Forest Biophysical Field Data Entry Booklet

Integrated Land Use Assessment Phase II
Zambia

Lusaka, May 2013

Forestry Department,
Ministry of Lands, Natural Resources and Environmental Protection

in cooperation with

Food and Agriculture Organization (FAO)

Province: .....

District: .....

Cluster:.....

Form Description

	Form	Form #
1	Cluster Data form	F1
2	Plot information general	F2
3	Plot LUVS information	F3
4	Regeneration data form	F4
5	Sampling data form	F5 a
6	Tree data form	F5 b
7	Stumps, Deadwood data form	F6
8	Bamboo data form	F7
9	Soil data form	F8
10	Litter data form	F9

Flow chat illustrating ILUA II biophysical field data collection

Navigation and recording distance of permanent infrastructure in area to cluster center F1

Navigate and locate cluster using preloaded coordinates F1

Layout and establish plot 1 and record general plot information F2

Fill in section A of LUVS plot information data and fill in the rest of as you progress in plot F3

Complete sections on plot use and history F3

Establish regeneration subplot fill in regeneration data F4

Establish sapling subplot and fill in sapling form F5a

Fill in tree data form F5B

Fill in stumps, Deadwood form F6

Fill in Bamboo form F7

Fill in soil form (on soil cluster) F8

Fill in litter form (on soil cluster) F9

Once work is completed in plot move to next plot and repeat same procedure

1a. **Cluster Number**	
1b. **ILUA I Number**	

A. Cluster Location					
2. Province		6. ILUA I cluster [Y/N]			
3. District		7. Soil sampling cluster [Y/N]			
4. Township		8. UTM Zone	34	35	36
5. Village/Locality					

B. Crew list			
Name	**Address**	**Phone Number**	**Role**
			9. Team Leader
			Assistant TL
			10. Enumerator
			Enumerator
			Local
			Local
			Driver

C. Equipment Used	
11. GPS (Name, model)	

D. Proximity to Infrastructure	
13. All weather road	
14. Seasonal road	
15. Settlement	
16. Health institution	
17. School	
18. Food Market	
19. Input Market	

[Land tenure questions moved to Form F3]

E. Cluster Access	
20. Accessibility [code]	
Starting position coordinates (leaving vehicle)	
21. UTM E (X)	
22. UTM N (Y)	
Day 1.	23. **to Plot:** _____
24. Date [dd/mm/yy]	
25. Leaving Vehicle time	: h
26. Bearing to Plot [deg]	
27. Distance to Plot [km]	
28. Vehicle return time	: h
Day 2.	29. **to Plot:** _____
30. Date [dd/mm/yy]	: h
31. Leaving Vehicle time	: h
32. Bearing to Plot	
33. Distance to Plot [km]	
34. Vehicle return time	: h

35. **Remarks**

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G. Follow up raw data	
Raw data delivered by	
Raw data delivered to	
Raw data delivered on date [dd/mm/yy]	

H. Follow up data		**Date** [dd/mm/yy]
Data controlled by		
Data entered by		
Data validated by		

1. **Cluster Number**	

2. **Plot Number**	

A. Time record		
Day 1	**Day 1**	**Day 2** (if needed)
3. Date [dd/mm/yy]		
4. Arrival time	:	:
5. Time to locate the old Marker		*minutes*
6. End time	:	:
B. Plot Marker point GPS Reading	(same as starting point, if possible)	
7. UTM-E (X)		
8. UTM-N (Y)		

9. Old Marker found? [Y/N]	
10. New Marker installed? [Y/N]	
11. Marker at starting point? [Y/N]	
12. Bearing from Marker to Plot starting point [deg]	
13. Distance from Marker to Plot starting point [m]	

C. Plot accessibility and slope data	
14. Slope along plot axis [%]	
15. Slope [%]	
16. Slope bearing [deg]	

17. **Remarks**

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E. Plot plan and sketch map

Central line bearing:

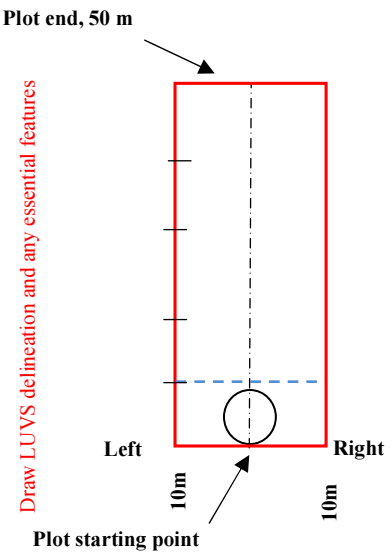
Plot # 1 = 0° Plot # 2 = 90°

Plot # 3 = 180° Plot # 4 = 270°

25. **Plot end point GPS reading**

UTM-E (X) _ _ _ _ _ _ _ _ _ _ _ m

UTM-N (Y) _ _ _ _ _ _ _ _ _ _ _ _ m



—— LV (Land cover/Vegetation type limit)

- - - Rd1 (Paved road)
Rd2 (Primary road unpaved)
Rd3 (Secondary road)
Rd4 (Track)

_ · _ W1 (Perennial stream)
W2 (Intermittent stream)

D. Plot marker's reference point data						
From Reference object to Marker		19. **Bearing** [deg]	20. **Distance** [m]	21. **DBH** [cm] *for trees*	22. **ID Photo**	23. **Remarks**
ID	18. **Type of object** (if tree then give species)					
R1						
R2						
R3						
R4						

ID	24. **Reference point GPS readings**. These are recorded **only** if Marker point coordinates cannot be measured	
	UTM-E (X)	UTM-N (Y)
	UTM-E (X)	UTM-N (Y)

1. Cluster Number		2. Plot Number	

A. Land use/Vegetation type section (LUVS) (Take a photo of each new section)

3. Section	4. Land use/ Vegetation type	5. Accessibility	6a. width (m)	6b. length (m)	7. Designation/ protection status	8. Fire Occurrence	9. Fire Area	10. Fire type*	11. Environ Problems*			12. Intensity of Env Prob*			13. Grazing intensity	14. Livestock management*
A																
B																
C																
D																

B. Forest and other wooded land management and structure

	N	P	C	nk
15. Stand origin*				

16. Planting year

17. Stand structure

18. Canopy Cover:

	N	E	S	W
10 m				
25 m				
40 m				

19. Undergrowth

20. Shrub coverage

21. Tree/forest proposal

22. Disturbance

23.Timber extraction*		
	0	No felling
	1	Clear cutting
	2	Seed tree cutting
	3	Single tree selective cutting
	4	Group felling
	5	Strip felling
	6	Not known
	99	Other:

24.Silviculture*		
	0	No silvicultural practice
	1	Pruning
	2	Thinning
	3	Coppicing
	4	Pollarding
	5	Enrichment planting indig.
	6	Enrichment planting exotic
	7	Cleaning/weeding
	8	Sanitary cutting
	9	Prescribed burning
	10	Fire break
	99	Other:

