	2015/16	2014/15	2015/16
Female	Pine	1.00	0.33	1.00	0.33
	Eucalyptus	0.00	1.00	1.00	0.00
Male	Pine	1.47	0.20	0.77	0.30
	Eucalyptus	0.00	0.00	0.00	0.00
Inst. &V.group	Pine	3.00	0.00	3.00	0.00
	Eucalyptus	1.00	0.00	0.00	0.00
Grand total		1.35	0.22	0.90	0.22

Key: Inst. &V.group = Institutions and vulnerable groups

Figure 28: Mean circle weeding and slash weeding scores by woodlots



4.3. Survival and stocking

4.3.1. Fire damage

Generally, at village level fire was not a major problem affecting survival of the tree seedling. Although, fire seems to be a major concern for the future development of the woodlots, hence mitigate measure are vital for sustainability of the woodlots.

4.3.2. Height growth

Mgala village mean dominant height was good as observed in Table 4.

Table 165: Mean dominant height description

Specie group	hdom (metre)	
	2014/15	2015/16
Pines	1.56	0.41
Eucalyptus	0.69	0.38
Grand total	1.13	0.39

Key: hdom = Dominant height

4.3.3. Survival and stocking

Table 5 below shows the general survival percentage and mean stocking for Mgala village. In general, the village average survival percentage was low, as compared to other villages (Table 6).

Table 166: Mean survival percentage description

Specie group	2014/15		2015/16	
	S-%	Stock (stem/ha)	S-%	Stock (stem/ha)
Pines	93	1014	46	1139
Eucalyptus	58	1042	71	1003
Grand total	86	1019	65	1111

Key: S-% = Survival percentage

Table 167: The rank of villages by average survival percentage

Village name	Average survival percentage	Rank
Matembwe	99%	1
Usagatikwa	95%	2
Kidabaga	95%	3
Lusala	90%	4
Kiyowela	89%	5
Ukwama	84%	6
Ngalanga	83%	7
Maguguli	83%	8
Madope	83%	9
Ng'elamo	82%	10
Kifanya	82%	11
Mavanga	82%	12
Ikang'asi	81%	13
Iboya	79%	14
Itambo	77%	15
Mgala	76%	16
Utilili	72%	17
Kiwalamo	72%	18
Lugema	70%	19
Lugolofu	69%	20
Amani	68%	21
Makungu	61%	22
Ukwega	59%	23
Masimbwe	54%	24
Nhungu	48%	25

4.4. Weeding

4.4.1. Circular weeding

Table 7 below shows the general circular weeding score for Mgala village. In general, the village average circular weeding score was low as compared to other villages (Table 8).

Table 168: Mean circular weeding score description

Specie group	Circle weeding score	
	2014/15	2015/16
Pines	1.63	0.21
Eucalyptus	0.25	0.25
Grand total	1.35	0.22

Table 169: The rank of villages by average circular weeding score

Villages	Average circular weeding score	Rank
Usagatikwa	1.84	1
Matembwe	1.45	2
Lugema	1.39	3
Lugolofu	1.20	4
Kiyowela	1.10	5
Maguguli	1.04	6
Kiwalamo	0.96	7
Ukwega	0.83	8
Iboya	0.83	9
Mgala	0.82	10
Nhungu	0.76	11
Mavanga	0.76	12
Ukwama	0.63	13
Lusala	0.60	14
Makungu	0.52	15
Kifanya	0.44	16
Kidabaga	0.33	17
Itambo	0.32	18
Ikang'asi	0.27	19
Ng'elamo	0.21	20
Amani	0.15	21
Utilili	0.15	22
Ngalanga	0.06	23
Madope	0.01	24
Masimbwe	0.00	25

4.4.2. Slash weeding

Table 9 below shows the general slash weeding score for Mgala village. In general, the village average slash weeding score was low as compared to other villages (Table 10).

Table 170: Mean slash weeding score description

Specie group	Slash weeding score	
	2014/15	2015/16
Pines	1.06	0.29
Eucalyptus	0.25	0.00
Grand total	0.90	0.22

Table 171: The rank of villages by average slash weeding score

Villages	Average slash weeding score	Rank
Kidabaga	2.00	1
Matembwe	1.73	2
Kiyowela	1.15	3
Mavanga	1.14	4
Lugema	1.11	5
Lusala	0.93	6
Maguguli	0.88	7
Kiwalamo	0.85	8
Ukwega	0.83	9
Makungu	0.76	10
Madope	0.66	11
Mgala	0.58	12
Usagatikwa	0.47	13
Kifanya	0.35	14
Lugolofu	0.35	15
Ukwama	0.34	16
Utilili	0.33	17
Ikang'asi	0.31	18
Itambo	0.30	19
Nhungu	0.27	20
Amani	0.26	21
Iboya	0.22	22
Ngalanga	0.11	23
Masimbwe	0.03	24
Ng'elamo	0.00	25

5. CONCLUSION AND RECOMMENDATION

Generally, the villagers are encouraged to increase effort in the woodlots management activities especially weeding, in order to obtain better survival, growth and quality of trees.

Results from the survey observed a slight correlation between the weeding and survival percentage of the woodlots in Mgala village. As described in Table 11, both, slash and circular weeding showed a negative and positive linear relationship to number of dead and live seedling respectively. This indicate that, woodlots with high weeding scores observed to have high number of live seedlings with less dead seedling.

Table 172: A correlation between weeding and survival score

Variable	Dead seedlings	Live seedlings
WC	-0.48	0.41
WS	-0.40	0.30

Key: WC = Circle weeding score WS = Slash weeding score

To some extent this information evaluate the need for weeding to increase survival percentage of the seedling in the woodlots. If both slash and circular weeding are done perfectly, then one could reduce the number of dead seedling and increase/maintain the number of live seedling in a particular woodlot. Scientifically weeding is proven to be vital for the survival of tree seedlings, since it reduces competition over nutrients, air and light between tree seedlings and weeds.

6. RESULTS FOR EACH INDIVIDUAL WOODLOT

Table 12 below shows the results for each individual beneficiary woodlots. It includes:

- ✚ Weeding score: both circular and slash weeding score
- ✚ Stem density (stem/ha)
- ✚ Survival percentage

Table 173: Village woodlots results

sRanks	Pyear	Name	Gender	Area (acres)	Specie	WC	WS	Live	Dead	Total	Stock (stem/ha)	S-%	Hdom (metre)
1	2014/15	JOVITUS RUGAHENDA	Male	8.03	pine	1	1	21	0	21	1166	100%	1.4
2	2014/15	ANTONY MFUGALE	Male	13.71	pine	2	0	20	0	20	1111	100%	1.75
3	2014/15	ALBERTO MFUGALE	Male	4.97	pine	2	3	20	0	20	1111	100%	1.2
4	2014/15	CHARLES MFUGALE	Male	3.56	pine	3	3	20	0	20	1111	100%	1.9
5	2014/15	CHALE MFUGALE	Male	4.47	pine	0	0	20	0	20	1111	100%	2.1
6	2015/16	FRANK MSIGWA	Male	15.47	pine	0	1	20	0	20	1111	100%	0.55
7	2014/15	FRANK MSIGWA	Male	4.97	pine	0	1	18	0	18	1000	100%	1.9
8	2014/15	OTTO MFUGALE	Male	3.76	pine	2	0	17	0	17	944	100%	0.95
9	2014/15	MWAFRIKA MFUGALE	Male	9.46	pine	2	2	14	0	14	778	100%	2
10	2015/16	OCTAVINA NGOLE	Female	2.22	pine	0	0	18	0	18	1000	100%	0.55
11	2015/16	OCTAVINA NGOLE	Female	2.17	pine	1	1	19	0	19	1055	100%	0.5
12	2015/16	BOSCO KILASI	Male	2.25	pine	0	0	22	0	22	1222	100%	0.55
13	2014/15	MGALA PRIMARY SCHOOL		2.25	pine	3	3	20	0	20	1111	100%	2.4
14	2014/15	MWAFRIKA MFUGALE	Male	9.46	pine	2	0	17	1	18	1000	94%	1.1
15	2014/15	OCTAVINA NGOLE	Female	5.34	pine	1	1	17	1	18	1000	94%	1.95
16	2015/16	MGALA PRIMARY SCHOOL		2.40	pine	0	0	15	1	16	889	94%	0.5
17	2015/16	ALBERTO MFUGALE	Male	14.04	pine	0	0	25	2	27	1500	93%	0.45
18	2015/16	ULRICK MTUNDU	Male	6.97	pine	1	0	16	2	18	1000	89%	0.35
19	2014/15	HALARD NGAKONDA	Male	7.24	pine	3	0	15	2	17	944	88%	1.45
20	2014/15	CRISTIAN MFUGALE	Male	2.37	pine	2	0	20	3	23	1278	87%	0.9
21	2014/15	OCTAVINA NGOLE	Female	6.20	eucalyptus	0	1	13	3	16	889	81%	1
22	2014/15	ULRICK MTUNDU	Male	6.62	pine	0	0	16	4	20	1111	80%	1.9
23	2014/15	SHIPO		19.79	eucalyptus	1	0	18	5	23	1278	78%	0.95
24	2015/16	MWAFRIKA MFUGALE	Male	17.45	pine	1	0	13	6	19	1055	68%	0.3
25	2015/16	DONATUS MMELO	Male	7.78	eucalyptus	0	0	11	7	18	1000	61%	0.15

26	2015/16	DAMASI KAMANI	Male	326.57	pine	0	2	11	7	18	1000	61%	0.45
27	2014/15	MWAFRIKA MFUGALE	Male	4.00	pine	0	0	15	11	26	1444	58%	0.55
28	2015/16	OCTAVINA NGOLE	Female	1.83	eucalyptus	1	0	15	12	27	1500	56%	0.3
29	2014/15	DONATUS MMELO	Male	4.72	eucalyptus	0	0	9	8	17	944	53%	0.55
30	2015/16	CASTORY MFUGALE	Male	11.98	pine	0	0	13	13	26	1444	50%	0.35
31	2015/16	CASTORY MFUGALE	Male	3.61	eucalyptus	0	0	8	9	17	944	47%	0.85
32	2015/16	JOVITUS RUGAHENDA	Male	11.10	pine	0	0	12	14	26	1444	46%	0.35
33	2015/16	MWAFRIKA 4 MFUGALE	Male	0.94	pine	0	0	6	9	15	833	40%	0.35
34	2015/16	BENWARD MMELO	Male	4.87	pine	0	0	5	16	21	1166	24%	0.25
35	2015/16	CHRISTIANA NJAWIKE	Female	3.36	pine	0	0	3	10	13	722	23%	0.25
36	2014/15	ELLY HONGOLI	Male	2.30	eucalyptus	0	0	4	15	19	1055	21%	0.25
37	2015/16	SHIPO		33.24	eucalyptus	0	0	4	16	20	1111	20%	0.2
38	2014/15	MGALA PRIMARY SCHOOL		1.43	pine	3	3				0	0%	

Key:	sRank	=	Rank based on survival score	Pyear	=	Planting year
	Name	=	Woodlot owner first and last name	Area	=	Area of the woodlot in hectare
	Specie	=	tree type (name)	WC	=	Circle weeding
	WS	=	Slash weeding	Live	=	Alive seedling
	Dead	=	Dead seedling	Total	=	Sum of seedling both dead and alive
	Stock	=	Total number of seedling per hectare	s-%	=	Survival percentage
	Sdeath	=	Score for dead seedling	hdom	=	Average height of two dominant (tallest) tree

Annex 1

7. WOODLOT ASSESSMENT FIELD SURVEY FORM

Surveyors: _____ Date: _____

WOODLOT LOCATION & OWNERSHIP

8. Coordinates by GPS

9. GPS accuracy

--

10. Village: _____ District: _____

11. Woodlot owner Name, Phone number and ID number (if applicable):

12. Has the woodlot changed owner since establishment? No / Yes / Unknown

If Yes, fill in the original owner: _____

PLOT MEASUREMENTS

13. Number of trees alive in the plot

--

14. Number of trees dead in the plot

--

15. Total number of trees in the plot

--

16. Height of the plot tallest tree (in decimetres): _____ dm, Second tallest tree: _____ dm

17. In case there are dead trees, assess the likely main cause of death:

Suppression by weeds <input type="checkbox"/>	Cattle trampling: <input type="checkbox"/>
Fire damage <input type="checkbox"/>	Drought stress: <input type="checkbox"/>
Disease <input type="checkbox"/>	Other: <input type="checkbox"/>
Insect damage <input type="checkbox"/>	(specify "Other" in remarks)

GENERAL WOODLOT DATA

18. Species group: Pine / Eucalyptus
 / Teak

19. Level of circle weeding in the woodlot:

20. Level of slash weeding in the woodlot:

Scale: 0 – No weeding done
 1 – Some weeding done, but not acceptably
 2 – Weeding activities done acceptably
 3 – Weeding activities done completely

ADDITIONAL REMARKS BY SURVEYORS

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End of Dry Season woodlot assessment 2016/17

End of Dry season survey feedback report for Ngalanga village

June 2017, Iringa, Tanzania



United Republic of Tanzania
**MINISTRY OF NATURAL RESOURCES
AND TOURISM**
Forestry and Beekeeping Division



**EMBASSY OF FINLAND
DAR ES SALAAM**

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LIST OF ANNEXES

Annex 1: Woodlot assessment field survey form

ABBREVIATIONS

GPS Global Positioning System
PFP Private Forestry Programme
TGIS Tree Growing Incentive Scheme

1. INTRODUCTION

1.1. Background

The Private Forestry Programme (PFP) is a Finnish funded development aid programme designed to run from 2014 to 2030. It increases wealth in the Southern Highlands by promoting commercial management of smallholder plantations and wood processing enterprises.

This field survey was carried out in 25 villages that have been supported in planting trees by PFP. The field work was done from December 2016 to February 2017. The purpose of the field work was to assess the performance and management of the woodlots. The results will be used by PFP to improve its support models in the future.

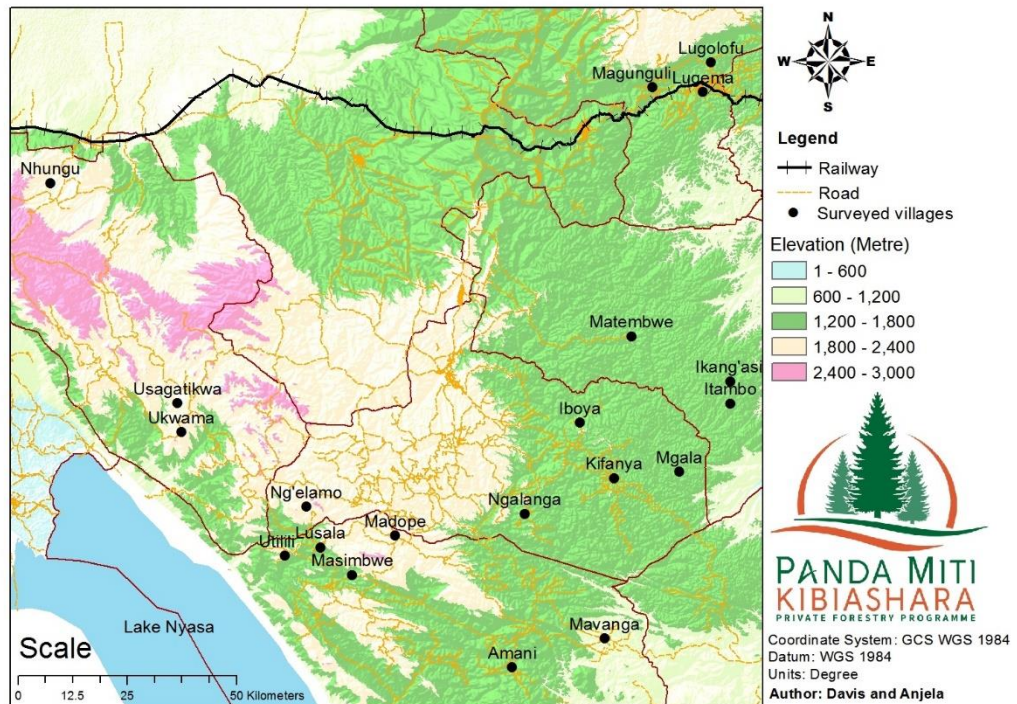
1.2. Objectives of the survey

- i. To assess the performance, survival, and level of management of the woodlots established through PFP support during the first two years of the programme.
- ii. To verify the status of the woodlots included in the PFP database.
- iii. To interview supported beneficiaries for collection of socioeconomic data.

2. LOCATION OF THE VILLAGE

Ngalanga village is situated between latitude 9° 37' south and longitude 34° 55' east. The village is found in the southern highland areas of Njombe town council in Njombe region (Figure. 1). The elevation ranges between 1500m to 1800m a.s.l.

Figure 29: A map showing the location of Ngalanga village with respect to other surveyed villages



3. METHODOLOGY

3.1. Field procedures

The field teams conducted the following activities while surveying the woodlots:

- ✚ Navigating to the woodlots using GPS receiver and support from local TGA personnel
- ✚ Then, a rope of radius of 7.57m was used to define the boundary of a sample plot within the woodlot
- ✚ Within the sample plots, the number of live and dead seedlings were counted (Annex 1).
- ✚ Also the level of weeding was assessed as shown in Table 1
- ✚ Metal bar was inserted for the 2015/16 established woodlots, so that they can be found later with a metal detector if needed.

Table 174 Classification for the level of weeding

Category/ Score	Title	Definition
0	No weeding done	There are practically no signs of weeding activities done during the past rainy season
1	Some weeding done, but not acceptably	There is clear evidence of weeding activities taken place during the past rainy season; however they have not been done sufficiently to ensure tree survival, good quality and good growth in the woodlot.
2	Weeding activities done acceptably	There are some shortcomings in the weeding activities, but the overall level is clearly sufficient to help ensure tree survival, good quality and good growth in the woodlot.
3	Weeding activities done completely	There are practically no signs of shortcomings, and all weeding activities appear to be conducted throughout the woodlot.

Key: The classification was reflected against the technical guidelines for circle and slash weeding as presented in the PFP TGIS guidelines. These require:

- Circle weeding: 50 cm radius to be cleared of weeds without damage to the tree in the middle.
- Slash weeding: all living weeds cut lower than 30 cm height.

It should be noted that no decisions of approval or disapproval for the level of weeding for support purposes were done in relation to this exercise.

3.2. Calculations and statistical analysis

- ✚ **Stand density (stems/ha):** the number of live trees plus number of dead trees in the sample plot, extended into a figure per hectare.
- ✚ **Survival percentage:** the share of live trees of the total number of trees in the sample plot.
- ✚ **Dominant height:** Average calculated from the two tallest tree heights measured in the sample plot. Assuming 3 x 3 m planting density, the figure represents the average height of the 100 tallest trees in a hectare.

3.3. Tools

- ✚ GPS receiver
- ✚ Smartphones installed with ODK collect tool
- ✚ PVC pipe and Rope of 7.57m radius
- ✚ Metal bar

4. RESULTS

4.1. Woodlots description

- ✚ A total of 80 woodlots owned by 55 beneficiaries surveyed (Table 2).
- ✚ The village surveyed woodlots comprised a total area of 618.53 acres supported by the programme through TGIS in kind (Table 2).

Table 175: Village total number and area of woodlots

Planting year/season	Beneficiaries	Number of woodlot	Total area (acres)
2014/15	Female	5	28.99
	Male	27	168.06
2015/16	Female	11	87.33
	Male	35	328.95
	Inst. &V.group	2	5.21
Grand Total		80	618.53

Key: Inst. &V.group = Institutions and vulnerable groups

4.2. Weeding

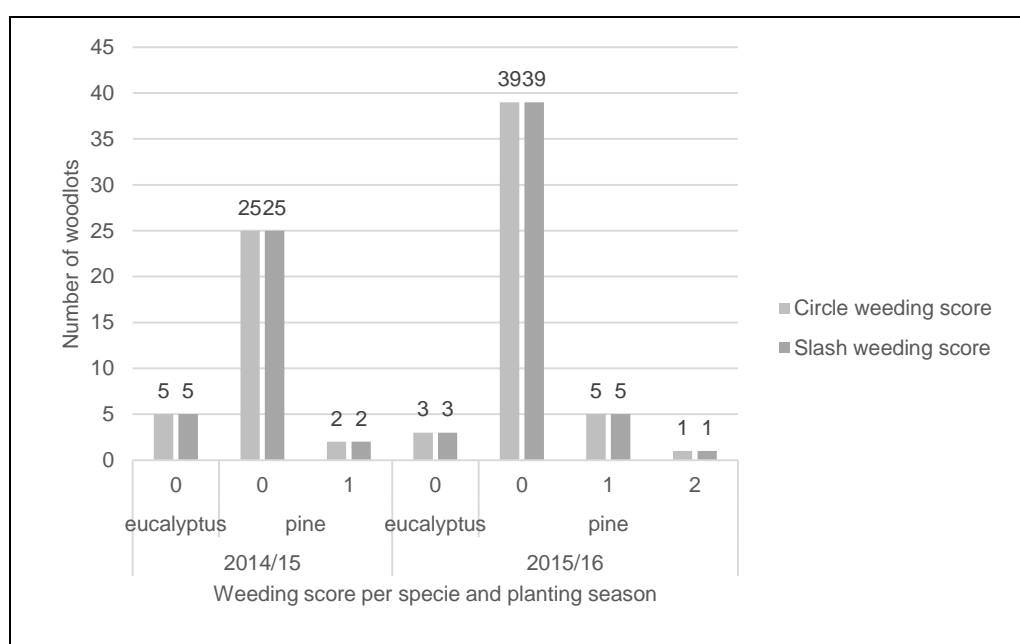
The observed score for both, circle and slash weeding were generally low (Table 3). The frequencies for assessed weeding scores are presented in Figure. 2.

Table 176 Mean circle weeding and slash weeding scores by specie group and year of stand establishment

Beneficiary	Specie group	Circle weeding		Slash weeding	
		2014/15	2015/16	2014/15	2015/16
Female	Pine	0.00	0.09	0.00	0.27
Male	Eucalyptus	0.00	0.00	0.00	0.00
	Pine	0.05	0.09	0.09	0.09
Inst. &V.group	pine	n/a	0.00	n/a	0.50
Grand total		0.03	0.08	0.06	0.15

Key: Inst. &V.group = Institutions and vulnerable groups

Figure 30: Mean circle weeding and slash weeding scores by woodlots



4.3. Survival and stocking

4.3.1. Fire damage

Generally, fire was not a major problem affecting survival of the tree seedling at Ngalanga village. A total of 2 woodlots equivalent to 17.00 acres were affected by fire (Table 4), hence mitigate measure are vital for sustainability of the woodlots.

Table 177: Description of the woodlot damaged by fire

S/N	Remarks	Number
1	Number of woodlots	2
2	Area (acres)	17.00

4.3.2. Height growth

Ngalanga village mean dominant height was good as observed in Table 5.

Table 178: Mean dominant height description

Specie group	hdom (metre)	
	2014/15	2015/16
Pines	1.36	0.42
Eucalyptus	1.98	0.40
Grand total	1.46	0.41

Key: hdom = Dominant height

4.3.3. Survival and stocking

Table 6 below shows the general survival percentage and mean stocking for Ngalanga village. In general, the village average survival percentage was low, as compared to other villages (Table 7).