C. Crop production/management

25.Cropping System*		
	1	Multiple cropping
	2	Improved cultivars
	3	Crop rotation
	4	Fallow
	5	Monoculture
	6	Mixed cropping
	7	Intercropping
	8	Mixed crop/livestock
	9	Agroforestry
	10	Shifting cultivation
	90	Not known
	99	Other:

26. Current and recent crops*
99. Other:

27. Soil & water conservation*		
	0	None
	1	Levelling
	2	Contour farming
	3	Terracing
	4	Crop residue incorporation
	5	Cover crops/vegetation
	6	Mulching
	7	Windbreak
	8	Grassed waterway
	9	Tree planting/Agroforestry
	90	Not known
	99	Other:

28. Nutrient application*		
	0	None
	1	Adequate fallow
	2	Organic fertilizer
	3	Mineral fertilizer
	4	Liming
	90	Not known
	99	Other:

D. In the plot

29. Ownership	
30. Recent change in land tenure? [Y/N/NA]	
31. If YES, past ownership (code):	
32. Presence of a formal management plan [Y/N/NA]	
33. Seasonality	

34. Grass biomass. Disc Pasture Meter.			
1		6	
2		7	
3		8	
4		9	
5		10	

35. Biodiversity*	36. Biodiversity status*	37. Remarks

Forest Products /Services*					
	38. Forest and tree prod/services code	39.Rank	40. Species	41. User rights	42. Remarks on FP/S
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					

43. Remarks

*multiple choice

1. **Cluster Number**	

2. **Plot Number**	

3. LUVS code _____

REGENERATION, SHRUBS (DBH < 5 cm, live seedlings, saplings, shrubs. Tick count.)
Plot radius = 4.99 m

#	4. **Species name**	5. **Language** [code]	6. **Number of similar seedlings/ saplings**					
			DBH class [cm]					
			<1.3m 0	**≥1.3m and d<1**	**1–1.9**	**2–2.9**	**3–3.9**	**4–4.9**
1								
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22								

Language: B= Bemba, N= Nyanja, K= Kaonde, L= Lozi, T= Tonga, Lu= Lunda, Lve=Luvale

7. **Remarks**

_____

_____

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_____

1. **Cluster Number**	

2. **Plot Number**	

Trees 5 cm ≤ DBH <10 cm are recorded in 20 m X 10 m subplot.

3. **LUVS** [code]	4. **Tree No.**	5. **ILUA I Tree No.**	6. **Species name**	7. **Language** [code]	8. **Location along plot axis** [m]	**Location** 9. **Left** [m]	10. **Right** [m]	11. **DBH** [cm]	12. **Height of DBH** (if not 1.3m) [m]	13. **Bole height** [m]	14. Use	15. Quality	16. Health	17. Caus. agent	18. Severity	19. Origin	20. **Top Height** [m]
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1. **Cluster Number**	

2. **Plot Number**	

Trees 5 cm ≤ DBH <10 cm are recorded in 20 m X 10 m subplot.

3. **LUVS** [code]	4. **Tree No.**	5. **ILUA I Tree No.**	6. **Species name**	7. **Language** [code]	8. **Location along plot axis** [m]	**Location** 9. **Left** [m]	10. **Right** [m]	11. **DBH** [cm]	12. **Height of DBH** (if not 1.3m) [m]	13. **Bole height** [m]	14. Use	15. Quality	16. Health	17. Caus. agent	18. Severity	19. Origin	20. **Top Height** [m]
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1. **Cluster Number**	

2. **Plot Number**	

Trees DBH ≥ 10 cm are recorded in 20 m X 50 m plot.

3. **LUVS** [code]	4. **Tree No.**	5. **ILUA I Tree No.**	6. **Species name**	7. **Language** [code]	8. **Location along plot axis** [m]	**Location** 9. **Left** [m]	10. **Right** [m]	11. **DBH** [cm]	12. **Height of DBH** (if not 1.3m) [m]	13. **Bole height** [m]	14. **Use**	15. **Quality**	16. **Health**	17. **Caus. agent**	18. **Severity**	19. **Origin**	20. **Top Height** [m]
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1. **Cluster Number**	

2. **Plot Number**	

Trees DBH ≥ 10 cm are recorded in 20 m X 50 m plot.

3. **LUVS** [code]	4. **Tree No.**	5. **ILUA I Tree No.**	6. **Species name**	7. **Language** [code]	8. **Location along plot axis** [m]	**Location** 9. **Left** [m]	10. **Right** [m]	11. **DBH** [cm]	12. **Height of DBH** (if not 1.3m) [m]	13. **Bole height** [m]	14. **Use**	15. **Quality**	16. **Health**	17. **Caus. agent**	18. **Severity**	19. **Origin**	20. **Top Height** [m]
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Language: B= Bemba, N= Nyanja, K= Kaonde, L= Lozi, T= Tonga, Lu= Lunda, Lve=Luvale

1. **Cluster Number**	

2. **Plot Number**	

Trees DBH ≥ 10 cm are recorded in 20 m X 50 m plot.

3. **LUVS** [code]	4. **Tree No.**	5. **ILUA I Tree No.**	6. **Species name**	7. **Language** [code]	8. **Location along plot axis** [m]	**Location** 9. **Left** [m]	10. **Right** [m]	11. **DBH** [cm]	12. **Height of DBH** (if not 1.3m) [m]	13. **Bole height** [m]	14. **Use**	15. **Quality**	16. **Health**	17. **Caus. agent**	18. **Severity**	19. **Origin**	20. **Top Height** [m]
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1. **Cluster Number**	

2. **Plot Number**	

A. **STUMPS** (diameter ≥ 10 cm). Measure over bark

*Plot size: 20 m X 50 m – **NOTE THAT STUMP DATA IS COLLECTED OVER THE ENTIRE PLOT LENGTH***

#	3. **LVS code**	4. **Species name**	5. **Lang** [code]	**Location**		8. **Diam.** [cm]	9. **Ht** [cm]	10. **Years** [code]
				6. left (m)	**7. right** (m)			
1								
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17								
18								
19								

Language: B= Bemba, N= Nyanja, K= Kaonde, L= Lozi, T= Tonga, Lu= Lunda, Lve=Luvale

B. **FALLEN DEADWOOD** (diameter ≥ 10 cm)

*Plot size: 20 m X 50 m – **NOTE THAT DATA ON FALLEN DEADWOOD IS COLLECTED OVER THE ENTIRE PLOT LENGTH***

#	11. **LVS code**	12. **Species name**	13. **Lang.** [code]	14. **Diam1** [cm]	15. **Diam2** [cm]	16. Length [m]	17. Count similar parts	18. **Decay** [code]
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								

Decay: S=Solid, R=fully/partially rotten

1. **Cluster Number**	

2. **Plot Number**	

A. **STUMPS** (diameter ≥ 10 cm). Measure over bark

*Plot size: 20 m X 50 m – **NOTE THAT STUMP DATA IS COLLECTED OVER THE ENTIRE PLOT LENGTH***

#	3. **LVS code**	4. **Species name**	5. **Lang** [code]	**Location**		8. **Diam.** [cm]	9. **Ht** [cm]	10. **Years** [code]
				6. left (m)	**7. right** (m)			
1								
2								
3								
4								
5								
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17								
18								
19								

Language: B= Bemba, N= Nyanja, K= Kaonde, L= Lozi, T= Tonga, Lu= Lunda, Lve=Luvale

B. **FALLEN DEADWOOD** (diameter ≥ 10 cm)

*Plot size: 20 m X 50 m – **NOTE THAT DATA ON FALLEN DEADWOOD IS COLLECTED OVER THE ENTIRE PLOT LENGTH***

#	11. **LVS code**	12. **Species name**	13. **Lang.** [code]	14. **Diam1** [cm]	15. **Diam2** [cm]	16. Length [m]	17. Count similar parts	18. **Decay** [code]
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12								
13								
14								
15								
16								
17								
18								
19								

Decay: S=Solid, R=fully/partially rotten

1. **Cluster Number**	

2. **Plot Number**	

BAMBOO (diameter ≥ 5 cm)

Plot size: 20 m X 25 m

#	3. **LUVS code**	4. **Species name**	5. **Langu-age** [code]	6. **Status** **A**=Alive **D**=Dead	7.**Average Diameter** [cm]	8.**Average height** [0.5 m]	9. **Number of stems in clump**
1						.	
2						.	
3						.	
4						.	
5						.	
6						.	
7						.	
8						.	
9						.	
10						.	
11						.	
12						.	
13						.	
14						.	
15						.	
16						.	
17						.	
18						.	
19						.	
20						.	

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1. **Cluster Number**	

2. **Plot Number**	

A. Time record		
Day 1	**Day 1**	**Day 2** (if needed)
3. Date [dd/mm/yy]		
4. Arrival time	:	:
5. Time to locate the old Marker		*minutes*
6. End time	:	:
B. Plot Marker point GPS Reading	(same as starting point, if possible)	
7. UTM-E (X)		
8. UTM-N (Y)		

9. Old Marker found? [Y/N]	
10. New Marker installed? [Y/N]	
11. Marker at starting point? [Y/N]	
12. Bearing from Marker to Plot starting point [deg]	
13. Distance from Marker to Plot starting point [m]	

C. Plot accessibility and slope data	
14. Slope along plot axis [%]	
15. Slope [%]	
16. Slope bearing [deg]	

17. **Remarks**

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.....

.....

E. Plot plan and sketch map

Central line bearing:

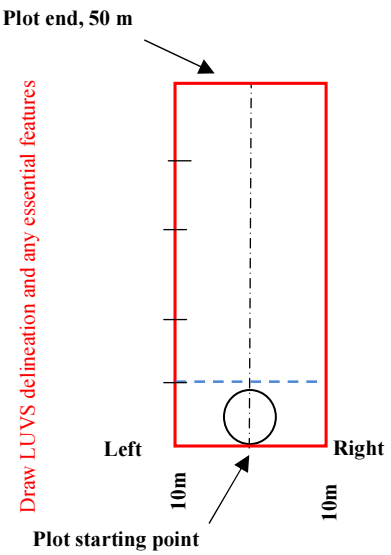
Plot # 1 = 0° Plot # 2 = 90°

Plot # 3 = 180° Plot # 4 = 270°

25. **Plot end point GPS reading**

UTM-E (X) _ _ _ _ _ _ _ _ _ _ _ m

UTM-N (Y) _ _ _ _ _ _ _ _ _ _ _ _ m



—— LV (Land cover/Vegetation type limit)

- - - Rd1 (Paved road)
Rd2 (Primary road unpaved)
Rd3 (Secondary road)
Rd4 (Track)

_ · _ W1 (Perennial stream)
W2 (Intermittent stream)

D. Plot marker's reference point data						
From Reference object to Marker		19. **Bearing** [deg]	20. **Distance** [m]	21. **DBH** [cm] *for trees*	22. **ID Photo**	23. **Remarks**
ID	18. **Type of object** (if tree then give species)					
R1						
R2						
R3						
R4						

ID	24. **Reference point GPS readings**. These are recorded **only** if Marker point coordinates cannot be measured	
	UTM-E (X)	UTM-N (Y)
	UTM-E (X)	UTM-N (Y)

1. Cluster Number		2. Plot Number	

A. Land use/Vegetation type section (LUVS) (Take a photo of each new section)

3. Section	4. Land use/ Vegetation type	5. Accessibility	6a. width (m)	6b. length (m)	7. Designation/ protection status	8. Fire Occurrence	9. Fire Area	10. Fire type*	11. Environ Problems*			12. Intensity of Env Prob*			13. Grazing intensity	14. Livestock management*
A																
B																
C																
D																

B. Forest and other wooded land management and structure

	N	P	C	nk
15. Stand origin*				

16. Planting year

17. Stand structure

18. Canopy Cover:

	N	E	S	W
10 m				
25 m				
40 m				

19. Undergrowth

20. Shrub coverage

21. Tree/forest proposal

22. Disturbance

23.Timber extraction*		
	0	No felling
	1	Clear cutting
	2	Seed tree cutting
	3	Single tree selective cutting
	4	Group felling
	5	Strip felling
	6	Not known
	99	Other:

24.Silviculture*		
	0	No silvicultural practice
	1	Pruning
	2	Thinning
	3	Coppicing
	4	Pollarding
	5	Enrichment planting indig.
	6	Enrichment planting exotic
	7	Cleaning/weeding
	8	Sanitary cutting
	9	Prescribed burning
	10	Fire break
	99	Other:

C. Crop production/management

25.Cropping System*		
	1	Multiple cropping
	2	Improved cultivars
	3	Crop rotation
	4	Fallow
	5	Monoculture
	6	Mixed cropping
	7	Intercropping
	8	Mixed crop/livestock
	9	Agroforestry
	10	Shifting cultivation
	90	Not known
	99	Other:

26. Current and recent crops*
99. Other:

27. Soil & water conservation*		
	0	None
	1	Levelling
	2	Contour farming
	3	Terracing
	4	Crop residue incorporation
	5	Cover crops/vegetation
	6	Mulching
	7	Windbreak
	8	Grassed waterway
	9	Tree planting/Agroforestry
	90	Not known
	99	Other:

28. Nutrient application*		
	0	None
	1	Adequate fallow
	2	Organic fertilizer
	3	Mineral fertilizer
	4	Liming
	90	Not known
	99	Other:

D. In the plot

29. Ownership	
30. Recent change in land tenure? [Y/N/NA]	
31. If YES, past ownership (code):	
32. Presence of a formal management plan [Y/N/NA]	
33. Seasonality	