Table 179: Mean survival percentage description

Specie group	2014/15		2015/16	
	S-%	Stock (stem/ha)	S-%	Stock (stem/ha)
Pines	90%	1183	82%	1059
Eucalyptus	73%	1300	60%	1389
Grand total	87%	1201	81%	1080

Key: S-% = Survival percentage

Table 180: The rank of villages by average survival percentage

Village name	Average survival percentage	Rank
Matembwe	99%	1
Usagatikwa	95%	2
Kidabaga	95%	3
Lusala	90%	4
Kiyowela	89%	5
Ukwama	84%	6
Ngalanga	83%	7
Maguguli	83%	8
Madope	83%	9
Ng'elamo	82%	10
Kifanya	82%	11
Mavanga	82%	12
Ikang'asi	81%	13
Iboya	79%	14
Itambo	77%	15
Mgala	76%	16
Utilili	72%	17
Kiwalamo	72%	18
Lugema	70%	19
Lugolofu	69%	20
Amani	68%	21
Makungu	61%	22
Ukwega	59%	23
Masimbwe	54%	24
Nhungu	48%	25

4.4. Weeding

4.4.1. Circular weeding

Table 8 below shows the general circular weeding score for Ngalanga village. In general, the village average circular weeding score was low as compared to other villages (Table 9).

Table 181: Mean circular weeding score description

Specie group	Circle weeding score	
	2014/15	2015/16
Pines	0.04	0.09
Eucalyptus	0.00	0.00
Grand total	0.03	0.08

Table 182: The rank of villages by average circular weeding score

Villages	Average circular weeding score	Rank
Usagatikwa	1.84	1
Matembwe	1.45	2
Lugema	1.39	3
Lugolofu	1.20	4
Kiyowela	1.10	5
Maguguli	1.04	6
Kiwalamo	0.96	7
Ukwega	0.83	8
Iboya	0.83	9
Mgala	0.82	10
Nhungu	0.76	11
Mavanga	0.76	12
Ukwama	0.63	13
Lusala	0.60	14
Makungu	0.52	15
Kifanya	0.44	16
Kidabaga	0.33	17
Itambo	0.32	18
Ikang'asi	0.27	19
Ng'elamo	0.21	20
Amani	0.15	21
Utilili	0.15	22
Ngalanga	0.06	23
Madope	0.01	24
Masimbwe	0.00	25

4.4.2. Slash weeding

Table 10 below shows the general slash weeding score for Ngalanga village. In general, the village average slash weeding score was low as compared to other villages (Table 11).

Table 183: Mean slash weeding score description

Specie group	Slash weeding score	
	2014/15	2015/16
Pines	0.07	0.16
Eucalyptus	0.00	0.00
Grand total	0.07	0.16

Table 184: The rank of villages by average slash weeding score

Villages	Average slash weeding score	Rank
Kidabaga	2.00	1
Matembwe	1.73	2
Kiyowela	1.15	3
Mavanga	1.14	4
Lugema	1.11	5
Lusala	0.93	6
Maguguli	0.88	7
Kiwalamo	0.85	8
Ukwega	0.83	9
Makungu	0.76	10
Madope	0.66	11
Mgala	0.58	12
Usagatikwa	0.47	13
Kifanya	0.35	14
Lugolofu	0.35	15
Ukwama	0.34	16
Utilili	0.33	17
Ikang'asi	0.31	18
Itambo	0.30	19
Nhungu	0.27	20
Amani	0.26	21
Iboya	0.22	22
Ngalanga	0.11	23
Masimbwe	0.03	24
Ng'elamo	0.00	25

5. CONCLUSION AND RECOMMENDATION

Generally, the villagers are encouraged to increase effort in the woodlots management activities especially weeding, in order to obtain better survival, growth and quality of trees.

Results from the survey observed a slight correlation between the weeding and survival percentage of the woodlots in Ngalanga village. As described in Table 12, both, slash and circular weeding showed a negative and positive linear relationship to number of dead and live seedling respectively. This indicate that, woodlots with high weeding scores observed to have high number of live seedlings with less dead seedling.

Table 185: A correlation between weeding and survival score

Variable	Dead seedlings	Live seedlings
WC	-0.013	0.05
WS	-0.08	0.08

Key: WC = Circle weeding score WS = Slash weeding score

To some extent this information evaluate the need for weeding to increase survival percentage of the seedling in the woodlots. If both slash and circular weeding are done perfectly, then one could reduce the number of dead seedling and increase/maintain the number of live seedling in a particular woodlot. Scientifically weeding is proven to be vital for the survival of tree seedlings, since it reduces competition over nutrients, air and light between tree seedlings and weeds.

6. RESULTS FOR EACH INDIVIDUAL WOODLOT

Table 13 below shows the results for each individual beneficiary woodlots. It includes:

- ✚ Weeding score: both circular and slash weeding score
- ✚ Stem density (stem/ha)
- ✚ Survival percentage

Table 186: Village woodlots results

sRank	Pyear	Name	Gender	Area (acres)	Specie	WC	WS	Live	Dead	Total	Stock	S-%	Hdom (metre)
1	2015/16	EMMANUEL MLOWE	Male	4.47	pine	0	0	22	0	22	1222	100%	0.85
2	2014/15	EVODIUS NZIKU	Male	10.43	pine	0	0	24	0	24	1333	100%	1.2
3	2015/16	PETER J MLOWE	Male	12.03	pine	0	0	15	0	15	833	100%	1.25
4	2014/15	AURELIAN MAYEMBA	Female	6.67	pine	0	0	25	0	25	1389	100%	1.05
5	2014/15	SOLANUS MLOWE	Male	3.21	pine	0	0	21	0	21	1166	100%	2.45
6	2014/15	EVARISTO MLOWE	Male	5.56	pine	0	1	22	0	22	1222	100%	1.75
7	2014/15	FODIUS LUPUMBWE	Male	8.08	pine	0	0	19	0	19	1055	100%	1.65
8	2014/15	LEONARD MTEWELE	Male	11.10	pine	0	0	14	0	14	778	100%	1.3
9	2014/15	SIXTUS MTEWELE	Male	5.44	pine	0	0	17	0	17	944	100%	1.3
10	2014/15	STANSLAUS MCHAMI	Female	3.63	pine	0	0	24	0	24	1333	100%	1.55
11	2015/16	REGINALD DANDA	Male	28.00	pine	0	1	24	0	24	1333	100%	2.45
12	2015/16	ENHARD MWENDA	Male	8.90	pine	0	0	20	0	20	1111	100%	0.65
13	2014/15	ENHARD MWENDA	Male	7.56	pine	0	0	16	0	16	889	100%	1.55
14	2015/16	ENHARD MWENDA	Male	4.42	pine	0	0	12	0	12	667	100%	0.35
15	2015/16	PENDO KIHEGA	Female	8.70	pine	1	0	14	0	14	778	100%	0.45
16	2014/15	ONESPHOLA MLYUKA	Male	3.58	pine	0	0	21	0	21	1166	100%	1.35
17	2015/16	ADREHEM MAYEMBA	Male	6.45	pine	1	0	23	0	23	1278	100%	0.55
18	2015/16	ISAACK MCHAMI	Male	34.05	pine	0	0	23	0	23	1278	100%	0.45
19	2015/16	MODUSTUS MFUSE	Male	3.83	pine	0	0	19	0	19	1055	100%	0.6
20	2015/16	ADDU MWAGENI	Male	6.72	pine	0	0	18	0	18	1000	100%	2.3
21	2015/16	NGALANGA PRIMARY SCHOOL		1.41	pine	0	0	17	0	17	944	100%	0.35
22	2015/16	EVARISTO TEWELE	Male	0.00	pine	0	0	19	0	19	1055	100%	1.35
23	2014/15	DAVID MLOWE	Male	7.49	pine	0	0	21	1	22	1222	95%	1.35
24	2014/15	PHELIX KIHEGA	Male	7.91	pine	0	0	20	1	21	1166	95%	1.35
25	2014/15	PHELIX KIHEGA	Male	3.85	pine	1	0	18	1	19	1055	95%	1.25

sRank	Pyear	Name	Gender	Area (acres)	Specie	WC	WS	Live	Dead	Total	Stock	S-%	Hdom (metre)
26	2015/16	PETER MLOWE	Male	10.06	pine	1	0	18	1	19	1055	95%	0.35
27	2014/15	ERASTO KIHEGA	Male	3.16	pine	0	0	21	1	22	1222	95%	1.35
28	2015/16	ANGELINA MTUNDU	Female	9.86	pine	0	1	19	1	20	1111	95%	1.75
29	2015/16	ERASTO KIHENGA	Male	3.51	pine	0	0	18	1	19	1055	95%	0.55
30	2015/16	THEODORI MWAGENI	Male	8.97	pine	0	0	21	1	22	1222	95%	0.4
31	2014/15	SINDWELE PETER	Female	0.00	pine	0	0	18	1	19	1055	95%	1.15
32	2014/15	REGINALD DANDA	Male	10.92	eucalyptus	0	0	15	1	16	889	94%	3.1
33	2015/16	MARTIN MTUNDU	Male	16.48	pine	0	0	13	1	14	778	93%	0.75
34	2015/16	ANNITHA MWAGALA	Female	5.31	pine	0	0	14	1	15	833	93%	1.3
35	2014/15	ENELINA TWEVE	Female	14.33	pine	0	0	24	2	26	1444	92%	1.35
36	2015/16	AGNES NGELANGELA	Female	3.93	pine	0	0	22	2	24	1333	92%	0.35
37	2015/16	AGNES NGELANGELA	Female	6.55	pine	0	0	35	3	38	2111	92%	0.45
38	2015/16	ERASTO KIHEGA	Male	5.71	pine	0	0	20	2	22	1222	91%	0.45
39	2015/16	FELISTAS MAYEMBA	Male	13.66	pine	0	0	21	2	23	1278	91%	0.85
40	2014/15	PETRO J DANDA	Male	10.30	pine	0	0	18	2	20	1111	90%	1.5
41	2015/16	FODIUS LUPUMBWE	Male	2.32	pine	0	0	16	2	18	1000	89%	0.5
42	2014/15	ATILIO DANDA	Male	14.41	pine	0	0	16	2	18	1000	89%	1.25
43	2015/16	CHRISTOPHER MLOWE	Male	10.92	pine	0	0	21	3	24	1333	88%	0.55
44	2015/16	REGINALD DANDA	Male	4.82	pine	0	0	14	2	16	889	88%	1.65
45	2015/16	REGINALD DANDA	Male	36.25	pine	0	2	14	2	16	889	88%	0.75
46	2014/15	FAUSTINE MWAGEN1	Male	2.47	pine	0	0	20	3	23	1278	87%	1.25
47	2014/15	CHRISTOPHER MLOWE	Male	4.30	eucalyptus	0	0	18	3	21	1166	86%	0.85
48	2015/16	AURELIAN MAYEMBA	Female	5.98	pine	0	0	18	3	21	1166	86%	0.7
49	2014/15	YOAKIM MSEMWA	Male	0.00	pine	0	1	18	3	21	1166	86%	2.15
50	2014/15	ALBENTINA LWEKELA	Female	4.35	pine	0	0	25	4	29	1611	86%	1.4

sRank	Pyear	Name	Gender	Area (acres)	Specie	WC	WS	Live	Dead	Total	Stock	S-%	Hdom (metre)
51	2014/15	REGINALD DANDA	Male	2.72	eucalyptus	0	0	23	4	27	1500	85%	3.55
52	2015/16	MODESTUS MFUSE	Male	3.88	pine	0	0	17	3	20	1111	85%	0.35
53	2015/16	ONESFORA MLYUKA	Female	5.73	pine	0	0	10	2	12	667	83%	0.25
54	2014/15	NICOLAUS MAPHWILA	Male	9.44	pine	0	0	20	4	24	1333	83%	1
55	2015/16	ENHARD MWENDA	Male	1.19	eucalyptus	0	0	20	4	24	1333	83%	0.35
56	2015/16	DAVID MLOWE	Male	3.43	pine	0	0	17	4	21	1166	81%	0.25
57	2015/16	MENDORA MFUSE	Female	3.78	pine	0	1	13	3	16	889	81%	0.35
58	2014/15	NASHON SIYOVELA	Male	4.89	pine	0	0	16	4	20	1111	80%	0.85
59	2015/16	ALEX MLOWE	Male	8.18	pine	0	0	17	5	22	1222	77%	0.25
60	2015/16	EVODIUS NZIKU	Male	7.26	pine	0	0	17	5	22	1222	77%	0.45
61	2014/15	REGINALD DANDA	Male	2.10	eucalyptus	0	0	16	5	21	1166	76%	1.95
62	2014/15	EVARISTO LWEKELA	Male	4.10	pine	0	0	15	5	20	1111	75%	1.2
63	2015/16	ANGELINA MTUNDU	Female	14.68	pine	0	1	14	5	19	1055	74%	0.65
64	2014/15	REINHAD MLOWE	Male	8.90	pine	0	0	21	8	29	1611	72%	1.1
65	2015/16	EVODIUS NZIKU	Male	2.40	pine	0	0	16	7	23	1278	70%	0.35
66	2015/16	ENHARD MWENDA	Male	0.64	eucalyptus	0	0	15	7	22	1222	68%	0.45
67	2015/16	THEODORA MLOWE	Female	16.04	pine	0	0	8	4	12	667	67%	0.25
68	2015/16	METOD LWEKELA	Male	1.85	pine	0	0	19	11	30	1666	63%	0.35
69	2015/16	ALFRED MALUMA	Male	23.01	pine	0	0	11	8	19	1055	58%	0.35
70	2015/16	ERASMO KIHEGA	Male	1.28	pine	0	0	13	10	23	1278	57%	0.55
71	2014/15	ALBENTINA LWEKELA	Male	8.11	pine	0	0	13	10	23	1278	57%	1.55
72	2014/15	ALEX MLOWE	Male	7.31	pine	0	0	9	7	16	889	56%	0.65
73	2015/16	NOLASCO MLYUKA	Male	7.22	pine	0	0	7	9	16	889	44%	0.45
74	2015/16	COSMAS MAYEMBA	Male	19.40	pine	1	0	6	15	21	1166	29%	0.15
75	2015/16	PETER J MLOWE	Male	10.63	eucalyptus	0	0	8	21	29	1611	28%	0.45

sRank	Pyear	Name	Gender	Area (acres)	Specie	WC	WS	Live	Dead	Total	Stock	S-%	Hdom (metre)
76	2014/15	FADHILI S MGAYA	Male	0.72	eucalyptus	0	0	8	24	32	1777	25%	0.45
77	2015/16	SARA MLELWA	Female	6.77	pine	0	0	2	14	16	889	13%	0.15
78	2015/16	TAG NGALANGA		3.81	pine	0	1	0	29	29	1611	0%	
79	2015/16	LEONARD MTEWELE	Male	9.64	pine	0	0	0	0	0	0		
80	2015/16	HILDEBLAND MGANI	Male	7.36	pine	0	0				0		

Key:	sRank	=	Rank based on survival score	Pyear	=	Planting year
	Name	=	Woodlot owner first and last name	Area	=	Area of the woodlot in hectare
	Specie	=	tree type (name)	WC	=	Circle weeding
	WS	=	Slash weeding	Live	=	Alive seedling
	Dead	=	Dead seedling	Total	=	Sum of seedling both dead and alive
	Stock	=	Total number of seedling per hectare	s-%	=	Survival percentage
	Sdeath	=	Score for dead seedling	hdom	=	Average height of two dominant (tallest) tree

Form Number:

Annex 1

1. WOODLOT ASSESSMENT FIELD SURVEY FORM

Surveyors: _____ Date: _____

WOODLOT LOCATION & OWNERSHIP

2. Coordinates by GPS

3. GPS accuracy

4. Village: _____ District: _____

5. Woodlot owner Name, Phone number and ID number (if applicable):

6. Has the woodlot changed owner since establishment? No / Yes / Unknown

If Yes, fill in the original owner: _____

PLOT MEASUREMENTS

7. Number of trees alive in the plot

8. Number of trees dead in the plot

9. Total number of trees in the plot

10. Height of the plot tallest tree (in decimetres): _____ dm, Second tallest tree: _____ dm

11. In case there are dead trees, assess the likely main cause of death:

Suppression by weeds

Cattle trampling:

Fire damage

Drought stress:

Disease

Other:

Insect damage

(specify "Other" in remarks)

GENERAL WOODLOT DATA

12. Species group: Pine / Eucalyptus / Teak

Scale: 0 – No weeding done
1 – Some weeding done, but not acceptably

13. Level of circle weeding in the woodlot: _____

14. Level of slash weeding in the woodlot: _____

2 – Weeding activities done acceptably
3 – Weeding activities done completely

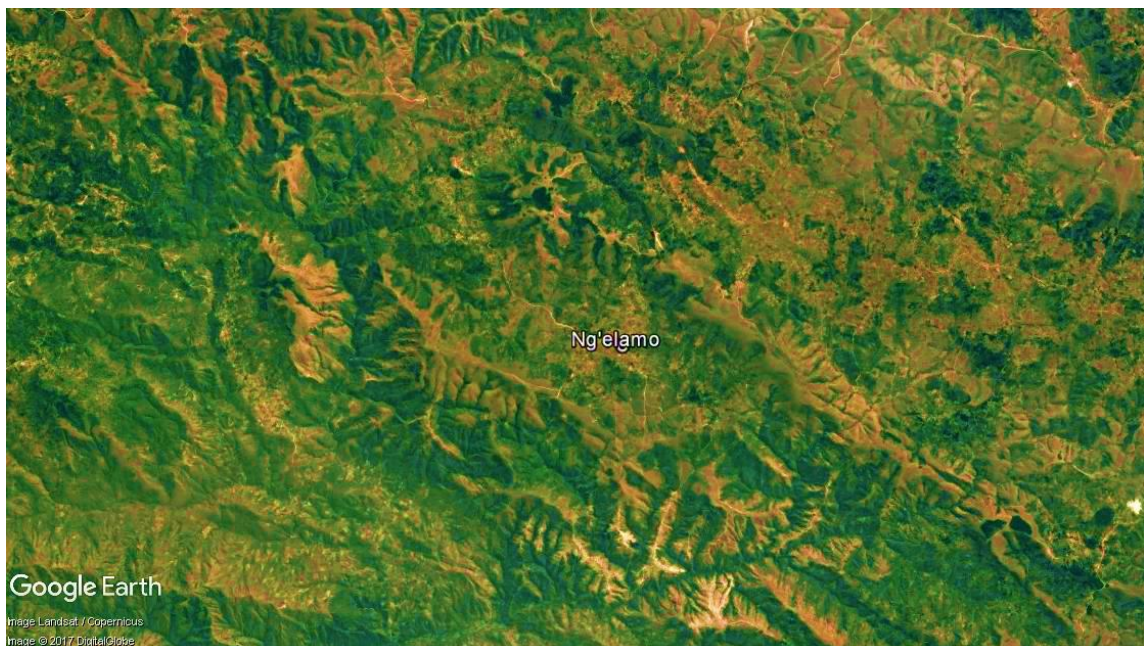
ADDITIONAL REMARKS BY SURVEYORS



End of Dry Season woodlot assessment 2016/17

End of Dry season survey feedback report for Ng'elamo village

June 2017, Iringa, Tanzania



United Republic of Tanzania
**MINISTRY OF NATURAL RESOURCES
AND TOURISM**
Forestry and Beekeeping Division



**EMBASSY OF FINLAND
DAR ES SALAAM**

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LIST OF ANNEXES

Annex 1: Woodlot assessment field survey form

ABBREVIATIONS

GPS Global Positioning System
PFP Private Forestry Programme
TGIS Tree Growing Incentive Scheme

1. INTRODUCTION

1.1. Background

The Private Forestry Programme (PFP) is a Finnish funded development aid programme designed to run from 2014 to 2030. It increases wealth in the Southern Highlands by promoting commercial management of smallholder plantations and wood processing enterprises.

This field survey was carried out in 25 villages that have been supported in planting trees by PFP. The field work was done from December 2016 to February 2017. The purpose of the field work was to assess the performance and management of the woodlots. The results will be used by PFP to improve its support models in the future.

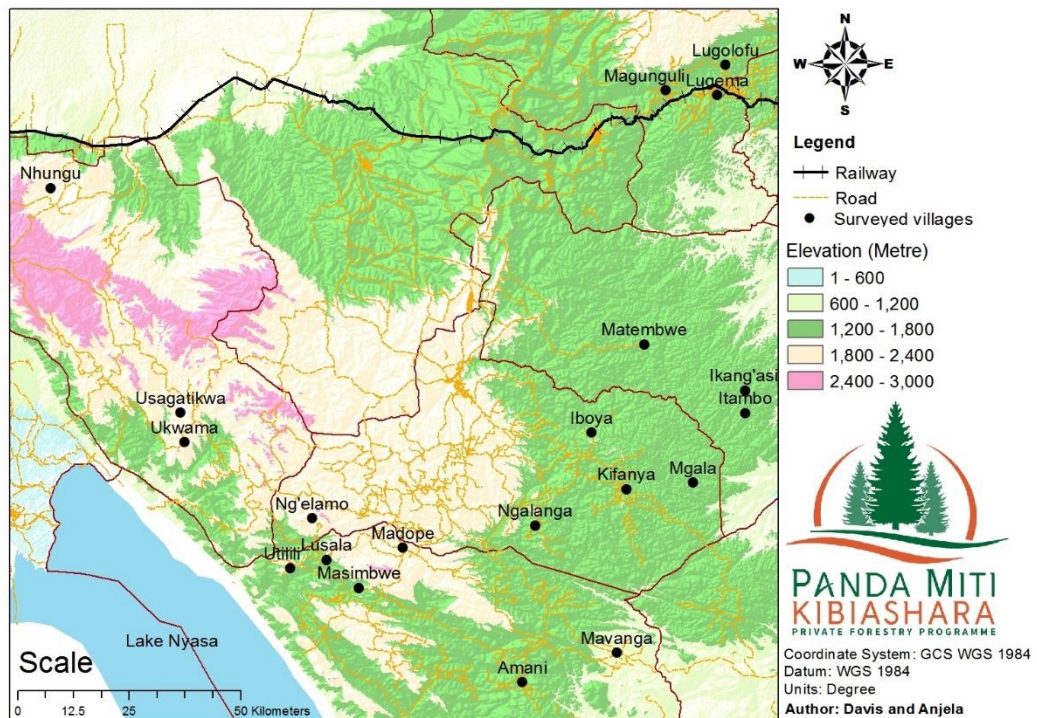
1.2. Objectives of the survey

- i. To assess the performance, survival, and level of management of the woodlots established through PFP support during the first two years of the programme.
- ii. To verify the status of the woodlots included in the PFP database.
- iii. To interview supported beneficiaries for collection of socioeconomic data.

2. LOCATION OF THE VILLAGE

Ng'elamo village is situated between latitude 9° 36' south and longitude 34° 28' east. The village is found in the southern highland areas of Njombe town council in Njombe region (Figure. 1). The elevation ranges between 1800m to 2000m a.s.l.