34. Grass biomass. Disc Pasture Meter.			
1		6	
2		7	
3		8	
4		9	
5		10	

35. Biodiversity*	36. Biodiversity status*	37. Remarks

Forest Products /Services*					
	38. Forest and tree prod/services code	39.Rank	40. Species	41. User rights	42. Remarks on FP/S
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					

43. Remarks

*multiple choice

1. **Cluster Number**	

2. **Plot Number**	

3. LUVS code _____

REGENERATION, SHRUBS (DBH < 5 cm, live seedlings, saplings, shrubs. Tick count.)
Plot radius = 4.99 m

#	4. **Species name**	5. **Language** [code]	6. **Number of similar seedlings/ saplings**					
			DBH class [cm]					
			<1.3m 0	**≥1.3m and d<1**	**1–1.9**	**2–2.9**	**3–3.9**	**4–4.9**
1								
2								
3								
4								
5								
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8								
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10								
11								
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15								
16								
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19								
20								
21								
22								

Language: B= Bemba, N= Nyanja, K= Kaonde, L= Lozi, T= Tonga, Lu= Lunda, Lve=Luvale

7. **Remarks**

_____

_____

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1. **Cluster Number**	

2. **Plot Number**	

Trees 5 cm ≤ DBH <10 cm are recorded in 20 m X 10 m subplot.

3. **LUVS** [code]	4. **Tree No.**	5. **ILUA I Tree No.**	6. **Species name**	7. **Language** [code]	8. **Location along plot axis** [m]	**Location** 9. **Left** [m]	10. **Right** [m]	11. **DBH** [cm]	12. **Height of DBH** (if not 1.3m) [m]	13. **Bole height** [m]	14. Use	15. Quality	16. Health	17. Caus. agent	18. Severity	19. Origin	20. **Top Height** [m]
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Language: B= Bemba, N= Nyanja, K= Kaonde, L= Lozi, T= Tonga, Lu= Lunda, Lve=Luvale

1. **Cluster Number**	

2. **Plot Number**	

Trees 5 cm ≤ DBH <10 cm are recorded in 20 m X 10 m subplot.

3. **LUVS** [code]	4. **Tree No.**	5. **ILUA I Tree No.**	6. **Species name**	7. **Language** [code]	8. **Location along plot axis** [m]	**Location** 9. **Left** [m]	10. **Right** [m]	11. **DBH** [cm]	12. **Height of DBH** (if not 1.3m) [m]	13. **Bole height** [m]	14. Use	15. Quality	16. Health	17. Caus. agent	18. Severity	19. Origin	20. **Top Height** [m]
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Language: B= Bemba, N= Nyanja, K= Kaonde, L= Lozi, T= Tonga, Lu= Lunda, Lve=Luvale

1. **Cluster Number**	

2. **Plot Number**	

Trees DBH ≥ 10 cm are recorded in 20 m X 50 m plot.

3. **LUVS** [code]	4. **Tree No.**	5. **ILUA I Tree No.**	6. **Species name**	7. **Language** [code]	8. **Location along plot axis** [m]	**Location** 9. **Left** [m]	10. **Right** [m]	11. **DBH** [cm]	12. **Height of DBH** (if not 1.3m) [m]	13. **Bole height** [m]	14. **Use**	15. **Quality**	16. **Health**	17. **Caus. agent**	18. **Severity**	19. **Origin**	20. **Top Height** [m]
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Language: B= Bemba, N= Nyanja, K= Kaonde, L= Lozi, T= Tonga, Lu= Lunda, Lve=Luvale

1. **Cluster Number**	

2. **Plot Number**	

Trees DBH ≥ 10 cm are recorded in 20 m X 50 m plot.

3. **LUVS** [code]	4. **Tree No.**	5. **ILUA I Tree No.**	6. **Species name**	7. **Language** [code]	8. **Location along plot axis** [m]	**Location** 9. **Left** [m]	10. **Right** [m]	11. **DBH** [cm]	12. **Height of DBH** (if not 1.3m) [m]	13. **Bole height** [m]	14. **Use**	15. **Quality**	16. **Health**	17. **Caus. agent**	18. **Severity**	19. **Origin**	20. **Top Height** [m]
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Language: B= Bemba, N= Nyanja, K= Kaonde, L= Lozi, T= Tonga, Lu= Lunda, Lve=Luvale

1. **Cluster Number**	

2. **Plot Number**	

Trees DBH ≥ 10 cm are recorded in 20 m X 50 m plot.

3. **LUVS** [code]	4. **Tree No.**	5. **ILUA I Tree No.**	6. **Species name**	7. **Language** [code]	8. **Location along plot axis** [m]	**Location** 9. **Left** [m]	10. **Right** [m]	11. **DBH** [cm]	12. **Height of DBH** (if not 1.3m) [m]	13. **Bole height** [m]	14. **Use**	15. **Quality**	16. **Health**	17. **Caus. agent**	18. **Severity**	19. **Origin**	20. **Top Height** [m]
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Language: B= Bemba, N= Nyanja, K= Kaonde, L= Lozi, T= Tonga, Lu= Lunda, Lve=Luvale

1. **Cluster Number**	

2. **Plot Number**	

A. **STUMPS** (diameter ≥ 10 cm). Measure over bark

*Plot size: 20 m X 50 m – **NOTE THAT STUMP DATA IS COLLECTED OVER THE ENTIRE PLOT LENGTH***

#	3. **LVS code**	4. **Species name**	5. **Lang** [code]	**Location**		8. **Diam.** [cm]	9. **Ht** [cm]	10. **Years** [code]
				6. left (m)	**7. right** (m)			
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17								
18								
19								

Language: B= Bemba, N= Nyanja, K= Kaonde, L= Lozi, T= Tonga, Lu= Lunda, Lve=Luvale

B. **FALLEN DEADWOOD** (diameter ≥ 10 cm)

*Plot size: 20 m X 50 m – **NOTE THAT DATA ON FALLEN DEADWOOD IS COLLECTED OVER THE ENTIRE PLOT LENGTH***

#	11. **LVS code**	12. **Species name**	13. **Lang.** [code]	14. **Diam1** [cm]	15. **Diam2** [cm]	16. Length [m]	17. Count similar parts	18. **Decay** [code]
1								
2								
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4								
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9								
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13								
14								
15								
16								
17								
18								
19								

Decay: S=Solid, R=fully/partially rotten

1. **Cluster Number**	

2. **Plot Number**	

A. **STUMPS** (diameter ≥ 10 cm). Measure over bark

*Plot size: 20 m X 50 m – **NOTE THAT STUMP DATA IS COLLECTED OVER THE ENTIRE PLOT LENGTH***

#	3. **LVS code**	4. **Species name**	5. **Lang** [code]	**Location**		8. **Diam.** [cm]	9. **Ht** [cm]	10. **Years** [code]
				6. left (m)	**7. right** (m)			
1								
2								
3								
4								
5								
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7								
8								
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18								
19								

Language: B= Bemba, N= Nyanja, K= Kaonde, L= Lozi, T= Tonga, Lu= Lunda, Lve=Luvale

B. **FALLEN DEADWOOD** (diameter ≥ 10 cm)

*Plot size: 20 m X 50 m – **NOTE THAT DATA ON FALLEN DEADWOOD IS COLLECTED OVER THE ENTIRE PLOT LENGTH***

#	11. **LVS code**	12. **Species name**	13. **Lang.** [code]	14. **Diam1** [cm]	15. **Diam2** [cm]	16. Length [m]	17. Count similar parts	18. **Decay** [code]
1								
2								
3								
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5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								

Decay: S=Solid, R=fully/partially rotten

1. **Cluster Number**	

2. **Plot Number**	

BAMBOO (diameter ≥ 5 cm)

Plot size: 20 m X 25 m

#	3. **LUVS code**	4. **Species name**	5. **Langu-age** [code]	6. **Status** **A**=Alive **D**=Dead	7.**Average Diameter** [cm]	8.**Average height** [0.5 m]	9. **Number of stems in clump**
1						.	
2						.	
3						.	
4						.	
5						.	
6						.	
7						.	
8						.	
9						.	
10						.	
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12						.	
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15						.	
16						.	
17						.	
18						.	
19						.	
20						.	

Language: B= Bemba, N= Nyanja, K= Kaonde, L= Lozi, T= Tonga, Lu= Lunda, Lve=Luvale

1. **Cluster Number**	

2. **Plot Number**	

A. Time record		
Day 1	**Day 1**	**Day 2** (if needed)
3. Date [dd/mm/yy]		
4. Arrival time	:	:
5. Time to locate the old Marker		*minutes*
6. End time	:	:
B. Plot Marker point GPS Reading	(same as starting point, if possible)	
7. UTM-E (X)		
8. UTM-N (Y)		

9. Old Marker found? [Y/N]	
10. New Marker installed? [Y/N]	
11. Marker at starting point? [Y/N]	
12. Bearing from Marker to Plot starting point [deg]	
13. Distance from Marker to Plot starting point [m]	

C. Plot accessibility and slope data	
14. Slope along plot axis [%]	
15. Slope [%]	
16. Slope bearing [deg]	

17. **Remarks**

.....

.....

.....

E. Plot plan and sketch map

Central line bearing:

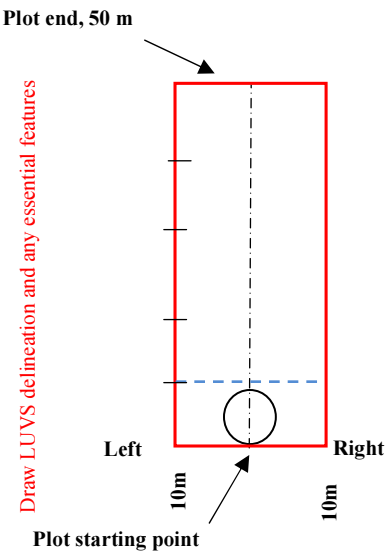
Plot # 1 = 0° Plot # 2 = 90°

Plot # 3 = 180° Plot # 4 = 270°

25. **Plot end point GPS reading**

UTM-E (X) _ _ _ _ _ _ _ _ _ _ _ m

UTM-N (Y) _ _ _ _ _ _ _ _ _ _ _ _ m



—— LV (Land cover/Vegetation type limit)

- - - Rd1 (Paved road)
Rd2 (Primary road unpaved)
Rd3 (Secondary road)
Rd4 (Track)

_ · _ W1 (Perennial stream)
W2 (Intermittent stream)

D. Plot marker's reference point data						
From Reference object to Marker		19. **Bearing** [deg]	20. **Distance** [m]	21. **DBH** [cm] *for trees*	22. **ID Photo**	23. **Remarks**
ID	18. **Type of object** (if tree then give species)					
R1						
R2						
R3						
R4						

ID	24. **Reference point GPS readings**. These are recorded **only** if Marker point coordinates cannot be measured	
	UTM-E (X)	UTM-N (Y)
	UTM-E (X)	UTM-N (Y)

1. Cluster Number		2. Plot Number	

A. Land use/Vegetation type section (LUVS) (Take a photo of each new section)

3. Section	4. Land use/ Vegetation type	5. Accessibility	6a. width (m)	6b. length (m)	7. Designation/ protection status	8. Fire Occurrence	9. Fire Area	10. Fire type*	11. Environ Problems*			12. Intensity of Env Prob*			13. Grazing intensity	14. Livestock management*
A																
B																
C																
D																

B. Forest and other wooded land management and structure

	N	P	C	nk
15. Stand origin*				

16. Planting year

17. Stand structure

18. Canopy Cover:

	N	E	S	W
10 m				
25 m				
40 m				

19. Undergrowth

20. Shrub coverage

21. Tree/forest proposal

22. Disturbance

23.Timber extraction*		
	0	No felling
	1	Clear cutting
	2	Seed tree cutting
	3	Single tree selective cutting
	4	Group felling
	5	Strip felling
	6	Not known
	99	Other:

24.Silviculture*		
	0	No silvicultural practice
	1	Pruning
	2	Thinning
	3	Coppicing
	4	Pollarding
	5	Enrichment planting indig.
	6	Enrichment planting exotic
	7	Cleaning/weeding
	8	Sanitary cutting
	9	Prescribed burning
	10	Fire break
	99	Other:

C. Crop production/management

25.Cropping System*		
	1	Multiple cropping
	2	Improved cultivars
	3	Crop rotation
	4	Fallow
	5	Monoculture
	6	Mixed cropping
	7	Intercropping
	8	Mixed crop/livestock
	9	Agroforestry
	10	Shifting cultivation
	90	Not known
	99	Other:

26. Current and recent crops*
99. Other:

27. Soil & water conservation*		
	0	None
	1	Levelling
	2	Contour farming
	3	Terracing
	4	Crop residue incorporation
	5	Cover crops/vegetation
	6	Mulching
	7	Windbreak
	8	Grassed waterway
	9	Tree planting/Agroforestry
	90	Not known
	99	Other:

28. Nutrient application*		
	0	None
	1	Adequate fallow
	2	Organic fertilizer
	3	Mineral fertilizer
	4	Liming
	90	Not known
	99	Other:

D. In the plot

29. Ownership	
30. Recent change in land tenure? [Y/N/NA]	
31. If YES, past ownership (code):	
32. Presence of a formal management plan [Y/N/NA]	
33. Seasonality	

34. Grass biomass. Disc Pasture Meter.			
1		6	
2		7	
3		8	
4		9	
5		10	

35. Biodiversity*	36. Biodiversity status*	37. Remarks

Forest Products /Services*					
	38. Forest and tree prod/services code	39.Rank	40. Species	41. User rights	42. Remarks on FP/S
1					
2					
3					
4					
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6					
7					
8					
9					
10					

43. Remarks

*multiple choice

1. **Cluster Number**	

2. **Plot Number**	

3. LUVS code _____

REGENERATION, SHRUBS (DBH < 5 cm, live seedlings, saplings, shrubs. Tick count.)
Plot radius = 4.99 m

#	4. **Species name**	5. **Language** [code]	6. **Number of similar seedlings/ saplings**					
			DBH class [cm]					
			<1.3m 0	**≥1.3m and d<1**	**1–1.9**	**2–2.9**	**3–3.9**	**4–4.9**
1								
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Language: B= Bemba, N= Nyanja, K= Kaonde, L= Lozi, T= Tonga, Lu= Lunda, Lve=Luvale

7. **Remarks**

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1. **Cluster Number**	

2. **Plot Number**	

Trees 5 cm ≤ DBH <10 cm are recorded in 20 m X 10 m subplot.