Figure 31: A map showing the location of Ng'elamo village with respect to other surveyed villages



3. METHODOLOGY

3.1. Field procedures

The field teams conducted the following activities while surveying the woodlots:

- ✚ Navigating to the woodlots using GPS receiver and support from local TGA personnel
- ✚ Then, a rope of radius of 7.57m was used to define the boundary of a sample plot within the woodlot
- ✚ Within the sample plots, the number of live and dead seedlings were counted (Annex 1).
- ✚ Also the level of weeding was assessed as shown in Table 1
- ✚ Metal bar was inserted for the 2015/16 established woodlots, so that they can be found later with a metal detector if needed.

Table 187 Classification for the level of weeding

Category/ Score	Title	Definition
0	No weeding done	There are practically no signs of weeding activities done during the past rainy season
1	Some weeding done, but not acceptably	There is clear evidence of weeding activities taken place during the past rainy season; however they have not been done sufficiently to ensure tree survival, good quality and good growth in the woodlot.
2	Weeding activities done acceptably	There are some shortcomings in the weeding activities, but the overall level is clearly sufficient to help ensure tree survival, good quality and good growth in the woodlot.
3	Weeding activities done completely	There are practically no signs of shortcomings, and all weeding activities appear to be conducted throughout the woodlot.

Key: The classification was reflected against the technical guidelines for circle and slash weeding as presented in the PFP TGIS guidelines. These require:

- Circle weeding: 50 cm radius to be cleared of weeds without damage to the tree in the middle.
- Slash weeding: all living weeds cut lower than 30 cm height.

It should be noted that no decisions of approval or disapproval for the level of weeding for support purposes were done in relation to this exercise.

3.2. Calculations and statistical analysis

- ✚ **Stand density (stems/ha):** the number of live trees plus number of dead trees in the sample plot, extended into a figure per hectare.
- ✚ **Survival percentage:** the share of live trees of the total number of trees in the sample plot.
- ✚ **Dominant height:** Average calculated from the two tallest tree heights measured in the sample plot. Assuming 3 x 3 m planting density, the figure represents the average height of the 100 tallest trees in a hectare.

3.3. Tools

- ✚ GPS receiver
- ✚ Smartphones installed with ODK collect tool
- ✚ PVC pipe and Rope of 7.57m radius
- ✚ Metal bar

4. RESULTS

4.1. Woodlots description

- ✚ A total of 57 woodlots owned by 37 beneficiaries surveyed (Table 2).
- ✚ The village surveyed woodlots comprised a total area of 141.37 acres supported by the programme through TGIS in kind (Table 2).

Table 188: Village total number and area of woodlots

Planting year/season	Beneficiaries	Number of woodlot	Total area (acres)
2014/15	Female	9	12.65
	Male	25	55.55
	Inst. &V.group	2	19.84
2015/16	Female	7	12.18
	Male	13	38.84
	Inst. &V.group	1	2.74
Grand Total		57	141.37

Key: Inst. &V.group = Institutions and vulnerable groups

4.2. Weeding

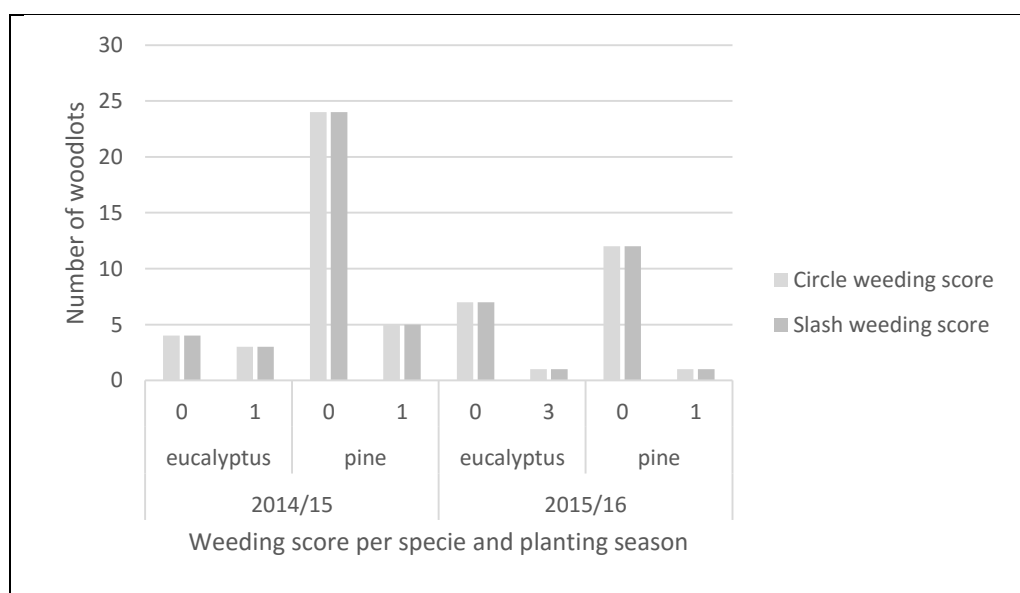
The observed score for both, circle and slash weeding were generally low (Table 3). The frequencies for assessed weeding scores are presented in Figure. 2.

Table 189 Mean circle weeding and slash weeding scores by specie group and year of stand establishment

Beneficiary	Specie group	Circle weeding		Slash weeding	
		2014/15	2015/16	2014/15	2015/16
Female	Pine	0.14	0.00	0.00	0.00
	Eucalyptus	0.50	1.00	0.00	0.00
Male	Eucalyptus	0.40	0.00	0.00	0.00
	Pine	0.20	0.13	0.00	0.00
Inst. &V.group	pine	0.00	0.00	0.00	0.00
Grand total		0.22	0.19	0.00	0.00

Key: Inst. &V.group = Institutions and vulnerable groups

Figure 32: Mean circle weeding and slash weeding scores by woodlots



4.3. Survival and stocking

4.3.1. Fire damage

Generally, at village level fire was not a major problem affecting survival of the tree seedling. Although, fire seems to be a major concern for the future development of the woodlots, hence mitigate measure are vital for sustainability of the woodlots.

4.3.2. Height growth

Ng'elamo village mean dominant height was good as observed in Table 5.

Table 190: Mean dominant height description

Specie group	hdom (metre)	
	2014/15	2015/16
Pines	1.30	0.45
Eucalyptus	0.67	0.35
Grand total	1.87	0.41

Key: hdom = Dominant height

4.3.3. Survival and stocking

Table 6 below shows the general survival percentage and mean stocking for Ng'elamo village. In general, the village average survival percentage was low, as compared to other villages (Table 7).

Table 191: Mean survival percentage description

Specie group	2014/15		2015/16	
	S-%	Stock (stem/ha)	S-%	Stock (stem/ha)
Pines	94%	1182	63%	1115
Eucalyptus	72%	1206	80%	1173
Grand total	90%	1187	70%	1137

Key: S-% = Survival percentage

Table 192: The rank of villages by average survival percentage

Village name	Average survival percentage	Rank
Matembwe	99%	1
Usagatikwa	95%	2
Kidabaga	95%	3
Lusala	90%	4
Kiyowela	89%	5
Ukwama	84%	6
Ngalanga	83%	7
Maguguli	83%	8
Madope	83%	9
Ng'elamo	82%	10
Kifanya	82%	11
Mavanga	82%	12
Ikang'asi	81%	13
Iboya	79%	14
Itambo	77%	15
Mgala	76%	16
Utilili	72%	17
Kiwalamo	72%	18
Lugema	70%	19
Lugolofu	69%	20
Amani	68%	21
Makungu	61%	22
Ukwega	59%	23
Masimbwe	54%	24
Nhungu	48%	25

4.4. Weeding

4.4.1. Circular weeding

Table 8 below shows the general circular weeding score for Ng'elamo village. In general, the village average circular weeding score was low as compared to other villages (Table 9).

Table 193: Mean circular weeding score description

Specie group	Circle weeding score	
	2014/15	2015/16
Pines	0.17	0.08
Eucalyptus	0.43	0.38
Grand total	0.22	0.19

Table 194: The rank of villages by average circular weeding score

Villages	Average circular weeding score	Rank
Usagatikwa	1.84	1
Matembwe	1.45	2
Lugema	1.39	3
Lugolofu	1.20	4
Kiyowela	1.10	5
Maguguli	1.04	6
Kiwalamo	0.96	7
Ukwega	0.83	8
Iboya	0.83	9
Mgala	0.82	10
Nhungu	0.76	11
Mavanga	0.76	12
Ukwama	0.63	13
Lusala	0.60	14
Makungu	0.52	15
Kifanya	0.44	16
Kidabaga	0.33	17
Itambo	0.32	18
Ikang'asi	0.27	19
Ng'elamo	0.21	20
Amani	0.15	21
Utilili	0.15	22
Ngalanga	0.06	23
Madope	0.01	24
Masimbwe	0.00	25

4.4.2. Slash weeding

Table 10 below shows the general slash weeding score for Ng'elamo village. In general, the village average slash weeding score was low as compared to other villages (Table 11).

Table 195: Mean slash weeding score description

Specie group	Slash weeding score	
	2014/15	2015/16
Pines	0.00	0.00
Eucalyptus	0.00	0.00
Grand total	0.00	0.00

Table 196: The rank of villages by average slash weeding score

Villages	Average slash weeding score	Rank
Kidabaga	2.00	1
Matembwe	1.73	2
Kiyowela	1.15	3
Mavanga	1.14	4
Lugema	1.11	5
Lusala	0.93	6
Maguguli	0.88	7
Kiwalamo	0.85	8
Ukwega	0.83	9
Makungu	0.76	10
Madope	0.66	11
Mgala	0.58	12
Usagatikwa	0.47	13
Kifanya	0.35	14
Lugolofu	0.35	15
Ukwama	0.34	16
Utilili	0.33	17
Ikang'asi	0.31	18
Itambo	0.30	19
Nhungu	0.27	20
Amani	0.26	21
Iboya	0.22	22
Ngalanga	0.11	23
Masimbwe	0.03	24
Ng'elamo	0.00	25

5. CONCLUSION AND RECOMMENDATION

Generally, the villagers are encouraged to increase effort in the woodlots management activities especially weeding, in order to obtain better survival, growth and quality of trees.

Results from the survey observed a slight correlation between the weeding and survival percentage of the woodlots in Ng'elamo village. As described in Table 12, both, slash and circular weeding showed a negative and positive linear relationship to number of dead and live seedling respectively. This indicate that, woodlots with high weeding scores observed to have high number of live seedlings with less dead seedling.

Table 197: A correlation between weeding and survival score

Variable	Dead seedlings	Live seedlings
WC	-0.18	0.16
WS	-0.02	0.08

Key: WC = Circle weeding score WS = Slash weeding score

To some extent this information evaluate the need for weeding to increase survival percentage of the seedling in the woodlots. If both slash and circular weeding are done perfectly, then one could reduce the number of dead seedling and increase/maintain the number of live seedling in a particular woodlot. Scientifically weeding is proven to be vital for the survival of tree seedlings, since it reduces competition over nutrients, air and light between tree seedlings and weeds.

6. RESULTS FOR EACH INDIVIDUAL WOODLOT

Table 13 below shows the results for each individual beneficiary woodlots. It includes:

- ✚ Weeding score: both circular and slash weeding score
- ✚ Stem density (stem/ha)
- ✚ Survival percentage

Table 198: Village woodlots results

sRank	Pyear	Name	Gender	Area (acres)	Specie	WC	WS	Live	Dead	Total	Stock (stem/ha)	S-%	Hdom (metre)
1	2014/15	PLASDO MWINUKA	Male	1.83	pine	0	0	27	0	27	1500	100%	1.2
2	2015/16	FRANCE MWINUKA	Male	1.53	pine	0	0	18	0	18	1000	100%	1.25
3	2014/15	DEUS MWINUKA	Male	1.28	pine	0	0	19	0	19	1055	100%	1.3
4	2014/15	SCOLA MLIGO	Female	0.79	pine	0	0	23	0	23	1278	100%	1.45
5	2014/15	ELIZA MLOWE	Female	1.85	eucalyptus	1	0	20	0	20	1111	100%	1.3
6	2014/15	ELIAS MLIGO	Male	1.85	eucalyptus	1	0	22	0	22	1222	100%	0.75
7	2014/15	NORBERT MWALONGO	Male	8.50	pine	1	0	24	0	24	1333	100%	1.55
8	2014/15	RICHARD MLELWA P	Male	1.16	pine	0	0	25	0	25	1389	100%	1.7
9	2014/15	SARAH MWALONGO	Female	1.98	pine	0	0	24	0	24	1333	100%	1.45
10	2014/15	S/M NG'ELAMO		7.12	pine	0	0	20	0	20	1111	100%	1.35
11	2014/15	SARAH MKONGA	Female	1.11	pine	1	0	21	0	21	1166	100%	1.35
12	2014/15	MAGNUS MTEGA	Male	1.68	pine	0	0	19	0	19	1055	100%	1.45
13	2014/15	JOSEPH JOHN	Male	5.68	pine	0	0	24	0	24	1333	100%	1.05
14	2014/15	MODESTA MWALONGO	Male	2.08	pine	0	0	24	0	24	1333	100%	1.35
15	2014/15	DAUD MLELWA	Male	1.26	pine	0	0	22	0	22	1222	100%	1.1
16	2014/15	MENRUFU K MLELWA	Male	0.79	pine	1	0	22	0	22	1222	100%	1.3
17	2014/15	PAULINUS MTEGA	Male	1.43	pine	0	0	23	1	24	1333	96%	1.45
18	2014/15	BLACIUS MDETE	Male	1.93	pine	0	0	21	1	22	1222	95%	1.35
19	2014/15	KASPAL MLIGO	Male	1.46	pine	0	0	21	1	22	1222	95%	1.4
20	2014/15	JOSEPH MWINUKA	Male	1.14	pine	0	0	20	1	21	1166	95%	1.25
21	2015/16	DOMITILA CHAULA	Female	1.68	eucalyptus	3	0	20	1	21	1166	95%	0.35
22	2014/15	SIKLADA MSEMWA	Female	1.71	pine	0	0	19	1	20	1111	95%	1.2
23	2014/15	SIKLADA MSEMWA	Male	1.75	pine	0	0	19	1	20	1111	95%	1.35
24	2015/16	DEUS MWINUKA	Male	2.17	pine	0	0	19	1	20	1111	95%	0.3
25	2014/15	MAGNUS MTEGA	Male	1.01	pine	1	0	19	1	20	1111	95%	1.5

sRank	Pyear	Name	Gender	Area (acres)	Specie	WC	WS	Live	Dead	Total	Stock (stem/ha)	S-%	Hdom (metre)
26	2014/15	VULNERABLE GROUP		12.73	pine	0	0	19	1	20	1111	95%	1.2
27	2014/15	LEOPORD MTEGA	Male	2.64	pine	0	0	18	1	19	1055	95%	1.1
28	2014/15	BARAKA MWALONGO	Male	1.61	pine	0	0	18	1	19	1055	95%	1.4
29	2014/15	VELEDIANA MWINUKA	Female	1.63	pine	0	0	22	2	24	1333	92%	1.25
30	2014/15	LUCIAN MTEGA	Male	2.03	pine	0	0	21	2	23	1278	91%	1.2
31	2015/16	BLASIUS MDETE	Male	1.33	eucalyptus	0	0	20	2	22	1222	91%	0.35
32	2015/16	VELEDIANA MWINUKA	Female	1.51	eucalyptus	0	0	19	2	21	1166	90%	0.3
33	2014/15	MENRUF MLELWA	Male	1.51	pine	1	0	19	2	21	1166	90%	1.3
34	2014/15	DOMINICK MLELWA	Female	1.24	pine	0	0	21	3	24	1333	88%	1.35
35	2015/16	BERHAD MWALONGO	Male	1.53	eucalyptus	0	0	21	3	24	1333	88%	0.35
36	2014/15	YOHANA MWALONGO	Male	1.93	eucalyptus	1	0	20	3	23	1278	87%	0.95
37	2015/16	CHARLES CHAULA	Male	7.93	pine	0	0	20	3	23	1278	87%	0.35
38	2015/16	CHARLES CHAULA	Male	3.04	eucalyptus	0	0	20	4	24	1333	83%	0.15
39	2015/16	SARAH MKONGA	Female	1.31	pine	0	0	21	5	26	1444	81%	0.5
40	2014/15	LEOPORD MTEGA	Male	6.77	eucalyptus	0	0	16	4	20	1111	80%	0.95
41	2015/16	BARAKA MWALONGO	Male	1.11	eucalyptus	0	0	16	4	20	1111	80%	0.3
42	2015/16	FRANCE MWINUKA	Male	2.82	pine	0	0	17	6	23	1278	74%	0.45
43	2014/15	VICTORINA MDETE	Female	1.31	pine	0	0	14	6	20	1111	70%	1.25
44	2015/16	ELIA MSIGWA	Male	2.89	pine	0	0	14	6	20	1111	70%	0.45
45	2015/16	SARA MWALONGO	Female	1.46	pine	0	0	13	6	19	1055	68%	0.35
46	2015/16	RUSTIKA MTITU	Female	1.66	eucalyptus	0	0	12	6	18	1000	67%	0.45
47	2014/15	JOSEPH JOHNE	Male	1.46	eucalyptus	0	0	16	8	24	1333	67%	0.45
48	2015/16	ZAKARIA MBILINYI	Male	2.22	pine	0	0	12	7	19	1055	63%	0.35
49	2015/16	FIDELIS CHENGULA	Male	2.77	pine	1	0	12	8	20	1111	60%	0.35
50	2015/16	YUSTINA NZIKU	Female	1.88	pine	0	0	8	8	16	889	50%	0.45

sRank	Pyear	Name	Gender	Area (acres)	Specie	WC	WS	Live	Dead	Total	Stock (stem/ha)	S-%	Hdom (metre)
51	2014/15	ZAKARIA MBILINYI	Male	0.00	pine	0	0	2	2	4	222	50%	0.45
52	2015/16	NG'ELAMO VILLAGE GOVERNMENT		2.74	pine	0	0	12	12	24	1333	50%	0.4
53	2015/16	RICHARD MLELWA	Male	1.66	eucalyptus	0	0	8	11	19	1055	42%	0.55
54	2014/15	VULNERABLE EUC	Male	2.77	eucalyptus	0	0	8	11	19	1055	42%	0.1
55	2014/15	GENOFEFA MLELWA	Female	1.04	eucalyptus	0	0	7	17	24	1333	29%	0.2
56	2015/16	LEOPORD MTEGA	Male	7.39	pine	0	0	3	8	11	611	27%	0.15
57	2015/16	SIKLADA MSEMWA	Female	2.69	pine	0	0	0	22	22	1222	0%	

Key:	sRank = Rank based on survival score	Pyear = Planting year
	Name = Woodlot owner first and last name	Area = Area of the woodlot in hectare
	Specie = tree type (name)	WC = Circle weeding
	WS = Slash weeding	Live = Alive seedling
	Dead = Dead seedling	Total = Sum of seedling both dead and alive
	Stock = Total number of seedling per hectare	s-% = Survival percentage
	Sdeath = Score for dead seedling	hdom = Average height of two dominant (tallest) tree

Annex 1

7. WOODLOT ASSESSMENT FIELD SURVEY FORM

Surveyors: _____ Date: _____

WOODLOT LOCATION & OWNERSHIP

8. Coordinates by GPS

9. GPS accuracy

--

10. Village: _____ District: _____

11. Woodlot owner Name, Phone number and ID number (if applicable):

12. Has the woodlot changed owner since establishment? No / Yes / Unknown

If Yes, fill in the original owner: _____

PLOT MEASUREMENTS

13. Number of trees alive in the plot

--

14. Number of trees dead in the plot

--

15. Total number of trees in the plot

--

16. Height of the plot tallest tree (in decimetres): _____ dm, Second tallest tree: _____ dm

17. In case there are dead trees, assess the likely main cause of death:

Suppression by weeds <input type="checkbox"/>	Cattle trampling: <input type="checkbox"/>
Fire damage <input type="checkbox"/>	Drought stress: <input type="checkbox"/>
Disease <input type="checkbox"/>	Other: <input type="checkbox"/>
Insect damage <input type="checkbox"/>	(specify "Other" in remarks)

GENERAL WOODLOT DATA

18. Species group: Pine / Eucalyptus
 / Teak

19. Level of circle weeding in the woodlot:

20. Level of slash weeding in the woodlot:

Scale: 0 – No weeding done
 1 – Some weeding done, but not acceptably
 2 – Weeding activities done acceptably
 3 – Weeding activities done completely

ADDITIONAL REMARKS BY SURVEYORS

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End of Dry Season woodlot assessment 2016/17

End of Dry season survey feedback report for Nhungu village

June 2016, Iringa, Tanzania



United Republic of Tanzania
**MINISTRY OF NATURAL RESOURCES
AND TOURISM**
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**EMBASSY OF FINLAND
DAR ES SALAAM**

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LIST OF ANNEXES

Annex 1: Woodlot assessment field survey form

ABBREVIATIONS

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PFP Private Forestry Programme
TGIS Tree Growing Incentive Scheme

1. INTRODUCTION

1.1. Background

The Private Forestry Programme (PFP) is a Finnish funded development aid programme designed to run from 2014 to 2030. It increases wealth in the Southern Highlands by promoting commercial management of smallholder plantations and wood processing enterprises.

This field survey was carried out in 25 villages that have been supported in planting trees by PFP. The field work was done from December 2016 to February 2017. The purpose of the field work was to assess the performance and management of the woodlots. The results will be used by PFP to improve its support models in the future.

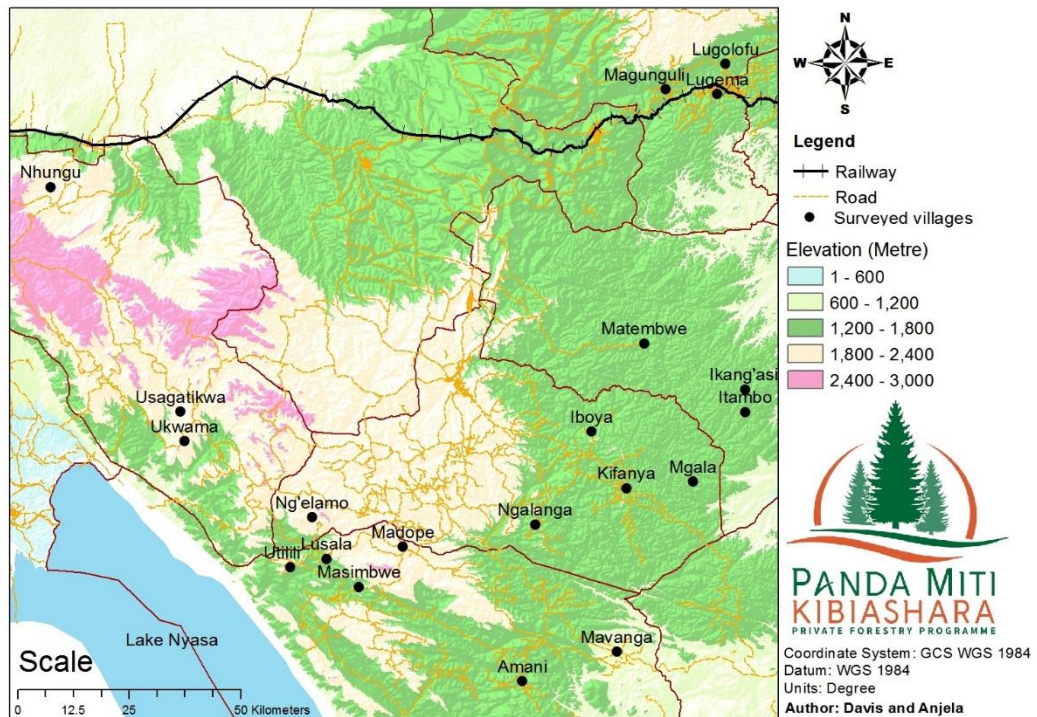
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- i. To assess the performance, survival, and level of management of the woodlots established through PFP support during the first two years of the programme.
- ii. To verify the status of the woodlots included in the PFP database.
- iii. To interview supported beneficiaries for collection of socioeconomic data.

2. LOCATION OF THE VILLAGE

Nhungu village is situated between latitude $8^{\circ} 56'$ south and longitude $33^{\circ} 56'$ east. The village is found in the north western highland areas of Makete district in Njombe region (Figure. 1). The elevation ranges between 1600m to 2200m a.s.l. and the soil texture is clay loamy and sand loamy soils in the valley bottom areas.

Figure 33: A map showing the location of Nhungu village with respect to other surveyed villages



3. METHODOLOGY

3.1. Field procedures

The field teams conducted the following activities while surveying the woodlots:

- ✚ Navigating to the woodlots using GPS receiver and support from local TGA personnel
- ✚ Then, a rope of radius of 7.57m was used to define the boundary of a sample plot within the woodlot
- ✚ Within the sample plots, the number of live and dead seedlings were counted (Annex 1).
- ✚ Also the level of weeding was assessed as shown in Table 1
- ✚ Metal bar was inserted for the 2015/16 established woodlots, so that they can be found later with a metal detector if needed

Table 199 Classification for the level of weeding

Category/ Score	Title	Definition
0	No weeding done	There are practically no signs of weeding activities done during the past rainy season
1	Some weeding done, but not acceptably	There is clear evidence of weeding activities taken place during the past rainy season; however they have not been done sufficiently to ensure tree survival, good quality and good growth in the woodlot.
2	Weeding activities done acceptably	There are some shortcomings in the weeding activities, but the overall level is clearly sufficient to help ensure tree survival, good quality and good growth in the woodlot.
3	Weeding activities done completely	There are practically no signs of shortcomings, and all weeding activities appear to be conducted throughout the woodlot.

Key: The classification was reflected against the technical guidelines for circle and slash weeding as presented in the PFP TGIS guidelines. These require:

- Circle weeding: 50 cm radius to be cleared of weeds without damage to the tree in the middle.
- Slash weeding: all living weeds cut lower than 30 cm height.

It should be noted that no decisions of approval or disapproval for the level of weeding for support purposes were done in relation to this exercise.

3.2. Calculations and statistical analysis

- ✚ **Stand density (stems/ha):** the number of live trees plus number of dead trees in the sample plot, extended into a figure per hectare.
- ✚ **Survival percentage:** the share of live trees of the total number of trees in the sample plot.
- ✚ **Dominant height:** Average calculated from the two tallest tree heights measured in the sample plot. Assuming 3 x 3 m planting density, the figure represents the average height of the 100 tallest trees in a hectare.

3.3. Tools

- ✚ GPS receiver
- ✚ Smartphones installed with ODK collect tool
- ✚ PVC pipe and Rope of 7.57m radius
- ✚ Metal bar

4. RESULTS

4.1. Woodlots description

- ✚ A total of 84 woodlots owned by 70 beneficiaries surveyed (Table 2).
- ✚ The village surveyed woodlots comprised a total area of 244.81 acres supported by the programme through TGIS in kind (Table 2).

Table 200: Village total number and area of woodlots

Planting year/season	Beneficiaries	Number of woodlot	Total area (acres)
2015/16	Female	4	6.55
	Male	75	202.45
	Inst. & V.group	5	35.81
Grand Total		84	244.81

Key: Inst. & V.group = Institutions and vulnerable groups

4.2. Weeding

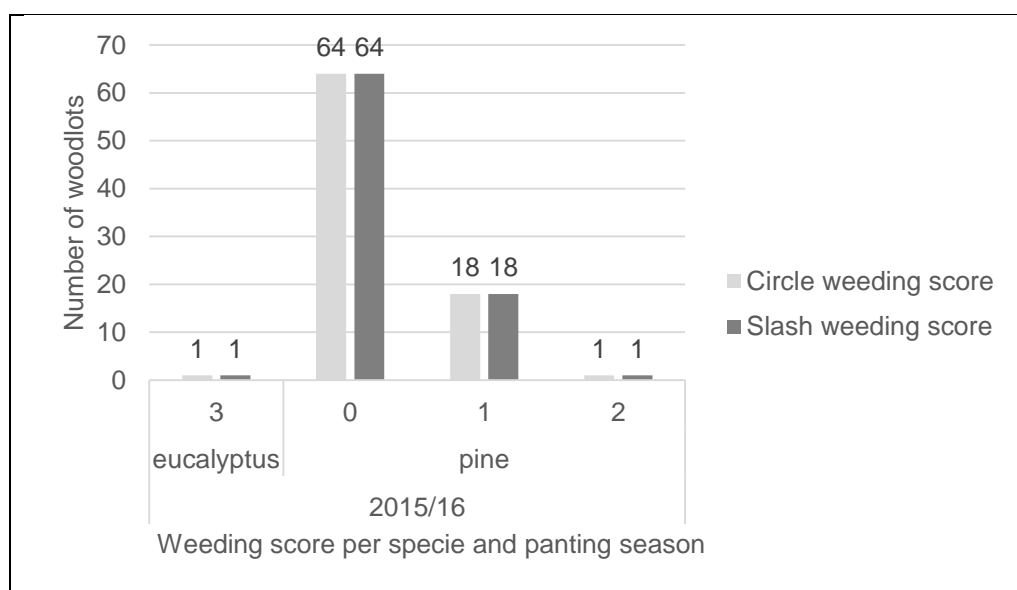
The observed score for both, circle and slash weeding were generally low (Table 3). The frequencies for assessed weeding scores are presented in Figure. 2.

Table 201 Mean circle weeding and slash weeding scores by species group and year of stand establishment

Planting year/season	Beneficiaries	Specie group	CW	SW
2015/16	Female	Pine	1.25	0.25
	Male		0.76	0.25
	Inst. & V.group	Eucalyptus	0.00	3.00
		Pine	0.50	0.00
Grand Total			0.76	0.27

Key: CW = Circular weeding SW = Slash weeding

Figure 34: Mean circle weeding and slash weeding scores by woodlots



4.3. Survival and stocking

4.3.1. Fire damage

Generally, at village level fire was not a major problem affecting survival of the tree seedling. Although, fire seems to be a major concern for the future development of the woodlots, hence mitigate measure are vital for sustainability of the woodlots.

4.3.2. Height growth

Nhungu village mean dominant height was good as observed in Table 4.

Table 202: Mean dominant height description

Species group	2015/16	
	Hdom (metre)	
Eucalyptus	0.60	
Pine	0.325	
Grand total	0.326	

Key: hdom = Dominant height

4.3.3. Survival and stocking

Table 5 below shows the general survival percentage and mean stocking of Nhungu village. In general, the village average survival percentage was low, as compared to other villages (Table 6).

Table 203: Mean survival percentage description

Species group	2015/16	
	S-%	Stocking (stem/ha)
Pines	47%	1051
Eucalyptus	100%	444
Grand total	48%	1044

Table 204: The rank of villages by average survival percentage

Village name	Average survival percentage	Rank
Matembwe	99%	1
Usagatikwa	95%	2
Kidabaga	95%	3
Lusala	90%	4
Kiyowela	89%	5
Ukwama	84%	6
Ngalanga	83%	7
Maguguli	83%	8
Madope	83%	9
Ng'elamo	82%	10
Kifanya	82%	11
Mavanga	82%	12
Ikang'asi	81%	13
Iboya	79%	14
Itambo	77%	15
Mgala	76%	16
Utilili	72%	17
Kiwalamo	72%	18
Lugema	70%	19
Lugolofu	69%	20
Amani	68%	21
Makungu	61%	22
Ukwega	59%	23
Masimbwe	54%	24
Nhungu	48%	25

4.4. Weeding

4.4.1. Circular weeding

Table 7 below shows the general circular weeding score for Nhungu village. In general, the village average circular weeding score was low as compared to other villages (Table 8).

Table 205: Mean circular weeding score description

Specie group	WC
	2015/16
Pines	0.76
Eucalyptus	0.00
Grand total	0.76

Key: WC = Circular weeding scores,

Table 206: The rank of villages by average circular weeding score

Villages	Average circular weeding score	Rank
Usagatikwa	1.84	1
Matembwe	1.45	2
Lugema	1.39	3
Lugolofu	1.20	4
Kiyowela	1.10	5
Maguguli	1.04	6
Kiwalamo	0.96	7
Ukwega	0.83	8
Iboya	0.83	9
Mgala	0.82	10
Nhungu	0.76	11
Mavanga	0.76	12
Ukwama	0.63	13
Lusala	0.60	14
Makungu	0.52	15
Kifanya	0.44	16
Kidabaga	0.33	17
Itambo	0.32	18
Ikang'asi	0.27	19
Ng'elamo	0.21	20
Amani	0.15	21
Utilili	0.15	22
Ngalanga	0.06	23
Madope	0.01	24
Masimbwe	0.00	25

4.4.2. Slash weeding

Table 9 below shows the general slash weeding score for Nhungu village. In general, the village average slash weeding score was low as compared to other villages (Table 10).

Table 207: Mean slash weeding score description

Specie group	WS
	2015/16
Pines	0.24
Eucalyptus	3.00
Grand total	0.27

Key: WS = Slash weeding score

Table 208: The rank of villages by average slash weeding score

Villages	Average slash weeding score	Rank
Kidabaga	2.00	1
Matembwe	1.73	2
Kiyowela	1.15	3
Mavanga	1.14	4
Lugema	1.11	5
Lusala	0.93	6
Maguguli	0.88	7
Kiwalamo	0.85	8
Ukwega	0.83	9
Makungu	0.76	10
Madope	0.66	11
Mgala	0.58	12
Usagatikwa	0.47	13
Kifanya	0.35	14
Lugolofu	0.35	15
Ukwama	0.34	16
Utilili	0.33	17
Ikang'asi	0.31	18
Itambo	0.30	19
Nhungu	0.27	20
Amani	0.26	21
Iboya	0.22	22
Ngalanga	0.11	23
Masimbwe	0.03	24
Ng'elamo	0.00	25

5. CONCLUSION AND RECOMMENDATION

Generally, the villagers are encouraged to increase effort in the woodlots management activities especially weeding, in order to obtain better survival, growth and quality of trees.

Results from the survey observed a slight correlation between the weeding and survival percentage of the woodlots in Nhungu village. As described in Table 11, slash weeding showed a negative and positive linear relationship to number of dead and live seedling respectively. On the other hand, Circle weeding shown positive linear correlations with both live and dead seedlings. For slash weeding, this indicate that, woodlots with high weeding scores observed to have high number of live seedlings with less dead seedling. But for circle weeding, the results indicate that for some areas circle weeding contribute in death of seedling and in other areas it is positively maintain number of live seedlings.

Table 209: A correlation between weeding and survival score

Variable	Dead seedlings	Live seedlings
WC	0.045	0.18
WS	-0.23	0.24

Key: WC = Circle weeding score WS = Slash weeding score

To some extent this information evaluate the need for weeding to increase survival percentage of the seedling in the woodlots. If both slash and circular weeding are done perfectly, then one could reduce the number of dead seedling and increase/maintain the number of live seedling in a particular woodlot. Scientifically weeding is proven to be vital for the survival of tree seedlings, since it reduces competition over nutrients, air and light between tree seedlings and weeds.

Further investigation on the impact of circle weeding is required for the sustainability of the woodlots.

6. RESULTS FOR EACH INDIVIDUAL WOODLOT

Table 12 below shows the results for each individual beneficiary woodlots. It includes:

- ✚ Weeding score: both circular and slash weeding score
- ✚ Stem density (stem/ha)
- ✚ Survival percentage

Table 210: Village woodlots results

sRank	Pyear	Name	Gender	Area (acres)	Specie	WC	WS	Live	Dead	Total	Stock (stem/ha)	S-%	Hdom (metre)
1	2015/16	ADRIANO NGUVILA	Male	15.47	pine	0	0	13	0	13	722	100%	0.45
2	2015/16	VULNERABLE GROUP		20.19	eucalyptus	0	3	8	0	8	444	100%	0.6
3	2015/16	ANDONGOLILE JOVA	Male	5.54	pine	0	0	13	0	13	722	100%	0.2
4	2015/16	ANDONDILE SANGA	Male	2.32	pine	0	0	23	1	24	1333	96%	0.25
5	2015/16	NASHUKURU CHENERO	Male	2.37	pine	0	0	18	2	20	1111	90%	0.25
6	2015/16	BAKARI SEMBE	Male	3.16	pine	0	0	17	3	20	1111	85%	0.25
7	2015/16	CHESCO MBWANJI	Male	2.77	pine	1	0	16	3	19	1055	84%	0.2
8	2015/16	TAFAKARI CHAULA	Male	2.50	pine	2	1	17	4	21	1166	81%	0.35
9	2015/16	NURDIN NGOGO	Male	4.13	pine	1	0	17	4	21	1166	81%	0.35
10	2015/16	ESTAMELI MBWANJI	Male	2.03	pine	1	1	17	4	21	1166	81%	0.25
11	2015/16	PASTA MBWANJI	Male	0.91	pine	2	1	17	4	21	1166	81%	0.25
12	2015/16	ELLY MBENA	Male	6.10	pine	1	0	16	4	20	1111	80%	0.4
13	2015/16	PASTA MBWANJI	Male	1.41	pine	2	1	15	4	19	1055	79%	0.35
14	2015/16	IBRAHIM SOVELA	Male	3.63	pine	1	0	17	5	22	1222	77%	0.45
15	2015/16	ANOLD NGOGO	Male	3.68	pine	1	0	16	5	21	1166	76%	0.4
16	2015/16	DANFORD NGUVILA	Male	2.35	pine	1	1	16	5	21	1166	76%	0.45
17	2015/16	ZEBRON NKINDA	Male	0.49	pine	1	0	16	5	21	1166	76%	0.5
18	2015/16	NAFTALI NGUVILA	Male	3.51	pine	1	0	13	5	18	1000	72%	0.4
19	2015/16	EDINA NGUVILA	Female	1.73	pine	1	0	15	6	21	1166	71%	0.45
20	2015/16	NIKOLAS MBWANJI	Male	2.50	pine	0	0	15	6	21	1166	71%	0.3
21	2015/16	LUGANO KAZIMBAYA	Male	1.21	pine	1	0	15	6	21	1166	71%	0.25
22	2015/16	AGREY NGUVILA	Male	6.30	pine	1	0	13	6	19	1055	68%	0.35
23	2015/16	RASHIDI NGUVILA	Male	3.43	pine	1	1	14	7	21	1166	67%	0.25
24	2015/16	MAHEMA MSEMWA	Male	1.98	pine	1	1	12	7	19	1055	63%	0.25
25	2015/16	LUSUNGU MBWANJI	Male	0.17	pine	1	1	13	8	21	1166	62%	0.25

sRank	Pyear	Name	Gender	Area (acres)	Specie	WC	WS	Live	Dead	Total	Stock (stem/ha)	S-%	Hdom (metre)
26	2015/16	JAILOS NSEMWA	Male	1.53	pine	1	1	13	8	21	1166	62%	0.25
27	2015/16	ONESMO NSEMWA	Male	1.33	pine	1	1	13	8	21	1166	62%	0.25
28	2015/16	YOHANIS NGUVILA	Male	2.57	pine	2	2	13	9	22	1222	59%	0.45
29	2015/16	GODFREY NGOGO P2	Male	1.53	pine	1	0	10	7	17	944	59%	0.45
30	2015/16	JULIUS NGUVILA	Male	2.79	pine	0	0	11	8	19	1055	58%	0.6
31	2015/16	KODI NGOGO	Male	0.94	pine	1	0	12	9	21	1166	57%	0.55
32	2015/16	ANDERSON NGUVILA	Male	2.15	pine	2	1	11	9	20	1111	55%	0.25
33	2015/16	RAPHAEL NGUVILA	Male	4.32	pine	1	0	12	10	22	1222	55%	0.55
34	2015/16	BELEKIA NGUVILA	Male	0.94	pine	1	1	12	10	22	1222	55%	0.25
35	2015/16	KOLINELI MBWANJI	Male	0.77	pine	0	0	8	7	15	833	53%	0.35
36	2015/16	BAHATI MSEMWA	Male	4.15	pine	1	0	10	11	21	1166	48%	0.35
37	2015/16	DISLAUS NGOGO	Male	0.57	pine	1	0	10	11	21	1166	48%	0.35
38	2015/16	ESSAU NDAGA	Male	1.71	pine	1	1	10	11	21	1166	48%	0.25
39	2015/16	VUMILIA NG'ONDYA	Female	1.31	pine	1	1	10	11	21	1166	48%	0.25
40	2015/16	SHUKRANI MWAULES P2	Male	2.64	pine	0	0	5	6	11	611	45%	0.25
41	2015/16	ISAYA NSEMWA	Male	2.87	pine	0	0	10	12	22	1222	45%	0.45
42	2015/16	ELIUDY TULIANI	Male	1.21	pine	1	0	5	6	11	611	45%	0.4
43	2015/16	ADILI NGUVILA	Male	2.92	pine	0	0	9	11	20	1111	45%	0.35
44	2015/16	TULAWONA JOVA	Male	2.50	pine	1	0	9	11	20	1111	45%	0.15
45	2015/16	KKKT NHUNGU		5.81	pine	0	0	8	10	18	1000	44%	0.35
46	2015/16	AYUBU CHENELO	Male	4.40	pine	0	0	7	9	16	889	44%	0.25
47	2015/16	NAFTALI MBWLO	Male	0.94	pine	1	0	8	12	20	1111	40%	0.15
48	2015/16	GODBLE'S LYAMBINGU	Male	1.63	pine	1	0	6	9	15	833	40%	0.4
49	2015/16	KOLINELI MBWANJI P2	Male	1.61	pine	1	1	8	13	21	1166	38%	0.25
50	2015/16	JUMA NSEMWA	Male	3.16	pine	1	0	8	13	21	1166	38%	0.4
51	2015/16	GODFREY NGOGO	Male	7.83	pine	0	0	6	10	16	889	38%	0.25

sRank	Pyear	Name	Gender	Area (acres)	Specie	WC	WS	Live	Dead	Total	Stock (stem/ha)	S-%	Hdom (metre)
52	2015/16	LUPUMUKO MBWANJI	Male	2.57	pine	1	0	6	10	16	889	38%	0.35
53	2015/16	JOJI CHENELO	Male	0.82	pine	1	0	6	10	16	889	38%	0.35
54	2015/16	SAMAHANI NGUVILA	Male	3.90	pine	1	0	6	10	16	889	38%	0.35
55	2015/16	TUSEI NGUVILA	Male	1.58	pine	1	0	7	13	20	1111	35%	0.4
56	2015/16	EDSON NSELU	Male	1.36	pine	0	0	7	13	20	1111	35%	0.45
57	2015/16	PISONI NSEMWA	Male	2.25	pine	1	1	7	13	20	1111	35%	0.25
58	2015/16	DANFORD NGUVILA	Male	3.26	pine	0	0	7	14	21	1166	33%	0.25
59	2015/16	TANAELI MBWANJI	Male	2.22	pine	1	0	5	10	15	833	33%	0.35
60	2015/16	METHOD MICHAEL	Male	1.73	pine	0	0	7	14	21	1166	33%	0.45
61	2015/16	SHULE YA MSINGI NHUNGU		4.45	pine	1	0	6	12	18	1000	33%	0.25
62	2015/16	SHUKRANI MWAULISI	Male	6.05	pine	1	0	6	13	19	1055	32%	0.3
63	2015/16	DISLAUSI NGOGO	Male	1.48	pine	1	0	6	13	19	1055	32%	0.35
64	2015/16	EDSON MBWANJI	Male	1.43	pine	1	0	5	11	16	889	31%	0.45
65	2015/16	RICHARD KIVIVI	Male	1.75	pine	1	1	6	14	20	1111	30%	0.25
66	2015/16	TOMBWEN NSEMWA	Male	1.75	pine	1	0	6	14	20	1111	30%	0.25
67	2015/16	SIJALI NKINDA	Male	3.39	pine	1	0	7	18	25	1389	28%	0.2
68	2015/16	ATWOMOLILE NSEMWA	Male	1.01	pine	1	0	5	13	18	1000	28%	0.25
69	2015/16	SHUKRANI MWAULESI P3	Male	4.05	pine	0	0	5	15	20	1111	25%	0.15
70	2015/16	FANUELI NG'ONDYA	Male	4.27	pine	0	0	5	16	21	1166	24%	0.25
71	2015/16	ISSA MBWANJI	Male	1.16	pine	1	1	5	16	21	1166	24%	0.25
72	2015/16	ZEITUNI NG'ONDYA	Female	2.69	pine	1	0	5	16	21	1166	24%	0.25
73	2015/16	MENATI MALEKANO	Male	7.66	pine	1	0	4	16	20	1111	20%	0.25
74	2015/16	MOSES MWANG'OMBE	Male	0.00	pine	0	0	3	16	19	1055	16%	0.25
75	2015/16	CHRIFOD MWAULES	Male	6.05	pine	1	0	3	17	20	1111	15%	0.25
76	2015/16	JAKSON MBWANJI	Male	0.64	pine	0	0	2	14	16	889	13%	0.35
77	2015/16	CLEVER NGOGO	Male	1.14	pine	0	0	2	16	18	1000	11%	0.35

sRank	Pyear	Name	Gender	Area (acres)	Specie	WC	WS	Live	Dead	Total	Stock (stem/ha)	S-%	Hdom (metre)
78	2015/16	ATOMOLILE CHENELO	Male	1.16	pine	0	0	1	13	14	778	7%	0.3
79	2015/16	FORD MBWANJI	Male	2.13	pine	2	0	1	16	17	944	6%	0.4
80	2015/16	AMASHA NGUVILA	Male	2.45	pine	1	0	0	20	20	1111	0%	
81	2015/16	MICHAEL MBWANJI	Male	0.96	pine	0	0	0	10	10	555	0%	
82	2015/16	EAGT NHUNGU		1.85	pine	0	0	0	13	13	722	0%	
83	2015/16	ANDAMLILE MBWANJI	Male	2.74	pine	0	0	0	9	9	500	0%	
84	2015/16	ROZI NKINDA	Female	0.82	pine	2	0	0	19	19	1055	0%	0.3

Key:	sRank	=	Rank based on survival score	Pyear	=	Planting year	
	Name	=	Woodlot owner first and last name		Area	=	Area of the woodlot in hectare
	Specie	=	tree type (name)		WC	=	Circle weeding
	WS	=	Slash weeding		Live	=	Alive seedling
	Dead	=	Dead seedling		Total	=	Sum of seedling both dead and alive
	Stock	=	Total number of seedling per hectare		s-%	=	Survival percentage
	Sdeath	=	Score for dead seedling		hdom	=	Average height of two dominant (tallest) tree