3. **LUVS** [code]	4. **Tree No.**	5. **ILUA I Tree No.**	6. **Species name**	7. **Language** [code]	8. **Location along plot axis** [m]	**Location** 9. **Left** [m]	10. **Right** [m]	11. **DBH** [cm]	12. **Height of DBH** (if not 1.3m) [m]	13. **Bole height** [m]	14. Use	15. Quality	16. Health	17. Caus. agent	18. Severity	19. Origin	20. **Top Height** [m]
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Language: B= Bemba, N= Nyanja, K= Kaonde, L= Lozi, T= Tonga, Lu= Lunda, Lve=Luvale

1. **Cluster Number**	

2. **Plot Number**	

Trees 5 cm ≤ DBH <10 cm are recorded in 20 m X 10 m subplot.

3. **LUVS** [code]	4. **Tree No.**	5. **ILUA I Tree No.**	6. **Species name**	7. **Language** [code]	8. **Location along plot axis** [m]	**Location** 9. **Left** [m]	10. **Right** [m]	11. **DBH** [cm]	12. **Height of DBH** (if not 1.3m) [m]	13. **Bole height** [m]	14. Use	15. Quality	16. Health	17. Caus. agent	18. Severity	19. Origin	20. **Top Height** [m]
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Language: B= Bemba, N= Nyanja, K= Kaonde, L= Lozi, T= Tonga, Lu= Lunda, Lve=Luvale

1. **Cluster Number**	

2. **Plot Number**	

Trees DBH ≥ 10 cm are recorded in 20 m X 50 m plot.

3. **LUVS** [code]	4. **Tree No.**	5. **ILUA I Tree No.**	6. **Species name**	7. **Language** [code]	8. **Location along plot axis** [m]	**Location** 9. **Left** [m]	10. **Right** [m]	11. **DBH** [cm]	12. **Height of DBH** (if not 1.3m) [m]	13. **Bole height** [m]	14. **Use**	15. **Quality**	16. **Health**	17. **Caus. agent**	18. **Severity**	19. **Origin**	20. **Top Height** [m]
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Language: B= Bemba, N= Nyanja, K= Kaonde, L= Lozi, T= Tonga, Lu= Lunda, Lve=Luvale

1. **Cluster Number**	

2. **Plot Number**	

Trees DBH ≥ 10 cm are recorded in 20 m X 50 m plot.

3. **LUVS** [code]	4. **Tree No.**	5. **ILUA I Tree No.**	6. **Species name**	7. **Language** [code]	8. **Location along plot axis** [m]	**Location** 9. **Left** [m]	10. **Right** [m]	11. **DBH** [cm]	12. **Height of DBH** (if not 1.3m) [m]	13. **Bole height** [m]	14. **Use**	15. **Quality**	16. **Health**	17. **Caus. agent**	18. **Severity**	19. **Origin**	20. **Top Height** [m]
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Language: B= Bemba, N= Nyanja, K= Kaonde, L= Lozi, T= Tonga, Lu= Lunda, Lve=Luvale

1. **Cluster Number**	

2. **Plot Number**	

Trees DBH ≥ 10 cm are recorded in 20 m X 50 m plot.

3. **LUVS** [code]	4. **Tree No.**	5. **ILUA I Tree No.**	6. **Species name**	7. **Language** [code]	8. **Location along plot axis** [m]	**Location** 9. **Left** [m]	10. **Right** [m]	11. **DBH** [cm]	12. **Height of DBH** (if not 1.3m) [m]	13. **Bole height** [m]	14. **Use**	15. **Quality**	16. **Health**	17. **Caus. agent**	18. **Severity**	19. **Origin**	20. **Top Height** [m]
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Language: B= Bemba, N= Nyanja, K= Kaonde, L= Lozi, T= Tonga, Lu= Lunda, Lve=Luvale

1. **Cluster Number**	

2. **Plot Number**	

A. **STUMPS** (diameter ≥ 10 cm). Measure over bark

*Plot size: 20 m X 50 m – **NOTE THAT STUMP DATA IS COLLECTED OVER THE ENTIRE PLOT LENGTH***

#	3. **LVS code**	4. **Species name**	5. **Lang** [code]	**Location**		8. **Diam.** [cm]	9. **Ht** [cm]	10. **Years** [code]
				6. left (m)	**7. right** (m)			
1								
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18								
19								

Language: B= Bemba, N= Nyanja, K= Kaonde, L= Lozi, T= Tonga, Lu= Lunda, Lve=Luvale

B. **FALLEN DEADWOOD** (diameter ≥ 10 cm)

*Plot size: 20 m X 50 m – **NOTE THAT DATA ON FALLEN DEADWOOD IS COLLECTED OVER THE ENTIRE PLOT LENGTH***

#	11. **LVS code**	12. **Species name**	13. **Lang.** [code]	14. **Diam1** [cm]	15. **Diam2** [cm]	16. Length [m]	17. Count similar parts	18. **Decay** [code]
1								
2								
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9								
10								
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12								
13								
14								
15								
16								
17								
18								
19								

Decay: S=Solid, R=fully/partially rotten

1. **Cluster Number**	

2. **Plot Number**	

A. **STUMPS** (diameter ≥ 10 cm). Measure over bark

*Plot size: 20 m X 50 m – **NOTE THAT STUMP DATA IS COLLECTED OVER THE ENTIRE PLOT LENGTH***

#	3. **LVS code**	4. **Species name**	5. **Lang** [code]	**Location**		8. **Diam.** [cm]	9. **Ht** [cm]	10. **Years** [code]
				6. left (m)	**7. right** (m)			
1								
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17								
18								
19								

Language: B= Bemba, N= Nyanja, K= Kaonde, L= Lozi, T= Tonga, Lu= Lunda, Lve=Luvale

B. **FALLEN DEADWOOD** (diameter ≥ 10 cm)

*Plot size: 20 m X 50 m – **NOTE THAT DATA ON FALLEN DEADWOOD IS COLLECTED OVER THE ENTIRE PLOT LENGTH***

#	11. **LVS code**	12. **Species name**	13. **Lang.** [code]	14. **Diam1** [cm]	15. **Diam2** [cm]	16. Length [m]	17. Count similar parts	18. **Decay** [code]
1								
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9								
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12								
13								
14								
15								
16								
17								
18								
19								

Decay: S=Solid, R=fully/partially rotten

1. **Cluster Number**	

2. **Plot Number**	

BAMBOO (diameter ≥ 5 cm)

Plot size: 20 m X 25 m

#	3. **LUVS code**	4. **Species name**	5. **Langu-age** [code]	6. **Status** **A**=Alive **D**=Dead	7.**Average Diameter** [cm]	8.**Average height** [0.5 m]	9. **Number of stems in clump**
1						.	
2						.	
3						.	
4						.	
5						.	
6						.	
7						.	
8						.	
9						.	
10						.	
11						.	
12						.	
13						.	
14						.	
15						.	
16						.	
17						.	
18						.	
19						.	
20						.	

Language: B= Bemba, N= Nyanja, K= Kaonde, L= Lozi, T= Tonga, Lu= Lunda, Lve=Luvale

1. **Cluster Number**	

2. **Plot Number**	

A. Time record		
Day 1	**Day 1**	**Day 2** (if needed)
3. Date [dd/mm/yy]		
4. Arrival time	:	:
5. Time to locate the old Marker		*minutes*
6. End time	:	:
B. Plot Marker point GPS Reading	(same as starting point, if possible)	
7. UTM-E (X)		
8. UTM-N (Y)		

9. Old Marker found? [Y/N]	
10. New Marker installed? [Y/N]	
11. Marker at starting point? [Y/N]	
12. Bearing from Marker to Plot starting point [deg]	
13. Distance from Marker to Plot starting point [m]	

C. Plot accessibility and slope data	
14. Slope along plot axis [%]	
15. Slope [%]	
16. Slope bearing [deg]	

17. **Remarks**

.....

.....

.....

E. Plot plan and sketch map

Central line bearing:

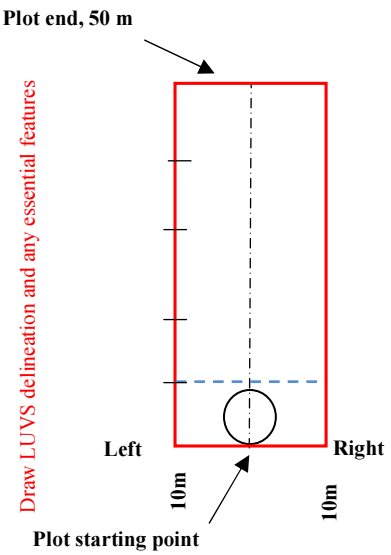
Plot # 1 = 0° Plot # 2 = 90°

Plot # 3 = 180° Plot # 4 = 270°

25. **Plot end point GPS reading**

UTM-E (X) _ _ _ _ _ _ _ _ _ _ _ m

UTM-N (Y) _ _ _ _ _ _ _ _ _ _ _ _ m



—— LV (Land cover/Vegetation type limit)

- - - Rd1 (Paved road)
Rd2 (Primary road unpaved)
Rd3 (Secondary road)
Rd4 (Track)

_ · _ W1 (Perennial stream)
W2 (Intermittent stream)

D. Plot marker's reference point data						
From Reference object to Marker		19. **Bearing** [deg]	20. **Distance** [m]	21. **DBH** [cm] *for trees*	22. **ID Photo**	23. **Remarks**
ID	18. **Type of object** (if tree then give species)					
R1						
R2						
R3						
R4						

ID	24. **Reference point GPS readings**. These are recorded **only** if Marker point coordinates cannot be measured	
	UTM-E (X)	UTM-N (Y)
	UTM-E (X)	UTM-N (Y)

1. Cluster Number		2. Plot Number	

A. Land use/Vegetation type section (LUVS) (Take a photo of each new section)

3. Section	4. Land use/ Vegetation type	5. Accessibility	6a. width (m)	6b. length (m)	7. Designation/ protection status	8. Fire Occurrence	9. Fire Area	10. Fire type*	11. Environ Problems*			12. Intensity of Env Prob*			13. Grazing intensity	14. Livestock management*
A																
B																
C																
D																

B. Forest and other wooded land management and structure

	N	P	C	nk
15. Stand origin*				

16. Planting year

17. Stand structure

18. Canopy Cover:

	N	E	S	W
10 m				
25 m				
40 m				

19. Undergrowth

20. Shrub coverage

21. Tree/forest proposal

22. Disturbance

23.Timber extraction*		
	0	No felling
	1	Clear cutting
	2	Seed tree cutting
	3	Single tree selective cutting
	4	Group felling
	5	Strip felling
	6	Not known
	99	Other:

24.Silviculture*		
	0	No silvicultural practice
	1	Pruning
	2	Thinning
	3	Coppicing
	4	Pollarding
	5	Enrichment planting indig.
	6	Enrichment planting exotic
	7	Cleaning/weeding
	8	Sanitary cutting
	9	Prescribed burning
	10	Fire break
	99	Other:

C. Crop production/management

25.Cropping System*		
	1	Multiple cropping
	2	Improved cultivars
	3	Crop rotation
	4	Fallow
	5	Monoculture
	6	Mixed cropping
	7	Intercropping
	8	Mixed crop/livestock
	9	Agroforestry
	10	Shifting cultivation
	90	Not known
	99	Other:

26. Current and recent crops*
99. Other:

27. Soil & water conservation*		
	0	None
	1	Levelling
	2	Contour farming
	3	Terracing
	4	Crop residue incorporation
	5	Cover crops/vegetation
	6	Mulching
	7	Windbreak
	8	Grassed waterway
	9	Tree planting/Agroforestry
	90	Not known
	99	Other:

28. Nutrient application*		
	0	None
	1	Adequate fallow
	2	Organic fertilizer
	3	Mineral fertilizer
	4	Liming
	90	Not known
	99	Other:

D. In the plot

29. Ownership	
30. Recent change in land tenure? [Y/N/NA]	
31. If YES, past ownership (code):	
32. Presence of a formal management plan [Y/N/NA]	
33. Seasonality	

34. Grass biomass. Disc Pasture Meter.			
1		6	
2		7	
3		8	
4		9	
5		10	

35. Biodiversity*	36. Biodiversity status*	37. Remarks

Forest Products /Services*					
	38. Forest and tree prod/services code	39.Rank	40. Species	41. User rights	42. Remarks on FP/S
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					

43. Remarks

*multiple choice

1. **Cluster Number**	

2. **Plot Number**	

3. LUVS code _____

REGENERATION, SHRUBS (DBH < 5 cm, live seedlings, saplings, shrubs. Tick count.)
Plot radius = 4.99 m

#	4. **Species name**	5. **Language** [code]	6. **Number of similar seedlings/ saplings**					
			DBH class [cm]					
			<1.3m 0	**≥1.3m and d<1**	**1–1.9**	**2–2.9**	**3–3.9**	**4–4.9**
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Language: B= Bemba, N= Nyanja, K= Kaonde, L= Lozi, T= Tonga, Lu= Lunda, Lve=Luvale

7. **Remarks**

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1. **Cluster Number**	

2. **Plot Number**	

Trees 5 cm ≤ DBH <10 cm are recorded in 20 m X 10 m subplot.