Annex 1

7. WOODLOT ASSESSMENT FIELD SURVEY FORM

Surveyors: _____ Date: _____

WOODLOT LOCATION & OWNERSHIP

8. Coordinates by GPS

9. GPS accuracy

--

10. Village: _____ District: _____

11. Woodlot owner Name, Phone number and ID number (if applicable):

12. Has the woodlot changed owner since establishment? No / Yes / Unknown

If Yes, fill in the original owner: _____

PLOT MEASUREMENTS

13. Number of trees alive in the plot

--

14. Number of trees dead in the plot

--

15. Total number of trees in the plot

--

16. Height of the plot tallest tree (in decimetres): _____ dm, Second tallest tree: _____ dm

17. In case there are dead trees, assess the likely main cause of death:

Suppression by weeds	<input type="checkbox"/>	Cattle trampling:	<input type="checkbox"/>
Fire damage	<input type="checkbox"/>	Drought stress:	<input type="checkbox"/>
Disease	<input type="checkbox"/>	Other:	<input type="checkbox"/>
Insect damage	<input type="checkbox"/>	(specify "Other" in remarks)	

GENERAL WOODLOT DATA

18. Species group: Pine / Eucalyptus
 / Teak

19. Level of circle weeding in the woodlot:

20. Level of slash weeding in the woodlot:

Scale: 0 – No weeding done
 1 – Some weeding done, but not acceptably
 2 – Weeding activities done acceptably
 3 – Weeding activities done completely

ADDITIONAL REMARKS BY SURVEYORS

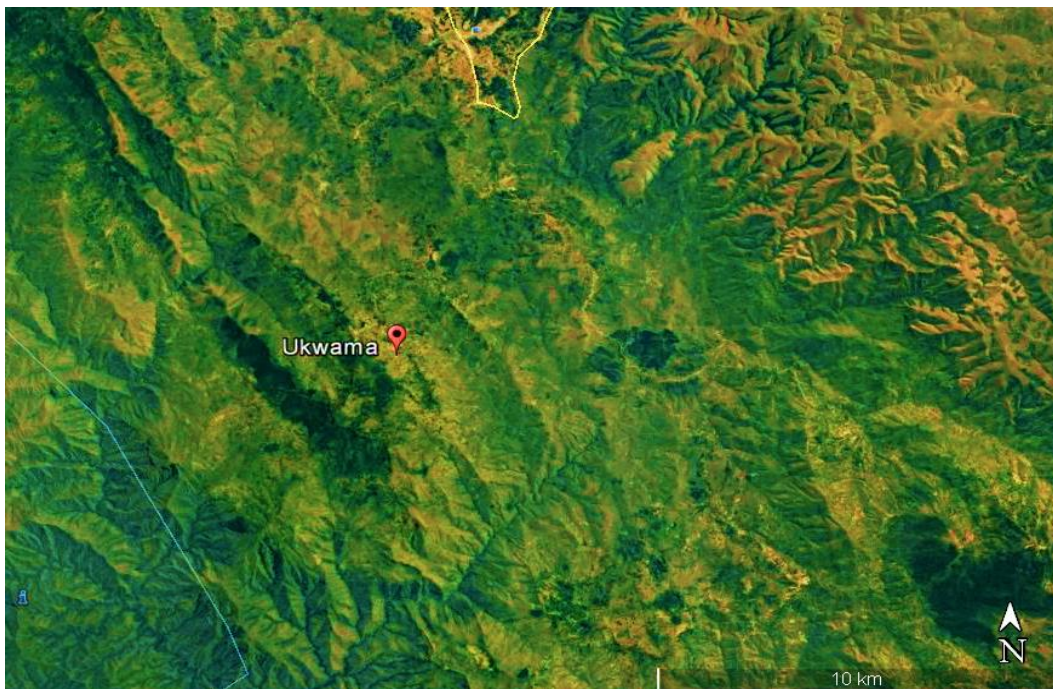
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End of Dry Season woodlot assessment 2016/17

End of Dry season survey feedback report for Ukwama village

June 2017, Iringa, Tanzania



United Republic of Tanzania
**MINISTRY OF NATURAL RESOURCES
AND TOURISM**
Forestry and Beekeeping Division



**EMBASSY OF FINLAND
DAR ES SALAAM**

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LIST OF ANNEXES

Annex 1: Woodlot assessment field survey form

ABBREVIATIONS

GPS Global Positioning System
PFP Private Forestry Programme
TGIS Tree Growing Incentive Scheme

1. INTRODUCTION

1.1. Background

The Private Forestry Programme (PFP) is a Finnish funded development aid programme designed to run from 2014 to 2030. It increases wealth in the Southern Highlands by promoting commercial management of smallholder plantations and wood processing enterprises.

This field survey was carried out in 25 villages that have been supported in planting trees by PFP. The field work was done from December 2016 to February 2017. The purpose of the field work was to assess the performance and management of the woodlots. The results will be used by PFP to improve its support models in the future.

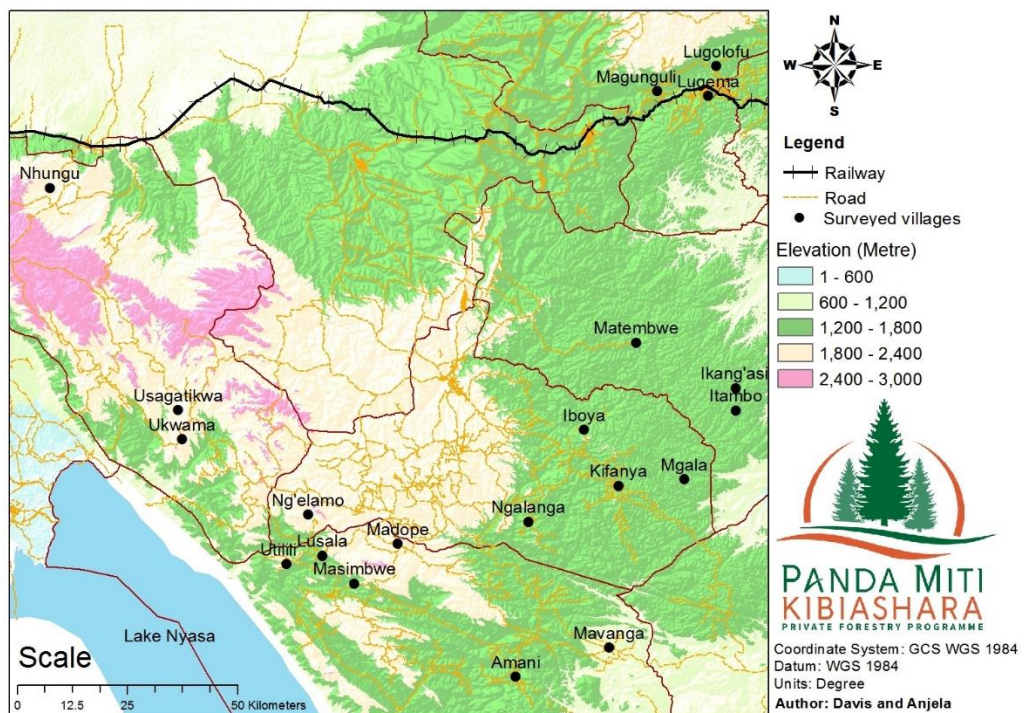
1.2. Objectives of the survey

- i. To assess the performance, survival, and level of management of the woodlots established through PFP support during the first two years of the programme.
- ii. To verify the status of the woodlots included in the PFP database.
- iii. To interview supported beneficiaries for collection of socioeconomic data.

2. LOCATION OF THE VILLAGE

Ukwama village is situated between latitude 9° 27' south and longitude 34° 12' east. The village is found in the south eastern highland areas of Makete district in Njombe region and it is characterised as wet intermediate agro ecological zone (Figure. 1). The elevation ranges between 1200m to 2460m a.s.l. and the soil texture is clay silt and alluvial soils in the valley bottom areas.

Figure 35: A map showing the location of Ukwama village with respect to other surveyed villages



3. METHODOLOGY

3.1. Field procedures

The field teams conducted the following activities while surveying the woodlots:

- ✚ Navigating to the woodlots using GPS receiver and support from local TGA personnel
- ✚ Then, a rope of radius of 7.57m was used to define the boundary of a sample plot within the woodlot
- ✚ Within the sample plots, the number of live and dead seedlings were counted (Annex 1).
- ✚ Also the level of weeding was assessed as shown in Table 1
- ✚ Metal bar was inserted for the 2015/16 established woodlots, so that they can be found later with a metal detector if needed.

Table 211 Classification for the level of weeding

Category/ Score	Title	Definition
0	No weeding done	There are practically no signs of weeding activities done during the past rainy season
1	Some weeding done, but not acceptably	There is clear evidence of weeding activities taken place during the past rainy season; however they have not been done sufficiently to ensure tree survival, good quality and good growth in the woodlot.
2	Weeding activities done acceptably	There are some shortcomings in the weeding activities, but the overall level is clearly sufficient to help ensure tree survival, good quality and good growth in the woodlot.
3	Weeding activities done completely	There are practically no signs of shortcomings, and all weeding activities appear to be conducted throughout the woodlot.

Key: The classification was reflected against the technical guidelines for circle and slash weeding as presented in the PFP TGIS guidelines. These require:

- Circle weeding: 50 cm radius to be cleared of weeds without damage to the tree in the middle.
- Slash weeding: all living weeds cut lower than 30 cm height.

It should be noted that no decisions of approval or disapproval for the level of weeding for support purposes were done in relation to this exercise.

3.2. Calculations and statistical analysis

- ✚ **Stand density (stems/ha):** the number of live trees plus number of dead trees in the sample plot, extended into a figure per hectare.
- ✚ **Survival percentage:** the share of live trees of the total number of trees in the sample plot.
- ✚ **Dominant height:** Average calculated from the two tallest tree heights measured in the sample plot. Assuming 3 x 3 m planting density, the figure represents the average height of the 100 tallest trees in a hectare.

3.3. Tools

- ✚ GPS receiver
- ✚ Smartphones installed with ODK collect tool
- ✚ PVC pipe and Rope of 7.57m radius
- ✚ Metal bar

4. RESULTS

4.1. Woodlots description

- ✚ A total of 166 woodlots owned by 159 beneficiaries surveyed (Table 2).
- ✚ The village surveyed woodlots comprised a total area of 232.02 acres supported by the programme through TGIS in kind (Table 2).

Table 212: Village total number and area of woodlots

Planting year/season	Beneficiaries	Number of woodlot	Total area (acres)
2015/16	Female	33	46.23
	Male	132	184.88
	Institution	1	0.91
Grand Total		166	232.02

4.2. Weeding

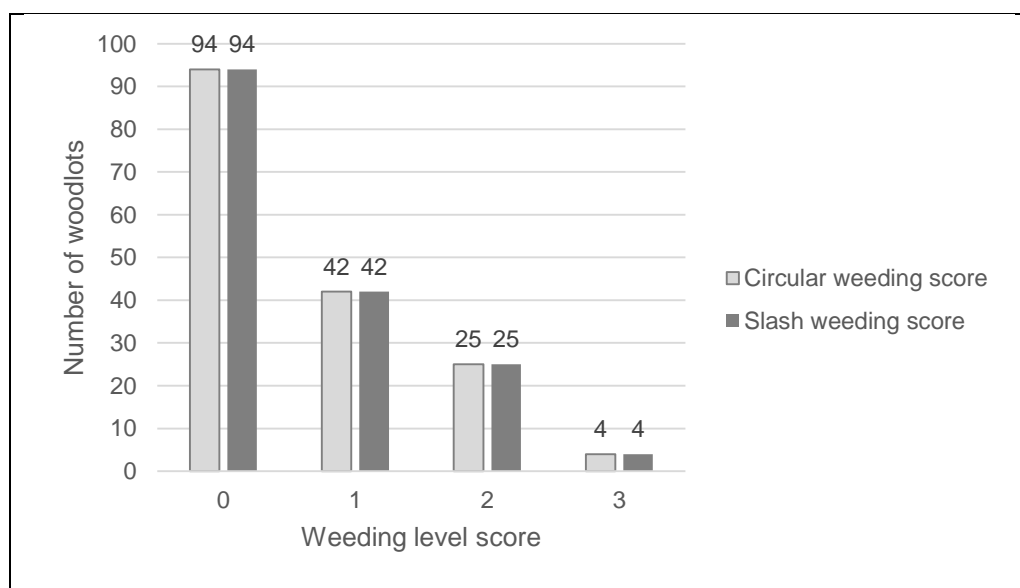
The observed score for both, circle and slash weeding were generally low (Table 3). The frequencies for assessed weeding scores are presented in Figure. 2.

Table 213 Mean circle weeding and slash weeding scores by species group and year of stand establishment

Planting year/season	Beneficiaries	Specie group	CW	SW
2015/16	Female	Pine	0.67	0.52
	Male		0.62	0.31
	Institution		1	0.00
Grand Total			0.63	0.34

Key: CW = Circular weeding SW = Slash weeding

Figure 36: Mean circle weeding and slash weeding scores by woodlots



4.3. Survival and stocking

4.3.1. Fire damage

Generally, at village level fire was not a major problem affecting survival of the tree seedling. Although at individual woodlot level, fire seems to be a major concern for future development of the woodlots. Currently, there were no surveyed woodlots affected by fire hence mitigate measure are vital for sustainability of the woodlots.

4.3.2. Height growth

Ukwama village mean dominant height was good as observed in Table 4.

Table 214: Mean dominant height description

Category	Description
Planting year/season	2015/16
Species group	Pines
Mean hdom (metres)	0.69

Key: hdom = Dominant height

4.3.3. Survival and stocking

Table 5 below shows the general survival percentage and mean stocking for Ukwama village. In general, the village average survival percentage was low as compared to other villages (Table 6).

Table 215: Mean survival percentage description

Category	Description
Planting year/season	2015/16
Species group	Pines
Mean stocking (stem per hectare)	1087
Mean survival percentage	84%

Table 216: The rank of villages by average survival percentage

Village name	Average survival percentage	Rank
Matembwe	99%	1
Usagatikwa	95%	2
Kidabaga	95%	3
Lusala	90%	4
Kiyowela	89%	5
Ukwama	84%	6
Ngalanga	83%	7
Maguguli	83%	8
Madope	83%	9
Ng'elamo	82%	10
Kifanya	82%	11
Mavanga	82%	12
Ikang'asi	81%	13
Iboya	79%	14
Itambo	77%	15
Mgala	76%	16
Utilili	72%	17
Kiwalamo	72%	18
Lugema	70%	19
Lugolofu	69%	20
Amani	68%	21
Makungu	61%	22
Ukwega	59%	23
Masimbwe	54%	24
Nhungu	48%	25

4.4. Weeding

4.4.1. Circular weeding

Table 7 below shows the general circular weeding score for Ukwama village. In general, the village average circular weeding score was low as compared to other villages (Table 8).

Table 217: Mean circular weeding score description

Category	Description
Planting year/season	2015/16
Species group	Pines
WC	0.63

Key: WC = Circular weeding scores,

Table 218: The rank of villages by average circular weeding score

Villages	Average circular weeding score	Rank
Usagatikwa	1.84	1
Matembwe	1.45	2
Lugema	1.39	3
Lugolofu	1.20	4
Kiyowela	1.10	5
Maguguli	1.04	6
Kiwalamo	0.96	7
Ukwega	0.83	8
Iboya	0.83	9
Mgala	0.82	10
Nhungu	0.76	11
Mavanga	0.76	12
Ukwama	0.63	13
Lusala	0.60	14
Makungu	0.52	15
Kifanya	0.44	16
Kidabaga	0.33	17
Itambo	0.32	18
Ikang'asi	0.27	19
Ng'elamo	0.21	20
Amani	0.15	21
Utilili	0.15	22
Ngalanga	0.06	23
Madope	0.01	24
Masimbwe	0.00	25

4.4.2. Slash weeding

Table 9 below shows the general slash weeding score for Ukwama village. In general, the village average slash weeding score was low as compared to other villages (Table 10).

Table 219: Mean slash weeding score description

Category	Description
Planting year/season	2015/16
Species group	Pines
WS	0.34

Key: WS = Slash weeding score

Table 220: The rank of villages by average slash weeding score

Villages	Average slash weeding score	Rank
Kidabaga	2.00	1
Matembwe	1.73	2
Kiyowela	1.15	3
Mavanga	1.14	4
Lugema	1.11	5
Lusala	0.93	6
Maguguli	0.88	7
Kiwalamo	0.85	8
Ukwega	0.83	9
Makungu	0.76	10
Madope	0.66	11
Mgala	0.58	12
Usagatikwa	0.47	13
Kifanya	0.35	14
Lugolofu	0.35	15
Ukwama	0.34	16
Utilili	0.33	17
Ikang'asi	0.31	18
Itambo	0.30	19
Nhungu	0.27	20
Amani	0.26	21
Iboya	0.22	22
Ngalanga	0.11	23
Masimbwe	0.03	24
Ng'elamo	0.00	25

5. CONCLUSION AND RECOMMENDATION

Generally, the villagers are encouraged to increase effort in the woodlots management activities especially weeding, in order to obtain better survival, growth and quality of trees.

Results from the survey observed a slight correlation between the weeding and survival percentage of the woodlots in Ukwama village. As described in Table 11, both, slash and circular weeding showed a negative and positive linear relationship to number of dead and live seedling respectively. This indicate that, woodlots with high weeding scores observed to have high number of live seedlings with less dead seedling.

Table 221: A correlation between weeding and survival score

Variable	Dead seedlings	Live seedlings
WC	-0.036	0.03
WS	-0.087	0.16

Key: WC = Circle weeding score WS = Slash weeding score

To some extent this information evaluate the need for weeding to increase survival percentage of the seedling in the woodlots. If both slash and circular weeding are done perfectly, then one could reduce the number of dead seedling and increase/maintain the number of live seedling in a particular woodlot. Scientifically weeding is proven to be vital for the survival of tree seedlings, since it reduces competition over nutrients, air and light between tree seedlings and weeds.

6. RESULTS FOR EACH INDIVIDUAL WOODLOT

Table 12 below shows the results for each individual beneficiary woodlots. It includes:

- ✚ Weeding score: both circular and slash weeding score
- ✚ Stem density (stem/ha)
- ✚ Survival percentage

Table 222: Village woodlots results

sRank	Pyear	Name	Gender	Area (acre)	Specie	WC	WS	Live	Dead	Total	Stock (stem/ha)	S-%	Hdom (metre)
1	2015/16	AIDEN VIOLETH	Male	1.43	pine	0	0	14	0	14	778	100%	0.35
2	2015/16	ALDO LUVANDA	Male	1.38	pine	0	0	15	0	15	833	100%	1.05
3	2015/16	BEDA NDELWA	Male	1.19	pine	2	0	21	0	21	1166	100%	0.55
4	2015/16	DAZO SANGA	Male	1.28	pine	0	0	17	0	17	944	100%	0.65
5	2015/16	DAZO SANGA	Male	0.00	pine	1	0	18	0	18	1000	100%	0.65
6	2015/16	ELIA NGAILO	Male	1.16	pine	0	0	24	0	24	1333	100%	1.05
7	2015/16	GALUSI MWEMUTSI	Male	1.38	pine	2	0	15	0	15	833	100%	1.25
8	2015/16	JEMSI LUVANDA	Male	1.28	pine	1	1	17	0	17	944	100%	1.05
9	2015/16	JEREMIA JACKOBO	Male	1.26	pine	3	1	21	0	21	1166	100%	0.65
10	2015/16	JOHN M SANGA	Male	1.83	pine	0	0	15	0	15	833	100%	0.65
11	2015/16	JOYCY LUVANDA	Female	1.80	pine	0	0	22	0	22	1222	100%	1
12	2015/16	MWENGE TWEVE	Male	1.85	pine	1	1	23	0	23	1278	100%	0.9
13	2015/16	OZWADI LUVANDA	Male	1.58	pine	1	0	17	0	17	944	100%	1.25
14	2015/16	PENDEKI ROMANUSI	Male	1.63	pine	0	0	24	0	24	1333	100%	0.45
15	2015/16	ROMANA TAVE	Female	0.89	pine	2	3	21	0	21	1166	100%	0.85
16	2015/16	SATOKI NGAILO	Male	1.48	pine	2	2	18	0	18	1000	100%	1.15
17	2015/16	SHADI YOHANA	Male	1.46	pine	0	0	11	0	11	611	100%	0.95
18	2015/16	MATHAYO SANGA	Male	1.26	pine	0	0	22	1	23	1278	96%	0.45
19	2015/16	OMBENI LUVANDA	Male	1.53	pine	0	0	21	1	22	1222	95%	1.1
20	2015/16	VASKO NDELWA	Male	1.63	pine	0	0	21	1	22	1222	95%	0.95
21	2015/16	EMESTO SANGA	Male	0.99	pine	0	0	20	1	21	1166	95%	0.55
22	2015/16	ESTA LUVANDA	Female	1.66	pine	0	0	20	1	21	1166	95%	0.55
23	2015/16	HELEMANI PELESI	Male	1.24	pine	1	1	20	1	21	1166	95%	0.4
24	2015/16	MUSUYA TWEVE	Male	1.33	pine	1	0	20	1	21	1166	95%	0.6
25	2015/16	PASTO NGAILO	Male	1.48	pine	2	0	20	1	21	1166	95%	0.65
26	2015/16	ESI CHAULA	Male	1.14	pine	1	0	19	1	20	1111	95%	1.2
27	2015/16	JANGALA LUVANDA	Male	1.04	pine	0	0	19	1	20	1111	95%	0.95
28	2015/16	AGINIWE SANGA	Male	1.14	pine	0	0	18	1	19	1055	95%	0.65
29	2015/16	ATILIYO SANGA	Male	1.83	pine	0	0	16	1	17	944	94%	0.75

sRank	Pyear	Name	Gender	Area (acre)	Specie	WC	WS	Live	Dead	Total	Stock (stem/ha)	S-%	Hdom (metre)
30	2015/16	NELESON SANGA	Male	1.73	pine	1	2	14	1	15	833	93%	0.75
31	2015/16	IMANI K SANGA	Male	1.14	pine	0	0	11	1	12	667	92%	0.65
32	2015/16	JUMNNE LUVANDA	Male	1.16	pine	2	1	20	2	22	1222	91%	0.7
33	2015/16	MTUMISI NYONDO	Male	1.26	pine	0	0	20	2	22	1222	91%	0.95
34	2015/16	SADRO TWEVE	Male	0.00	pine	0	0	20	2	22	1222	91%	0.65
35	2015/16	YOSOFINA PILA	Female	0.77	pine	0	0	20	2	22	1222	91%	0.55
36	2015/16	AGNES SANGA	Female	0.00	pine	2	1	19	2	21	1166	90%	0.8
37	2015/16	AJETA SANGA	Female	0.00	pine	1	3	19	2	21	1166	90%	1.05
38	2015/16	FESTINA MAHAVA	Female	1.43	pine	0	0	19	2	21	1166	90%	0.55
39	2015/16	GAITANI SANGA	Male	1.43	pine	2	2	19	2	21	1166	90%	0.7
40	2015/16	JACKILNI SANGA	Female	2.55	pine	1	1	19	2	21	1166	90%	0.65
41	2015/16	JACKSON PILLA	Male	1.46	pine	2	0	19	2	21	1166	90%	0.55
42	2015/16	JEREMIA CHAULA	Male	1.16	pine	0	1	19	2	21	1166	90%	0.55
43	2015/16	MIKAEL SANGA	Male	1.24	pine	2	2	19	2	21	1166	90%	0.6
44	2015/16	ROMANA TAVE	Female	0.94	pine	2	1	19	2	21	1166	90%	0.65
45	2015/16	TANASI TAVE	Male	2.82	pine	0	0	19	2	21	1166	90%	0.55
46	2015/16	JACKSONI LUVANDA	Male	0.00	pine	0	0	18	2	20	1111	90%	0.55
47	2015/16	NEFAUSI NGAILO	Male	0.94	pine	1	2	18	2	20	1111	90%	0.55
48	2015/16	ABASI TWEVE	Male	1.93	pine	1	0	17	2	19	1055	89%	0.4
49	2015/16	JAMES SANGA N2	Male	1.85	pine	1	1	17	2	19	1055	89%	0.65
50	2015/16	YOHANESS SANGA	Male	1.31	pine	1	1	17	2	19	1055	89%	0.55
51	2015/16	JONI TAVE	Male	1.78	pine	0	0	16	2	18	1000	89%	0.55
52	2015/16	LUSANI TWEVE	Male	2.45	pine	0	0	16	2	18	1000	89%	0.45
53	2015/16	SIKITIKO MAHENGE	Female	1.56	pine	0	0	24	3	27	1500	89%	0.75
54	2015/16	TADEHI SANGA	Male	1.71	pine	0	0	16	2	18	1000	89%	1
55	2015/16	WEMA LUVANDA	Male	0.00	pine	0	0	16	2	18	1000	89%	1.15
56	2015/16	YUNELIA TAVE	Male	1.75	pine	0	1	16	2	18	1000	89%	0.55
57	2015/16	YUDA TWEVE	Male	1.31	pine	2	0	15	2	17	944	88%	0.25
58	2015/16	IMANI TAVE	Male	1.06	pine	0	0	21	3	24	1333	88%	0.65
59	2015/16	JAKOBO SANGA	Male	1.58	pine	0	0	14	2	16	889	88%	1.2

sRank	Pyear	Name	Gender	Area (acre)	Specie	WC	WS	Live	Dead	Total	Stock (stem/ha)	S-%	Hdom (metre)
60	2015/16	MALIETA SANGA	Female	1.53	pine	0	0	21	3	24	1333	88%	0.5
61	2015/16	WEMA LUVANDA	Female	1.63	pine	0	0	14	2	16	889	88%	0.8
62	2015/16	ZUBERI TAVE	Male	2.22	pine	0	0	14	2	16	889	88%	0.8
63	2015/16	ROMANUSI SANGA	Male	2.13	pine	2	1	13	2	15	833	87%	0.55
64	2015/16	TERESIA MAHENGGE	Female	2.03	pine	0	0	13	2	15	833	87%	0.9
65	2015/16	AJUAYE MWINUKA	Male	2.77	pine	2	1	19	3	22	1222	86%	0.55
66	2015/16	FELDO SANGA	Male	0.94	pine	1	2	19	3	22	1222	86%	0.95
67	2015/16	MAONYESHO SANGA	Male	2.10	pine	2	1	19	3	22	1222	86%	0.35
68	2015/16	NIBLETY SANGA	Male	1.33	pine		1	19	3	22	1222	86%	0.75
69	2015/16	TOMASI PILLA	Male	1.41	pine	0	0	19	3	22	1222	86%	0.7
70	2015/16	AGNASI SANGA	Female	1.33	pine	2	0	18	3	21	1166	86%	0.95
71	2015/16	AMIDU LUVANDA	Male	1.21	pine	0	0	18	3	21	1166	86%	0.65
72	2015/16	BERITA SANGA	Female	1.26	pine	1	1	18	3	21	1166	86%	0.9
73	2015/16	CHESKO RASHIDI	Male	1.24	pine	0	0	18	3	21	1166	86%	1.15
74	2015/16	DAUDI NDELWA	Male	1.41	pine	0	0	18	3	21	1166	86%	0.85
75	2015/16	EDWINI TWEVE	Male	2.27	pine	0	0	6	1	7	389	86%	0.75
76	2015/16	ELIMU NGAILO	Male	2.22	pine	0	0	18	3	21	1166	86%	0.7
77	2015/16	JACKRIN LUVANDA	Female	1.48	pine	0	0	18	3	21	1166	86%	0.45
78	2015/16	JULIASI NYONDO	Male	1.33	pine	1	1	24	4	28	1555	86%	0.95
79	2015/16	MALIO LUVANDA	Male	1.04	pine	0	0	18	3	21	1166	86%	0.65
80	2015/16	MEDI PILLA	Male	1.21	pine	0	0	18	3	21	1166	86%	0.85
81	2015/16	NATU LUVANDA	Male	1.19	pine	1	0	18	3	21	1166	86%	0.55
82	2015/16	NEEMA SANGA	Female	1.43	pine	1	0	18	3	21	1166	86%	0.65
83	2015/16	OBETY LUVANDA	Male	1.01	pine	0	0	18	3	21	1166	86%	1
84	2015/16	TUPAKI LUVANDA	Male	1.43	pine	0	0	18	3	21	1166	86%	0.45
85	2015/16	YOSOFATI SANGA	Male	1.09	pine	0	0	18	3	21	1166	86%	0.55
86	2015/16	ASHA NDELWA	Female	1.58	pine	0	0	17	3	20	1111	85%	0.65
87	2015/16	AUZEBIO NDELWA	Male	1.31	pine	0	0	17	3	20	1111	85%	0.55
88	2015/16	JULIASI NENULA	Male	1.61	pine	1	0	17	3	20	1111	85%	0.9
89	2015/16	ROSI SANGA	Female	1.48	pine	1	1	17	3	20	1111	85%	0.65

sRank	Pyear	Name	Gender	Area (acre)	Specie	WC	WS	Live	Dead	Total	Stock (stem/ha)	S-%	Hdom (metre)
90	2015/16	VENANSI TWEVE	Male	0.00	pine	1	0	17	3	20	1111	85%	0.4
91	2015/16	BIKOSI SANGA	Male	1.09	pine	1	1	16	3	19	1055	84%	1.05
92	2015/16	JALEDI SANGA	Male	2.30	pine	2	1	16	3	19	1055	84%	0.75
93	2015/16	MIKAEL LUVANDA	Male	1.21	pine	0	0	16	3	19	1055	84%	0.35
94	2015/16	ROBATI CHAULA	Male	1.21	pine	0	0	16	3	19	1055	84%	0.65
95	2015/16	TUVALANI LUVANDA	Male	0.84	pine	0	0	16	3	19	1055	84%	0.55
96	2015/16	SHABANI NYONDO		0.91	pine	1	0	15	3	18	1000	83%	0.75
97	2015/16	TIMOTH SANGA	Male	0.79	pine	0	0	15	3	18	1000	83%	0.5
98	2015/16	DAUDI CHAULA	Male	1.36	pine	2	0	19	4	23	1278	83%	0.45
99	2015/16	HELY LUVANDA	Male	1.16	pine	0	0	19	4	23	1278	83%	0.55
100	2015/16	WAILOSI SANGA	Male	1.14	pine	3	1	19	4	23	1278	83%	0.6
101	2015/16	YOKONIA NGAILO	Male	1.19	pine	0	0	19	4	23	1278	83%	1.05
102	2015/16	NICKSON SANGA	Male	1.78	pine	1	0	14	3	17	944	82%	0.55
103	2015/16	JARABU SANGA	Male	2.10	pine	0	1	18	4	22	1222	82%	0.55
104	2015/16	LAWI SANGA	Male	1.63	pine	2	1	18	4	22	1222	82%	0.55
105	2015/16	TAFUTA SANG	Male	1.53	pine	0	0	9	2	11	611	82%	0.85
106	2015/16	AGUSTINO TWEVE	Male	1.90	pine	0	0	13	3	16	889	81%	0.95
107	2015/16	FULORA LUVANDA	Female	1.85	pine	1	0	13	3	16	889	81%	0.65
108	2015/16	AMOSI PILLA	Male	1.36	pine	0	0	17	4	21	1166	81%	0.65
109	2015/16	CASTORY TWEVE	Male	1.90	pine	0	0	17	4	21	1166	81%	0.65
110	2015/16	DASTINE TAVE	Male	1.11	pine	0	0	17	4	21	1166	81%	0.65
111	2015/16	ESKO LUVANDA	Male	1.14	pine	0	0	17	4	21	1166	81%	0.95
112	2015/16	MWITA SANGA	Male	1.31	pine	0	0	17	4	21	1166	81%	0.55
113	2015/16	SADRO TWEVE	Male	1.36	pine	0	0	17	4	21	1166	81%	0.45
114	2015/16	SINAHALI LUVANDA	Male	1.51	pine	1	0	17	4	21	1166	81%	0.6
115	2015/16	GILBATI KALESU	Male	3.06	pine	0	0	16	4	20	1111	80%	0.45
116	2015/16	LONZI TWEVE	Male	0.00	pine	1	0	16	4	20	1111	80%	0.7
117	2015/16	LUKINDO HENRICK	Male	1.09	pine	0	0	16	4	20	1111	80%	0.5
118	2015/16	NAUMU CHAULA	Male	1.06	pine	0	0	16	4	20	1111	80%	0.55
119	2015/16	ROJASI LUVANDA	Male	1.58	pine	1	0	16	4	20	1111	80%	0.8

sRank	Pyear	Name	Gender	Area (acre)	Specie	WC	WS	Live	Dead	Total	Stock (stem/ha)	S-%	Hdom (metre)
120	2015/16	SELINA SANGA	Female	1.68	pine	1	0	12	3	15	833	80%	0.45
121	2015/16	SHAKILA MSIGALA	Female	1.73	pine	1	0	12	3	15	833	80%	0.45
122	2015/16	SIMON SANGA	Male	0.00	pine	1	0	16	4	20	1111	80%	0.6
123	2015/16	NESTA SANGA	Male	1.38	pine	2	2	15	4	19	1055	79%	1
124	2015/16	LUSIA LUVANDA	Female	1.46	pine	0	0	11	3	14	778	79%	0.35
125	2015/16	ASHERI CHAULA	Female	1.24	pine	1	1	18	5	23	1278	78%	0.55
126	2015/16	BARUASI SANGA	Male	1.41	pine	0	1	17	5	22	1222	77%	0.65
127	2015/16	ELETINA TWEVE	Female	1.95	pine	0	0	17	5	22	1222	77%	0.65
128	2015/16	JULIANA LUVANDA	Male	1.38	pine	1	2	17	5	22	1222	77%	0.8
129	2015/16	SHADRACK LUVANDA	Male	1.46	pine	2	1	17	5	22	1222	77%	0.55
130	2015/16	BOSKO NENULA	Female	1.68	pine	1	1	10	3	13	722	77%	0.6
131	2015/16	BAHATI SANGA	Female	2.32	pine	0	1	16	5	21	1166	76%	0.55
132	2015/16	FANUEL CHAULA	Male	1.11	pine	0	0	16	5	21	1166	76%	0.75
133	2015/16	FESTO KONGA	Male	1.24	pine	0	0	16	5	21	1166	76%	0.55
134	2015/16	ROSE TWEVE	Male	1.33	pine	1	0	16	5	21	1166	76%	0.75
135	2015/16	SKOLA LUVANDA	Female	1.28	pine	1	1	16	5	21	1166	76%	0.65
136	2015/16	ESITA SANGA	Female	1.33	pine	0	0	21	7	28	1555	75%	0.7
137	2015/16	FOCUS SANGA	Male	1.19	pine	1	0	15	5	20	1111	75%	0.5
138	2015/16	MATIASI SANGA	Male	1.31	pine	0	0	15	5	20	1111	75%	0.7
139	2015/16	YOHANA SANGA	Male	1.33	pine	0	0	12	4	16	889	75%	0.75
140	2015/16	FLUIDA ILOMO	Female	1.38	pine	0	0	14	5	19	1055	74%	0.75
141	2015/16	GLORIA SANGA	Female	1.41	pine	1	0	14	5	19	1055	74%	1.85
142	2015/16	JOEL SANGA	Male	1.73	pine	0	0	14	5	19	1055	74%	0.55
143	2015/16	ANDUWIS SANGA	Male	1.75	pine	0	0	16	6	22	1222	73%	0.5
144	2015/16	FREDRICK PANDILA	Male	1.95	pine	3	0	13	5	18	1000	72%	0.45
145	2015/16	BAYANA SANGA	Male	1.36	pine	0	0	10	4	14	778	71%	0.55
146	2015/16	ELEMONI CHAULA	Male	1.53	pine	0	0	15	6	21	1166	71%	0.8
147	2015/16	EMMANUEL SANGA	Male	0.35	pine	1	0	15	6	21	1166	71%	0.6
148	2015/16	FILMONI SANGA	Male	1.56	pine	0	0	15	6	21	1166	71%	0.6
149	2015/16	JACKSON LUVANDA	Male	1.98	pine	1	1	15	6	21	1166	71%	0.45

Annex 1

7. WOODLOT ASSESSMENT FIELD SURVEY FORM

Surveyors: _____ Date: _____

WOODLOT LOCATION & OWNERSHIP

8. Coordinates by GPS

9. GPS accuracy

--

10. Village: _____ District: _____

11. Woodlot owner Name, Phone number and ID number (if applicable):

12. Has the woodlot changed owner since establishment? No / Yes / Unknown

If Yes, fill in the original owner: _____

PLOT MEASUREMENTS

13. Number of trees alive in the plot

--

14. Number of trees dead in the plot

--

15. Total number of trees in the plot

--

16. Height of the plot tallest tree (in decimetres): _____ dm, Second tallest tree: _____ dm

17. In case there are dead trees, assess the likely main cause of death:

Suppression by weeds	<input type="checkbox"/>	Cattle trampling:	<input type="checkbox"/>
Fire damage	<input type="checkbox"/>	Drought stress:	<input type="checkbox"/>
Disease	<input type="checkbox"/>	Other:	<input type="checkbox"/>
Insect damage	<input type="checkbox"/>	(specify "Other" in remarks)	

GENERAL WOODLOT DATA

18. Species group: Pine / Eucalyptus
 / Teak

19. Level of circle weeding in the woodlot:

20. Level of slash weeding in the woodlot:

Scale: 0 – No weeding done
 1 – Some weeding done, but not acceptably
 2 – Weeding activities done acceptably
 3 – Weeding activities done completely

ADDITIONAL REMARKS BY SURVEYORS

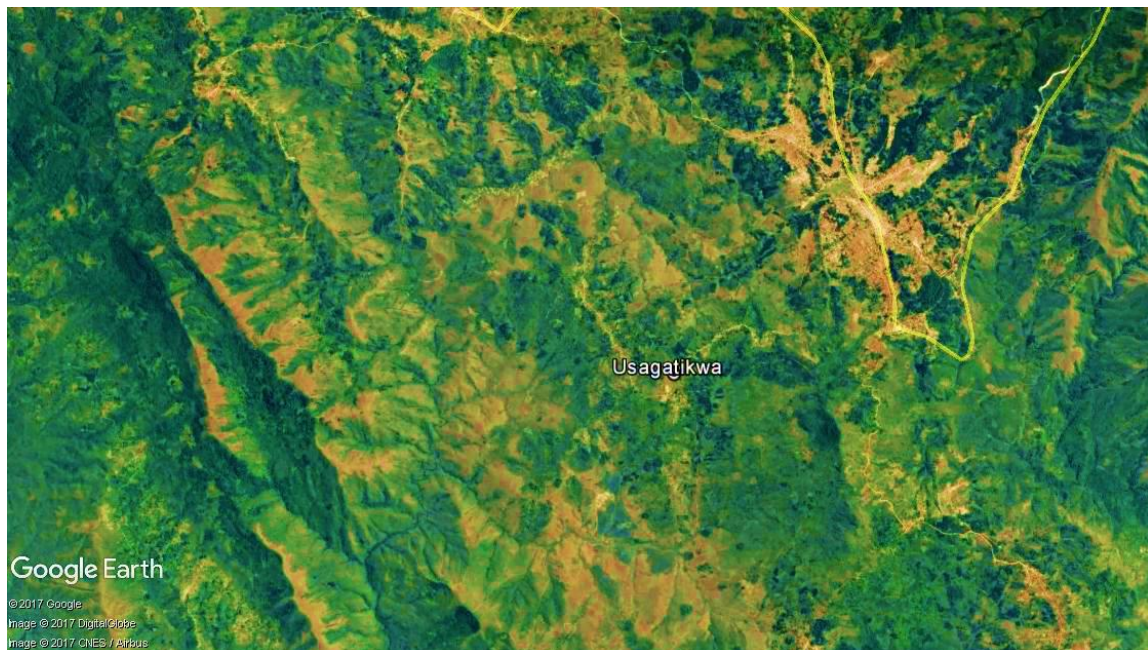
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End of Dry Season woodlot assessment 2016/17

End of Dry season survey feedback report for Usagatikwa village

June 2017, Iringa, Tanzania



United Republic of Tanzania
**MINISTRY OF NATURAL RESOURCES
AND TOURISM**
Forestry and Beekeeping Division



EMBASSY OF FINLAND
DAR ES SALAAM

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LIST OF ANNEXES

Annex 1: Woodlot assessment field survey form

ABBREVIATIONS

GPS	Global Positioning System
PFP	Private Forestry Programme
TGIS	Tree Growing Incentive Scheme

1. INTRODUCTION

1.1. Background

The Private Forestry Programme (PFP) is a Finnish funded development aid programme designed to run from 2014 to 2030. It increases wealth in the Southern Highlands by promoting commercial management of smallholder plantations and wood processing enterprises.

This field survey was carried out in 25 villages that have been supported in planting trees by PFP. The field work was done from December 2016 to February 2017. The purpose of the field work was to assess the performance and management of the woodlots. The results will be used by PFP to improve its support models in the future.

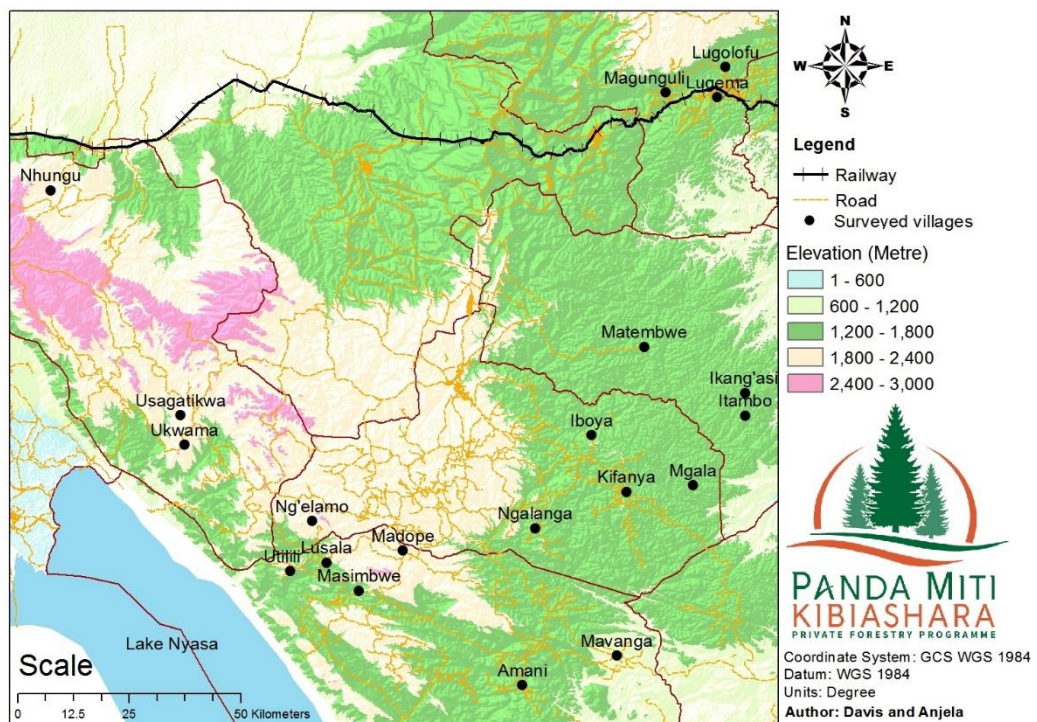
1.2. Objectives of the survey

- i. To assess the performance, survival, and level of management of the woodlots established through PFP support during the first two years of the programme.
- ii. To verify the status of the woodlots included in the PFP database.
- iii. To interview supported beneficiaries for collection of socioeconomic data.

2. LOCATION OF THE VILLAGE

Usagatikwa village is situated between latitude 9° 23' south and longitude 34° 12' east. The village is found in the south eastern highland areas of Makete district in Njombe region and it is characterised as wet intermediate agro ecological zone (Figure. 1). The elevation ranges between 1200m to 2460m a.s.l. and the soil texture is clay silt and alluvial soils in the valley bottom areas.

Figure 37: A map showing the location of Usagatikwa village with respect to other surveyed villages



3. METHODOLOGY

3.1. Field procedures

The field teams conducted the following activities while surveying the woodlots:

- ✚ Navigating to the woodlots using GPS receiver and support from local TGA personnel
- ✚ Then, a rope of radius of 7.57m was used to define the boundary of a sample plot within the woodlot
- ✚ Within the sample plots, the number of live and dead seedlings were counted (Annex 1).
- ✚ Also the level of weeding was assessed as shown in Table 1
- ✚ Metal bar was inserted for the 2015/16 established woodlots, so that they can be found later with a metal detector if needed.

Table 223 Classification for the level of weeding

Category/ Score	Title	Definition
0	No weeding done	There are practically no signs of weeding activities done during the past rainy season
1	Some weeding done, but not acceptably	There is clear evidence of weeding activities taken place during the past rainy season; however they have not been done sufficiently to ensure tree survival, good quality and good growth in the woodlot.
2	Weeding activities done acceptably	There are some shortcomings in the weeding activities, but the overall level is clearly sufficient to help ensure tree survival, good quality and good growth in the woodlot.
3	Weeding activities done completely	There are practically no signs of shortcomings, and all weeding activities appear to be conducted throughout the woodlot.

Key: The classification was reflected against the technical guidelines for circle and slash weeding as presented in the PFP TGIS guidelines. These require:

- Circle weeding: 50 cm radius to be cleared of weeds without damage to the tree in the middle.
- Slash weeding: all living weeds cut lower than 30 cm height.

It should be noted that no decisions of approval or disapproval for the level of weeding for support purposes were done in relation to this exercise.

3.2. Calculations and statistical analysis

- ✚ **Stand density (stems/ha):** the number of live trees plus number of dead trees in the sample plot, extended into a figure per hectare.
- ✚ **Survival percentage:** the share of live trees of the total number of trees in the sample plot.
- ✚ **Dominant height:** Average calculated from the two tallest tree heights measured in the sample plot. Assuming 3 x 3 m planting density, the figure represents the average height of the 100 tallest trees in a hectare.

3.3. Tools

- ✚ GPS receiver
- ✚ Smartphones installed with ODK collect tool
- ✚ PVC pipe and Rope of 7.57m radius
- ✚ Metal bar

4. RESULTS

4.1. Woodlots description

- A total of 39 woodlots owned by 29 beneficiaries surveyed (Table 2).
- The village surveyed woodlots comprised a total area of 79.30 acres supported by the programme through TGIS in kind (Table 2).

Table 224: Village total number and area of woodlots

Planting year/season	Beneficiaries	Number of woodlot	Total area (acres)
2014/15	Female	1	1.26
	Male	8	14.04
	Inst. &V.group	1	10.87
2015/16	Female	2	2.42
	Male	24	37.09
	Inst. &V.group	3	13.62
Grand Total		39	79.30

Key: Inst. &V.group = Institutions and vulnerable groups

4.2. Weeding

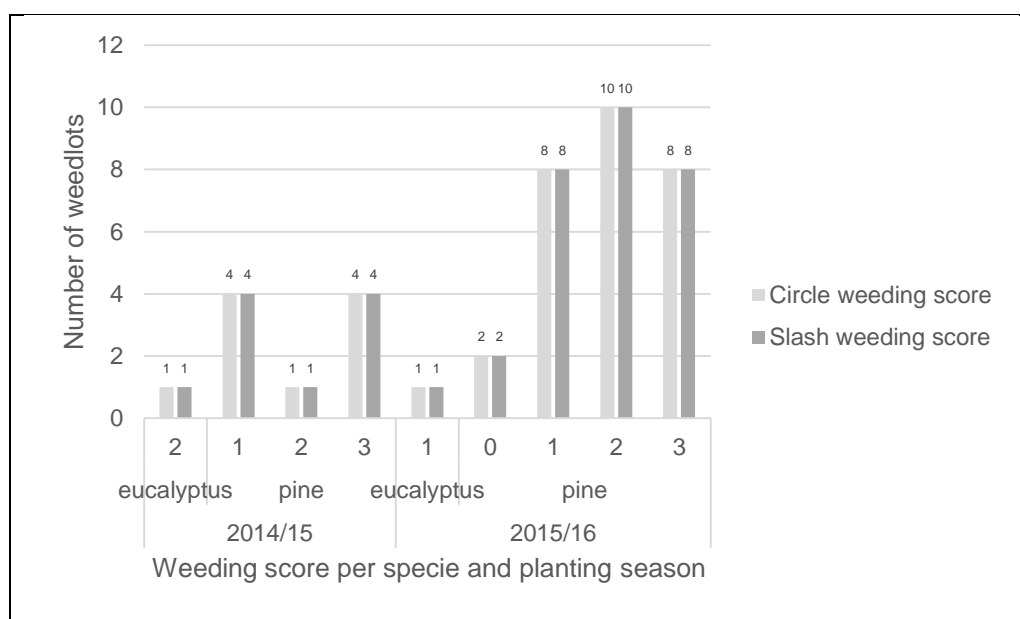
The observed score for both, circle and slash weeding were generally low (Table 3). The frequencies for assessed weeding scores are presented in Figure. 2.

Table 225 Mean circle weeding and slash weeding scores by specie group and year of stand establishment

Beneficiary	Specie group	Circle weeding		Slash weeding	
		2014/15	2015/16	2014/15	2015/16
Female	Pine	3.00	1.00	3.00	0.50
Male	Pine	1.88	1.88	0.13	0.46
Inst. &V.group	Pine	n/a	2.50	n/a	0.50
	Eucalyptus	2.00	1.00	1.00	0.00
Grand total		2.00	1.83	0.50	0.45

Key: Inst. &V.group = Institutions and vulnerable groups

Figure 38: Mean circle weeding and slash weeding scores by woodlots



4.3. Survival and stocking

4.3.1. Fire damage

Generally, at village level fire was not a major problem affecting survival of the tree seedling. Although, fire seems to be a major concern for the future development of the woodlots, hence mitigate measure are vital for sustainability of the woodlots.

4.3.2. Height growth

Usagatikwa village mean dominant height was good as observed in Table 4.

Table 226: Mean dominant height description

Specie group	hdom (metre)	
	2014/15	2015/16
Pines	1.02	0.69
Eucalyptus	1.05	0.95
Grand total	1.03	0.70

Key: hdom = Dominant height

4.3.3. Survival and stocking

Table 5 below shows the general survival percentage and mean stocking for Usagatikwa village. In general, the village average survival percentage was high, as compared to other villages (Table 6).

Table 227: Mean survival percentage description

Specie group	2014/15		2015/16	
	S-%	Stock (stem/ha)	S-%	Stock (stem/ha)
Pines	97%	1018	94%	1026
Eucalyptus	100%	1166	100%	1000
Grand total	97%	1033	94%	1025

Key: S-% = Survival percentage

Table 228: The rank of villages by average survival percentage

Village name	Average survival percentage	Rank
Matembwe	99%	1
Usagatikwa	95%	2
Kidabaga	95%	3
Lusala	90%	4
Kiyowela	89%	5
Ukwama	84%	6
Ngalanga	83%	7
Maguguli	83%	8
Madope	83%	9
Ng'elamo	82%	10
Kifanya	82%	11
Mavanga	82%	12
Ikang'asi	81%	13
Iboya	79%	14
Itambo	77%	15
Mgala	76%	16
Utilili	72%	17
Kiwalamo	72%	18
Lugema	70%	19
Lugolofu	69%	20
Amani	68%	21
Makungu	61%	22
Ukwega	59%	23
Masimbwe	54%	24
Nhungu	48%	25

4.4. Weeding

4.4.1. Circular weeding

Table 7 below shows the general circular weeding score for Usagatikwa village. In general, the village average circular weeding score was high as compared to other villages (Table 8).

Table 229: Mean circular weeding score description

Specie group	Circle weeding score	
	2014/15	2015/16
Pines	2.00	1.86
Eucalyptus	2.00	1.00
Grand total	2.00	1.83

Table 230: The rank of villages by average circular weeding score

Villages	Average circular weeding score	Rank
Usagatikwa	1.84	1
Matembwe	1.45	2
Lugema	1.39	3
Lugolofu	1.20	4
Kiyowela	1.10	5
Maguguli	1.04	6
Kiwalamo	0.96	7
Ukwega	0.83	8
Iboya	0.83	9
Mgala	0.82	10
Nhungu	0.76	11
Mavanga	0.76	12
Ukwama	0.63	13
Lusala	0.60	14
Makungu	0.52	15
Kifanya	0.44	16
Kidabaga	0.33	17
Itambo	0.32	18
Ikang'asi	0.27	19
Ng'elamo	0.21	20
Amani	0.15	21
Utilili	0.15	22
Ngalanga	0.06	23
Madope	0.01	24
Masimbwe	0.00	25

4.4.2. Slash weeding

Table 9 below shows the general slash weeding score for Usagatikwa village. In general, the village average slash weeding score was low as compared to other villages (Table 10).

Table 231: Mean slash weeding score description

Specie group	Slash weeding score	
	2014/15	2015/16
Pines	0.44	0.46
Eucalyptus	1.00	0.00
Grand total	0.50	0.46

Table 232: The rank of villages by average slash weeding score

Villages	Average slash weeding score	Rank
Kidabaga	2.00	1
Matembwe	1.73	2
Kiyowela	1.15	3
Mavanga	1.14	4
Lugema	1.11	5
Lusala	0.93	6
Maguguli	0.88	7
Kiwalamo	0.85	8
Ukwega	0.83	9
Makungu	0.76	10
Madope	0.66	11
Mgala	0.58	12
Usagatikwa	0.47	13
Kifanya	0.35	14
Lugolofu	0.35	15
Ukwama	0.34	16
Utilili	0.33	17
Ikang'asi	0.31	18
Itambo	0.30	19
Nhungu	0.27	20
Amani	0.26	21
Iboya	0.22	22
Ngalanga	0.11	23
Masimbwe	0.03	24
Ng'elamo	0.00	25

5. CONCLUSION AND RECOMMENDATION

Generally, the villagers are encouraged to increase effort in the woodlots management activities especially weeding, in order to obtain better survival, growth and quality of trees.

Results from the survey observed a slight correlation between the weeding and survival percentage of the woodlots in Usagatikwa village. As described in Table 11, both, slash and circular weeding showed a negative and positive linear relationship to number of dead and live seedling respectively. This indicate that, woodlots with high weeding scores observed to have high number of live seedlings with less dead seedling.

Table 233: A correlation between weeding and survival score

Variable	Dead seedlings	Live seedlings
WC	-0.098	0.073
WS	-0.046	0.197

Key: WC = Circle weeding score WS = Slash weeding score

To some extent this information evaluate the need for weeding to increase survival percentage of the seedling in the woodlots. If both slash and circular weeding are done perfectly, then one could reduce the number of dead seedling and increase/maintain the number of live seedling in a particular woodlot. Scientifically weeding is proven to be vital for the survival of tree seedlings, since it reduces competition over nutrients, air and light between tree seedlings and weeds.

6. RESULTS FOR EACH INDIVIDUAL WOODLOT

Table 12 below shows the results for each individual beneficiary woodlots. It includes:

- ✚ Weeding score: both circular and slash weeding score
- ✚ Stem density (stem/ha)
- ✚ Survival percentage

Table 234: Village woodlots results

sRank	Pyear	Name	Gender	Area (acres)	Specie	WC	WS	Live	Dead	Total	Stock (stem/ha)	S-%	Hdom (metre)
1	2014/15	JULIUS SIGALA	Male	0.67	pine	1	0	18	0	18	1000	100%	1.1
2	2015/16	IZAKI NYALUKE	Male	0.72	pine	1	0	16	0	16	889	100%	0.5
3	2015/16	MSAFIRI SANGA	Male	1.78	pine	3	0	19	0	19	1055	100%	0.45
4	2015/16	JULIUS SIGALA	Male	0.69	pine	1	0	21	0	21	1166	100%	0.65
5	2015/16	FADALI CHAULA	Male	0.37	pine	2	0	17	0	17	944	100%	0.7
6	2015/16	SIGALA PETRO	Male	1.83	pine	1	0	22	0	22	1222	100%	1.75
7	2014/15	AYUBU SANGA	Male	1.24	pine	1	0	16	0	16	889	100%	0.6
8	2015/16	IZACK SANGA	Male	1.93	pine	2	1	18	0	18	1000	100%	0.85
9	2014/15	ALBETRO SANGA	Male	1.04	pine	3	0	20	0	20	1111	100%	1.75
10	2015/16	ELIAKIM SANGA	Male		pine	3	0	20	0	20	1111	100%	1.75
11	2014/15	SALUMU SANGA	Male	6.20	pine	3	0	16	0	16	889	100%	1.65
12	2015/16	SALUMU SANGA	Male	3.01	pine	0	0	19	0	19	1055	100%	0.55
13	2015/16	IBRAHIM SANGA	Male	2.35	pine	2	0	15	0	15	833	100%	1.6
14	2015/16	BANZIA CHAULA	Male	0.32	pine	1	0	19	0	19	1055	100%	1.1
15	2015/16	NAZALENO SANGA	Male	1.09	pine	2	0	20	0	20	1111	100%	0.55
16	2015/16	BATHLOMEO SANGA	Male	0.69	pine	2	0	20	0	20	1111	100%	0.55
17	2015/16	BRUNO SANGA	Male	1.04	pine	2	0	16	0	16	889	100%	0.45
18	2014/15	KWINIBETI SANGA	Female	1.26	pine	3	3	18	0	18	1000	100%	0.7
19	2015/16	VULNERABLE GROUP		2.25	pine	3	1	19	0	19	1055	100%	0.8
20	2014/15	VULNERABLE GROUP		10.87	eucalyptus	2	1	21	0	21	1166	100%	1.05
21	2015/16	VULNERABLE GROUP		3.85	eucalyptus	1	0	18	0	18	1000	100%	0.95
22	2014/15	HAULE SANGA	Male	1.21	pine	2	0	20	0	20	1111	100%	1.2
23	2015/16	EXAUDI SANGA	Male	0.99	pine	2	1	18	0	18	1000	100%	0.6
24	2015/16	JOYCE SANGA	Female	1.04	pine	1	1	20	0	20	1111	100%	0.6
25	2014/15	ATUKUZWE SIGALA	Male	1.16	pine	1	0	18	0	18	1000	100%	0.65

sRank	Pyear	Name	Gender	Area (acres)	Specie	WC	WS	Live	Dead	Total	Stock (stem/ha)	S-%	Hdom (metre)
26	2015/16	CHRISTIAN CHAULA	Male	1.33	pine	3	0	19	0	19	1055	100%	0.6
27	2015/16	TAISODA SANGA	Male	0.84	pine	2	0	22	1	23	1278	96%	0.55
28	2015/16	ELIAKIM SANGA	Male	7.29	pine	1	0	19	1	20	1111	95%	0.55
29	2015/16	ERICK SANGA	Male	1.31	pine	3	3	15	1	16	889	94%	0.5
30	2015/16	PETRO SIGALA	Male	1.58	pine	3	3	14	1	15	833	93%	0.6
31	2015/16	ELIA SANGA	Male	0.72	pine	3	3	14	1	15	833	93%	0.35
32	2015/16	TUMAINI SANGA	Male	3.83	pine	2	0	18	2	20	1111	90%	0.35
33	2015/16	MESKO CHAULA	Male	1.06	pine	3	0	17	2	19	1055	89%	0.35
34	2014/15	MSAFIRI SANGA	Male	1.33	pine	3	0	15	2	17	944	88%	1
35	2015/16	AYUBU SANGA	Male	0.79	pine	0	0	15	3	18	1000	83%	0.45
36	2015/16	LAWRENCE SANGA	Male	1.53	pine	1	0	15	3	18	1000	83%	0.45
37	2014/15	ELIAKIMU SANGA	Male	1.19	pine	1	1	18	4	22	1222	82%	0.55
38	2015/16	SIJALI SANGA	Female	1.38	pine	1	0	13	4	17	944	76%	0.8
39	2015/16	VULNERABLE GROUP		7.51	pine	2	0	8	10	18	1000	44%	0.25

Key:	sRank	=	Rank based on survival score	Pyear	=	Planting year
	Name	=	Woodlot owner first and last name	Area	=	Area of the woodlot in hectare
	Specie	=	tree type (name)	WC	=	Circle weeding
	WS	=	Slash weeding	Live	=	Alive seedling
	Dead	=	Dead seedling	Total	=	Sum of seedling both dead and alive
	Stock	=	Total number of seedling per hectare	s-%	=	Survival percentage
	Sdeath	=	Score for dead seedling	hdom	=	Average height of two dominant (tallest) tree

Annex 1

7. WOODLOT ASSESSMENT FIELD SURVEY FORM

Surveyors: _____ Date: _____

WOODLOT LOCATION & OWNERSHIP

8. Coordinates by GPS

9. GPS accuracy

--

10. Village: _____ District: _____

11. Woodlot owner Name, Phone number and ID number (if applicable):

12. Has the woodlot changed owner since establishment? No / Yes / Unknown

If Yes, fill in the original owner: _____

PLOT MEASUREMENTS

13. Number of trees alive in the plot

--

14. Number of trees dead in the plot

--

15. Total number of trees in the plot

--

16. Height of the plot tallest tree (in decimetres): _____ dm, Second tallest tree: _____ dm

17. In case there are dead trees, assess the likely main cause of death:

Suppression by weeds <input type="checkbox"/>	Cattle trampling: <input type="checkbox"/>
Fire damage <input type="checkbox"/>	Drought stress: <input type="checkbox"/>
Disease <input type="checkbox"/>	Other: <input type="checkbox"/>
Insect damage <input type="checkbox"/>	(specify "Other" in remarks)

GENERAL WOODLOT DATA

18. Species group: Pine / Eucalyptus / Teak *Scale: 0 – No weeding done*

19. Level of circle weeding in the woodlot: _____ *1 – Some weeding done, but not acceptably*

20. Level of slash weeding in the woodlot: _____ *2 – Weeding activities done acceptably*

3 – Weeding activities done completely

ADDITIONAL REMARKS BY SURVEYORS

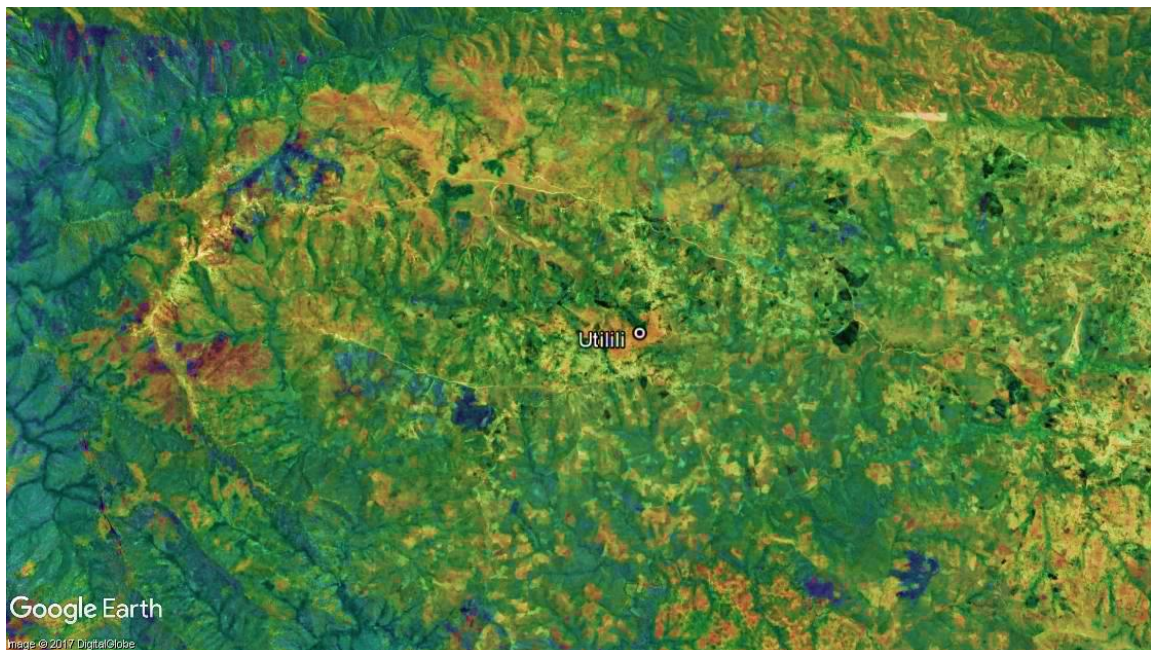
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End of Dry Season woodlot assessment 2016/17

End of Dry season survey feedback report for Utilili village

June 2017, Iringa, Tanzania



United Republic of Tanzania
**MINISTRY OF NATURAL RESOURCES
AND TOURISM**
Forestry and Beekeeping Division



**EMBASSY OF FINLAND
DAR ES SALAAM**

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LIST OF ANNEXES

Annex 1: Woodlot assessment field survey form

ABBREVIATIONS

GPS	Global Positioning System
PFP	Private Forestry Programme
TGIS	Tree Growing Incentive Scheme

1. INTRODUCTION

1.1. Background

The Private Forestry Programme (PFP) is a Finnish funded development aid programme designed to run from 2014 to 2030. It increases wealth in the Southern Highlands by promoting commercial management of smallholder plantations and wood processing enterprises.

This field survey was carried out in 25 villages that have been supported in planting trees by PFP. The field work was done from December 2016 to February 2017. The purpose of the field work was to assess the performance and management of the woodlots. The results will be used by PFP to improve its support models in the future.

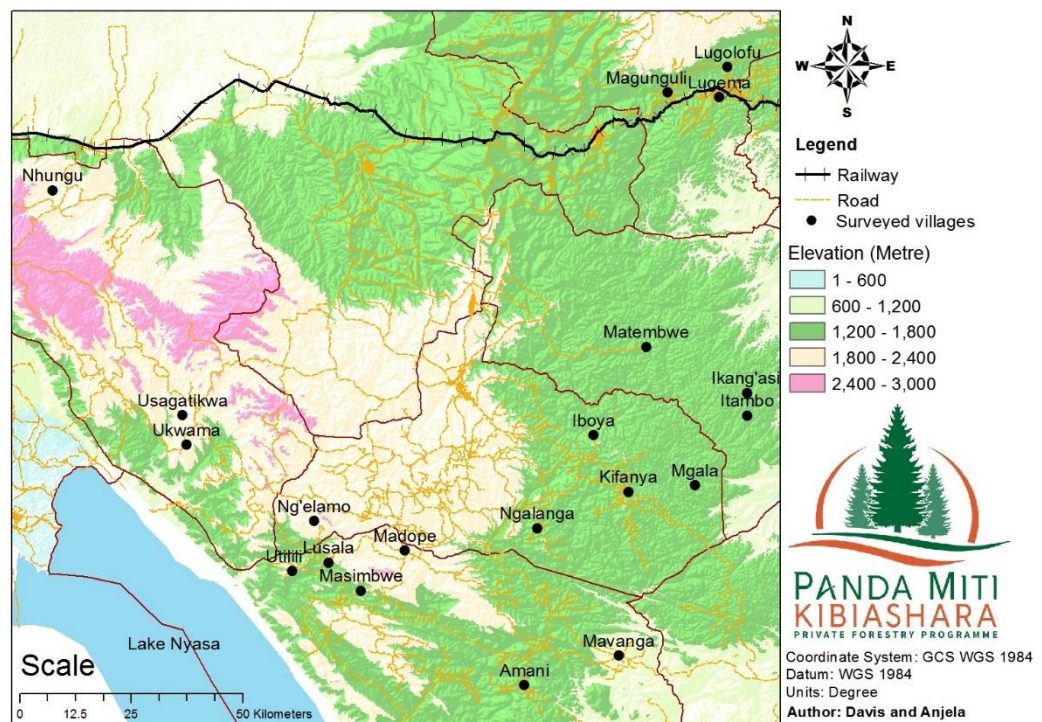
1.2. Objectives of the survey

- i. To assess the performance, survival, and level of management of the woodlots established through PFP support during the first two years of the programme.
- ii. To verify the status of the woodlots included in the PFP database.
- iii. To interview supported beneficiaries for collection of socioeconomic data.

2. LOCATION OF THE VILLAGE

Utilili village is situated between latitude 9° 42' south and longitude 34° 25' east. The village is found in the south eastern highland areas of Ludewa district in Njombe region and it is characterised as wet intermediate agro ecological zone (Figure. 1). The elevation ranges between 1000m to 2000m a.s.l. and the soil texture is clay silt and alluvial soils in the valley bottom areas.

Figure 39: A map showing the location of Utilili village with respect to other surveyed villages



3. METHODOLOGY

3.1. Field procedures

The field teams conducted the following activities while surveying the woodlots:

- ✚ Navigating to the woodlots using GPS receiver and support from local TGA personnel
- ✚ Then, a rope of radius of 7.57m was used to define the boundary of a sample plot within the woodlot
- ✚ Within the sample plots, the number of live and dead seedlings were counted (Annex 1).
- ✚ Also the level of weeding was assessed as shown in Table 1
- ✚ Metal bar was inserted for the 2015/16 established woodlots, so that they can be found later with a metal detector if needed

Table 235 Classification for the level of weeding

Category/ Score	Title	Definition
0	No weeding done	There are practically no signs of weeding activities done during the past rainy season
1	Some weeding done, but not acceptably	There is clear evidence of weeding activities taken place during the past rainy season; however they have not been done sufficiently to ensure tree survival, good quality and good growth in the woodlot.
2	Weeding activities done acceptably	There are some shortcomings in the weeding activities, but the overall level is clearly sufficient to help ensure tree survival, good quality and good growth in the woodlot.
3	Weeding activities done completely	There are practically no signs of shortcomings, and all weeding activities appear to be conducted throughout the woodlot.

Key: The classification was reflected against the technical guidelines for circle and slash weeding as presented in the PFP TGIS guidelines. These require:

- Circle weeding: 50 cm radius to be cleared of weeds without damage to the tree in the middle.
- Slash weeding: all living weeds cut lower than 30 cm height.

It should be noted that no decisions of approval or disapproval for the level of weeding for support purposes were done in relation to this exercise.

3.2. Calculations and statistical analysis

- ✚ **Stand density (stems/ha):** the number of live trees plus number of dead trees in the sample plot, extended into a figure per hectare.
- ✚ **Survival percentage:** the share of live trees of the total number of trees in the sample plot.
- ✚ **Dominant height:** Average calculated from the two tallest tree heights measured in the sample plot. Assuming 3 x 3 m planting density, the figure represents the average height of the 100 tallest trees in a hectare.

3.3. Tools

- ✚ GPS receiver
- ✚ Smartphones installed with ODK collect tool
- ✚ PVC pipe and Rope of 7.57m radius
- ✚ Metal bar

4. RESULTS

4.1. Woodlots description

- ✚ A total of 87 woodlots owned by 59 beneficiaries surveyed (Table 2).
- ✚ The village surveyed woodlots comprised a total area of 388.30 acres supported by the programme through TGIS in kind (Table 2).

Table 236: Village total number and area of woodlots

Planting year/season	Beneficiaries	Number of woodlot	Total area (acres)
2015/16	Female	20	44.31
	Male	62	282.22
	Inst. & V.group	5	61.78
Grand Total		59	388.30

Key: Inst. & V.group = Institutions and Vulnerable group

4.2. Weeding

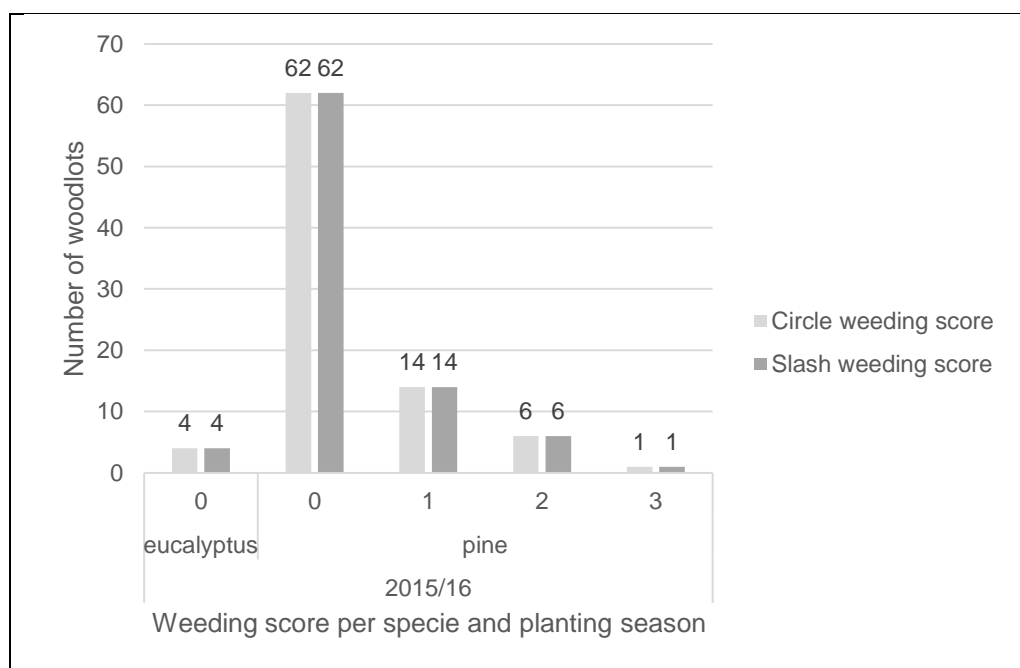
The observed score for both, circle and slash weeding were generally low (Table 3). The frequencies for assessed weeding scores are presented in Figure. 2.

Table 237 Mean circle weeding and slash weeding scores by species group and year of stand establishment

Planting year/season	Beneficiaries	Specie group	CW	SW
2015/16	Female	Eucalyptus	0.00	0.00
		Pine	0.21	0.58
	Male	Eucalyptus	0.00	0.00
		Pine	0.08	0.27
	Institution	Eucalyptus	0.00	0.00
		Pine	0.25	0.50
Grand Total			0.11	0.33

Key: CW = Circular weeding SW = Slash weeding

Figure 40: Mean circle weeding and slash weeding scores by woodlots



4.3. Survival and stocking

4.3.1. Fire damage

Generally, at village level fire was not a major problem affecting survival of the tree seedling. Although at individual woodlot level, fire seems to be a major concern for future development of the woodlots. In Utilili village two woodlots were affected by fire (Table 4), hence mitigate measure are vital for sustainability of the woodlots.

Table 238: Description of the woodlot damaged by fire

S/N	Remarks	Number
1	Number of woodlots	2
2	Area (acres)	3.86

4.3.2. Height growth

Utilili village mean dominant height was good as observed in Table 5.

Table 239: Mean dominant height description

Specie group	Mean hdom (metre)	
	2015/16	
Pines		0.69
Eucalyptus		0.58
Grand total		0.68

Key: hdom = Dominant height

4.3.3. Survival and stocking

Table 6 below shows the general survival percentage and mean stocking for Utilili village. In general, the village average survival percentage was low, as compared to other villages (Table 7).

Table 240: Mean survival percentage description

Specie group	2015/16	
	S-%	Stock (stem/ha)
Pines	72%	1017
Eucalyptus	76%	972
Grand total	72%	1015

Table 241: The rank of villages by average survival percentage

Village name	Average survival percentage	Rank
Matembwe	99%	1
Usagatikwa	95%	2
Kidabaga	95%	3
Lusala	90%	4
Kiyowela	89%	5
Ukwama	84%	6
Ngalanga	83%	7
Maguguli	83%	8
Madope	83%	9
Ng'elamo	82%	10
Kifanya	82%	11
Mavanga	82%	12
Ikang'asi	81%	13
Iboya	79%	14
Itambo	77%	15
Mgala	76%	16
Utilili	72%	17
Kiwalamo	72%	18
Lugema	70%	19
Lugolofu	69%	20
Amani	68%	21
Makungu	61%	22
Ukwega	59%	23
Masimbwe	54%	24
Nhungu	48%	25

4.4. Weeding

4.4.1. Circular weeding

Table 8 below shows the general circular weeding score for Utilili village. In general, the village average circular weeding score was low as compared to other villages (Table 9).

Table 242: Mean circular weeding score description

Specie group	WC	
	2015/16	
Pines		0.15
Eucalyptus		0.00
Grand total		0.15

Key: WC = Circular weeding scores,

Table 243: The rank of villages by average circular weeding score

Villages	Average circular weeding score	Rank
Usagatikwa	1.84	1
Matembwe	1.45	2
Lugema	1.39	3
Lugolofu	1.20	4
Kiyowela	1.10	5
Maguguli	1.04	6
Kiwalamo	0.96	7
Ukwega	0.83	8
Iboya	0.83	9
Mgala	0.82	10
Nhungu	0.76	11
Mavanga	0.76	12
Ukwama	0.63	13
Lusala	0.60	14
Makungu	0.52	15
Kifanya	0.44	16
Kidabaga	0.33	17
Itambo	0.32	18
Ikang'asi	0.27	19
Ng'elamo	0.21	20
Utilili	0.15	21
Amani	0.15	22
Ngalanga	0.06	23
Madope	0.01	24
Masimbwe	0.00	25

4.4.2. Slash weeding

Table 10 below shows the general slash weeding score for Utilili village. In general, the village average slash weeding score was low as compared to other villages (Table 11).

Table 244: Mean slash weeding score description

Specie group	WS	
	2015/16	
Pines		0.33
Eucalyptus		0.00
Grand total		0.33

Key: WS = Slash weeding score

Table 245: The rank of villages by average slash weeding score

Villages	Average slash weeding score	Rank
Kidabaga	2.00	1
Matembwe	1.73	2
Kiyowela	1.15	3
Mavanga	1.14	4
Lugema	1.11	5
Lusala	0.93	6
Maguguli	0.88	7
Kiwalamo	0.85	8
Ukwega	0.83	9
Makungu	0.76	10
Madope	0.66	11
Mgala	0.58	12
Usagatikwa	0.47	13
Kifanya	0.35	14
Lugolofu	0.35	15
Ukwama	0.34	16
Utilili	0.33	17
Ikang'asi	0.31	18
Itambo	0.30	19
Nhungu	0.27	20
Amani	0.26	21
Iboya	0.22	22
Ngalanga	0.11	23
Masimbwe	0.03	24
Ng'elamo	0.00	25

5. CONCLUSION AND RECOMMENDATION

Generally, the villagers are encouraged to increase effort in the woodlots management activities especially weeding, in order to obtain better survival, growth and quality of trees.

Results from the survey observed a slight correlation between the weeding and survival percentage of the woodlots in Utilili village. As described in Table 12, both, slash and circular weeding showed a negative and positive linear relationship to number of dead and live seedling respectively. This indicate that, woodlots with high weeding scores observed to have high number of live seedlings with less dead seedling.

Table 246: A correlation between weeding and survival score

Variable	Dead seedlings	Live seedlings
WC	-0.18	0.058
WS	-0.30	0.12

Key: WC = Circle weeding score WS = Slash weeding score

To some extent this information evaluate the need for weeding to increase survival percentage of the seedling in the woodlots. If both slash and circular weeding are done perfectly, then one could reduce the number of dead seedling and increase/maintain the number of live seedling in a particular woodlot. Scientifically weeding is proven to be vital for the survival of tree seedlings, since it reduces competition over nutrients, air and light between tree seedlings and weeds.

6. RESULTS FOR EACH INDIVIDUAL WOODLOT

Table 13 below shows the results for each individual beneficiary woodlots. It includes:

- ✚ Weeding score: both circular and slash weeding score
- ✚ Stem density (stem/ha)
- ✚ Survival percentage

Table 247: Village woodlots results

sRank	Gender	Pyear	Name	Area (acres)	Specie	WC	WS	Live	Dead	Total	Stock (stem/ha)	S-%	Hdom (metre)
1	Male	2015/16	INOSENTI MSEMWA	7.76	pine	0	0	26	2	28	1555	93%	1.55
2	Male	2015/16	JOSEPHAT MGAYA	0.35	pine	0	0	14	11	25	1389	56%	0.65
3	Male	2015/16	EDWARD MTEWA		pine	1	1	21	4	25	1389	84%	0.8
4	Male	2015/16	CHRISPIN MGENI	0.59	pine	0	0	18	5	23	1278	78%	0.65
5	Male	2015/16	PETRO MLELWA	0.79	pine	0	0	17	5	22	1222	77%	0.75
6	Male	2015/16	ADELEHEM MGAYA	2.05	pine	0	0	16	6	22	1222	73%	0.7
7	Male	2015/16	OCTAVIAN MLELWA	1.16	pine	0	0	10	12	22	1222	45%	0.55
8	Female	2015/16	HANSI MLELWA	6.62	pine	0	0	13	9	22	1222	59%	0.7
9	Male	2015/16	FRANCO MLELWA	6.65	pine	0	0	17	5	22	1222	77%	0.55
10	Male	2015/16	PIRIMINI MWINUKA	6.00	pine	0	0	14	8	22	1222	64%	0.55
11	Male	2015/16	GENEROZA MTEWA	1.93	pine	0	1	17	4	21	1166	81%	0.25
12	Female	2015/16	KONDRADA MTEWA	2.17	pine	0	0	15	6	21	1166	71%	0.5
13	Male	2015/16	LUDWIGI MTEWA	1.41	pine	0	1	16	5	21	1166	76%	0.45
14	Male	2015/16	VOLKA MWINUKA	8.33	pine	0	0	18	3	21	1166	86%	0.65
15	Male	2015/16	AIDAN MTEWA	2.15	pine	0	0	15	6	21	1166	71%	0.65
16	Female	2015/16	MODESTER MLELWA	2.69	pine	1	1	11	10	21	1166	52%	0.8
17	Male	2015/16	AMBROS MLELWA	17.87	pine	0	1	21	0	21	1166	100%	1.35
18	Male	2015/16	AMBROS MLELWA	8.97	pine	0	0	21	0	21	1166	100%	2.05
19	Male	2015/16	DEVIDI MLELWA	6.70	pine	0	1	18	3	21	1166	86%	1.05
20	Male	2015/16	INOSENTI MLELWA	1.09	pine	0	0	17	4	21	1166	81%	1.8
21	Male	2015/16	EDWARD MTEWA	63.11	pine	0	0	15	6	21	1166	71%	0.45
22		2015/16	ROMAN CATHOLIC CHURCH	14.80	pine	0	0	14	6	20	1111	70%	0.55
23	Male	2015/16	WOLFRAM MLELWA	1.48	pine	0	0	14	6	20	1111	70%	0.55
24	Female	2015/16	OLUSULA MTEGA	1.98	pine	0	2	15	5	20	1111	75%	0.5
25	Male	2015/16	HILMARY MLELWA	5.16	pine	0	0	10	10	20	1111	50%	0.9

sRank	Gender	Pyear	Name	Area (acres)	Specie	WC	WS	Live	Dead	Total	Stock (stem/ha)	S-%	Hdom (metre)
26	Male	2015/16	PETRO MGAYA	1.75	pine	0	0	18	2	20	1111	90%	0.7
27	Female	2015/16	ELIMINA MTEWA	1.88	pine	0	0	3	17	20	1111	15%	0.35
28	Female	2015/16	RITHA MLELWA	0.84	pine	0	0	18	2	20	1111	90%	0.75
29	Male	2015/16	AIDAN MTEWA	3.16	pine	0	0	18	2	20	1111	90%	0.75
30	Male	2015/16	OVIN NJELEKELA	12.82	pine	0	0	15	5	20	1111	75%	0.55
31	Female	2015/16	VERA MSEMWA	4.60	pine	0	0	11	9	20	1111	55%	0.55
32		2015/16	DEMO PLOT	2.67	eucalyptus	0	0	16	4	20	1111	80%	0.75
33	Male	2015/16	ERASTO MLELWA	0.91	pine	0	0	15	5	20	1111	75%	0.65
34	Female	2015/16	EPIFANIA MTEGA	1.19	pine	0	0	16	4	20	1111	80%	0.75
35	Male	2015/16	FRANZISKO NJELEKELA	6.84	pine	0	0	12	8	20	1111	60%	0.55
36	Male	2015/16	CASTORY MTEWA	0.69	pine	0	0	9	10	19	1055	47%	0.55
37	Male	2015/16	WOLFRAM MLELWA		pine	0	0	15	4	19	1055	79%	0.65
38	Male	2015/16	WOLFRAM MLELWA	1.56	pine	0	0	7	12	19	1055	37%	0.3
39	Male	2015/16	LUSTIKO MSANGA	0.52	pine	0	0	14	5	19	1055	74%	0.65
40	Male	2015/16	AIDANI MTEWA	5.81	pine	0	1	18	1	19	1055	95%	1.75
41	Male	2015/16	OVIN NJELEKELA	4.65	pine	0	1	10	9	19	1055	53%	0.35
42	Male	2015/16	HANSI MLELWA	6.67	pine	0	0	14	5	19	1055	74%	0.7
43		2015/16	UTILILI VILLAGE GOVERNMENT	9.17	pine	0	0	19	0	19	1055	100%	1.65
44	Male	2015/16	ERASTO MLELWA	2.20	pine	0	0	13	6	19	1055	68%	0.55
45	Female	2015/16	ERNESTA MLELWA	0.35	pine	2	0	15	4	19	1055	79%	0.35
46	Male	2015/16	INOCENT MSEMWA	3.09	pine	0	0	11	7	18	1000	61%	0.4
47	Male	2015/16	RAINERY MGANWA	5.12	pine	0	2	18	0	18	1000	100%	1.2
48	Male	2015/16	SALTARIUS MLELWA	0.74	pine	0	0	14	4	18	1000	78%	0.7
49	Male	2015/16	ELGIUS MSEMWA	5.66	pine	0	0	5	13	18	1000	28%	0.65
50	Male	2015/16	CRISPIN MGENI	3.51	pine	0	0	16	2	18	1000	89%	0.45

sRank	Gender	Pyear	Name	Area (acres)	Specie	WC	WS	Live	Dead	Total	Stock (stem/ha)	S-%	Hdom (metre)
51	Female	2015/16	BRIGITA NJELEKELA	3.16	pine	0	0	16	2	18	1000	89%	0.7
52	Male	2015/16	ODDO MTEWA	1.71	pine	2	2	14	4	18	1000	78%	1
53		2015/16	DEMO PLOT	2.03	pine	1	1	16	2	18	1000	89%	0.75
54	Male	2015/16	MARIANUS MGAYA	0.52	pine	0	0	6	12	18	1000	33%	0.55
55	Female	2015/16	AMANDA MLELWA	0.79	pine	0	0	15	3	18	1000	83%	0.75
56	Male	2015/16	STANSLAUS NJELEKELA	2.82	pine	0	0	12	5	17	944	71%	0.55
57	Female	2015/16	ILUMINATA	0.82	pine	1	2	16	1	17	944	94%	0.65
58	Male	2015/16	AIDAN MTEWA	3.26	pine	0	0	13	4	17	944	76%	0.55
59	Male	2015/16	AIDAN MTEWA	11.59	pine	0	0	12	5	17	944	71%	0.35
60	Male	2015/16	VINTANI CHAULA	1.78	eucalyptus	0	0	12	5	17	944	71%	0.25
61	Male	2015/16	OVIN NJELEKELA	0.35	eucalyptus	0	0	13	4	17	944	76%	0.65
62	Female	2015/16	VERA MSEMWA	1.90	pine	0	0	9	8	17	944	53%	0.65
63	Female	2015/16	BIRIGITA NJELEKELA	0.99	pine	0	0	12	5	17	944	71%	0.65
64	Female	2015/16	BILGITHA NJELEKELA	1.61	pine	0	0	10	7	17	944	59%	0.7
65	Male	2015/16	FRANKO MLELWA	3.21	pine	0	0	12	5	17	944	71%	0.8
66	Male	2015/16	STEPHANI MTEWA	1.21	pine	0	0	14	3	17	944	82%	0.85
67	Male	2015/16	SALTARIUS MLELWA	5.31	pine	0	1	13	4	17	944	76%	0.4
68	Male	2015/16	SIXBERITI MWINUKA	0.99	pine	0	0	12	5	17	944	71%	0.75
69	Female	2015/16	BADWIN MLELWA	1.48	pine	0	1	10	6	16	889	63%	0.5
70	Male	2015/16	EVA HAULE	4.99	pine	0	2	11	5	16	889	69%	0.45
71	Male	2015/16	SALTARIUS MLELWA	8.53	pine	0	0	6	10	16	889	38%	0.45
72	Male	2015/16	RAFAEL MLELWA	0.69	pine	0	0	13	3	16	889	81%	0.7
73	Female	2015/16	MELANIA MGIMBA	0.84	eucalyptus	0	0	12	4	16	889	75%	0.65
74	Male	2015/16	FREDI MLELWA	3.06	pine	0	0	12	4	16	889	75%	0.7
75	Female	2015/16	VERA MSEMWA	2.00	pine	0	1	12	4	16	889	75%	0.35

sRank	Gender	Pyear	Name	Area (acres)	Specie	WC	WS	Live	Dead	Total	Stock (stem/ha)	S-%	Hdom (metre)
76	Male	2015/16	LUSIANA CHAULA	2.30	pine	0	0	14	1	15	833	93%	0.35
77	Male	2015/16	FEBRUARY MGANWA	1.14	pine	0	0	9	6	15	833	60%	0.45
78	Male	2015/16	FRANCO MLELWA	3.29	pine	0	0	8	7	15	833	53%	0.6
79	Male	2015/16	PIUSI MTEWA	3.34	pine	0	0	10	5	15	833	67%	0.45
80	Male	2015/16	INNOSENTI MSEMWA	1.85	pine	2	2	10	3	13	722	77%	0.55
81	Male	2015/16	STANSLAUS NJELEKELA	0.27	pine	0	0	8	5	13	722	62%	0.55
82	Male	2015/16	VINTAN CHAULA	2.59	pine	0	0	9	4	13	722	69%	0.75
83	Female	2015/16	BILGITA NJELEKELA	6.75	pine	0	3	12	1	13	722	92%	0.5
84	Female	2015/16	ADELFINA MLELWA	1.66	pine	0	1	8	5	13	722	62%	0.7
85	Male	2015/16	STEPHAN MTEWA	2.79	pine	0	0	7	4	11	611	64%	0.35
86		2015/16	VULNERABLE GROUP	33.11	pine	0	1	7	0	7	389	100%	1
87	Male	2015/16	SALTALIUS MLELWA	5.39	pine	0	0	0	0	0	0		

Key:	sRank = Rank based on survival score	Pyear = Planting year
	Name = Woodlot owner first and last name	Area = Area of the woodlot in hectare
	Specie = tree type (name)	WC = Circle weeding
	WS = Slash weeding	Live = Alive seedling
	Dead = Dead seedling	Total = Sum of seedling both dead and alive
	Stock = Total number of seedling per hectare	s-% = Survival percentage
	Sdeath = Score for dead seedling	hdom = Average height of two dominant (tallest) tree



Form Number:

Annex 1

7. WOODLOT ASSESSMENT FIELD SURVEY FORM

Surveyors: _____ Date: _____

WOODLOT LOCATION & OWNERSHIP

8. Coordinates by GPS

9. GPS accuracy

10. Village: _____ District: _____

11. Woodlot owner Name, Phone number and ID number (if applicable):

12. Has the woodlot changed owner since establishment? No / Yes / Unknown

If Yes, fill in the original owner: _____

PLOT MEASUREMENTS

13. Number of trees alive in the plot

14. Number of trees dead in the plot

15. Total number of trees in the plot

16. Height of the plot tallest tree (in decimetres): _____ dm, Second tallest tree:
_____ dm

17. In case there are dead trees, assess the likely main cause of death:

Suppression by weeds	<input type="checkbox"/>	Cattle trampling:	<input type="checkbox"/>
Fire damage	<input type="checkbox"/>	Drought stress:	<input type="checkbox"/>
Disease	<input type="checkbox"/>	Other:	<input type="checkbox"/>
Insect damage	<input type="checkbox"/>	(specify "Other" in remarks)	

GENERAL WOODLOT DATA

18. Species group: Pine / Eucalyptus
 / Teak

19. Level of circle weeding in the woodlot:

20. Level of slash weeding in the woodlot:

Scale: 0 – No weeding done
 1 – Some weeding done, but
 not acceptably

 2 – Weeding activities done
 acceptably
 3 – Weeding activities done
 completely

ADDITIONAL REMARKS BY SURVEYORS