3. **LUVS** [code]	4. **Tree No.**	5. **ILUA I Tree No.**	6. **Species name**	7. **Language** [code]	8. **Location along plot axis** [m]	**Location** 9. **Left** [m]	10. **Right** [m]	11. **DBH** [cm]	12. **Height of DBH** (if not 1.3m) [m]	13. **Bole height** [m]	14. Use	15. Quality	16. Health	17. Caus. agent	18. Severity	19. Origin	20. **Top Height** [m]
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Language: B= Bemba, N= Nyanja, K= Kaonde, L= Lozi, T= Tonga, Lu= Lunda, Lve=Luvale

1. **Cluster Number**	

2. **Plot Number**	

Trees 5 cm ≤ DBH <10 cm are recorded in 20 m X 10 m subplot.

3. **LUVS** [code]	4. **Tree No.**	5. **ILUA I Tree No.**	6. **Species name**	7. **Language** [code]	8. **Location along plot axis** [m]	**Location** 9. **Left** [m]	10. **Right** [m]	11. **DBH** [cm]	12. **Height of DBH** (if not 1.3m) [m]	13. **Bole height** [m]	14. Use	15. Quality	16. Health	17. Caus. agent	18. Severity	19. Origin	20. **Top Height** [m]
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Language: B= Bemba, N= Nyanja, K= Kaonde, L= Lozi, T= Tonga, Lu= Lunda, Lve=Luvale

1. **Cluster Number**	

2. **Plot Number**	

Trees DBH ≥ 10 cm are recorded in 20 m X 50 m plot.

3. **LUVS** [code]	4. **Tree No.**	5. **ILUA I Tree No.**	6. **Species name**	7. **Language** [code]	8. **Location along plot axis** [m]	**Location** 9. **Left** [m]	10. **Right** [m]	11. **DBH** [cm]	12. **Height of DBH** (if not 1.3m) [m]	13. **Bole height** [m]	14. **Use**	15. **Quality**	16. **Health**	17. **Caus. agent**	18. **Severity**	19. **Origin**	20. **Top Height** [m]
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Language: B= Bemba, N= Nyanja, K= Kaonde, L= Lozi, T= Tonga, Lu= Lunda, Lve=Luvale

1. **Cluster Number**	

2. **Plot Number**	

Trees DBH ≥ 10 cm are recorded in 20 m X 50 m plot.

3. **LUVS** [code]	4. **Tree No.**	5. **ILUA I Tree No.**	6. **Species name**	7. **Language** [code]	8. **Location along plot axis** [m]	**Location** 9. **Left** [m]	10. **Right** [m]	11. **DBH** [cm]	12. **Height of DBH** (if not 1.3m) [m]	13. **Bole height** [m]	14. **Use**	15. **Quality**	16. **Health**	17. **Caus. agent**	18. **Severity**	19. **Origin**	20. **Top Height** [m]
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Language: B= Bemba, N= Nyanja, K= Kaonde, L= Lozi, T= Tonga, Lu= Lunda, Lve=Luvale

1. **Cluster Number**	

2. **Plot Number**	

Trees DBH ≥ 10 cm are recorded in 20 m X 50 m plot.

3. **LUVS** [code]	4. **Tree No.**	5. **ILUA I Tree No.**	6. **Species name**	7. **Language** [code]	8. **Location along plot axis** [m]	**Location** 9. **Left** [m]	10. **Right** [m]	11. **DBH** [cm]	12. **Height of DBH** (if not 1.3m) [m]	13. **Bole height** [m]	14. **Use**	15. **Quality**	16. **Health**	17. **Caus. agent**	18. **Severity**	19. **Origin**	20. **Top Height** [m]
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Language: B= Bemba, N= Nyanja, K= Kaonde, L= Lozi, T= Tonga, Lu= Lunda, Lve=Luvale

1. **Cluster Number**	

2. **Plot Number**	

A. **STUMPS** (diameter ≥ 10 cm). Measure over bark

*Plot size: 20 m X 50 m – **NOTE THAT STUMP DATA IS COLLECTED OVER THE ENTIRE PLOT LENGTH***

#	3. **LVS code**	4. **Species name**	5. **Lang** [code]	**Location**		8. **Diam.** [cm]	9. **Ht** [cm]	10. **Years** [code]
				6. left (m)	**7. right** (m)			
1								
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18								
19								

Language: B= Bemba, N= Nyanja, K= Kaonde, L= Lozi, T= Tonga, Lu= Lunda, Lve=Luvale

B. **FALLEN DEADWOOD** (diameter ≥ 10 cm)

*Plot size: 20 m X 50 m – **NOTE THAT DATA ON FALLEN DEADWOOD IS COLLECTED OVER THE ENTIRE PLOT LENGTH***

#	11. **LVS code**	12. **Species name**	13. **Lang.** [code]	14. **Diam1** [cm]	15. **Diam2** [cm]	16. Length [m]	17. Count similar parts	18. **Decay** [code]
1								
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11								
12								
13								
14								
15								
16								
17								
18								
19								

Decay: S=Solid, R=fully/partially rotten

1. **Cluster Number**	

2. **Plot Number**	

A. **STUMPS** (diameter ≥ 10 cm). Measure over bark

*Plot size: 20 m X 50 m – **NOTE THAT STUMP DATA IS COLLECTED OVER THE ENTIRE PLOT LENGTH***

#	3. **LVS code**	4. **Species name**	5. **Lang** [code]	**Location**		8. **Diam.** [cm]	9. **Ht** [cm]	10. **Years** [code]
				6. left (m)	**7. right** (m)			
1								
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18								
19								

Language: B= Bemba, N= Nyanja, K= Kaonde, L= Lozi, T= Tonga, Lu= Lunda, Lve=Luvale

B. **FALLEN DEADWOOD** (diameter ≥ 10 cm)

*Plot size: 20 m X 50 m – **NOTE THAT DATA ON FALLEN DEADWOOD IS COLLECTED OVER THE ENTIRE PLOT LENGTH***

#	11. **LVS code**	12. **Species name**	13. **Lang.** [code]	14. **Diam1** [cm]	15. **Diam2** [cm]	16. Length [m]	17. Count similar parts	18. **Decay** [code]
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								

Decay: S=Solid, R=fully/partially rotten

1. **Cluster Number**	

2. **Plot Number**	

BAMBOO (diameter ≥ 5 cm)

Plot size: 20 m X 25 m

#	3. **LUVS code**	4. **Species name**	5. **Langu-age** [code]	6. **Status** **A**=Alive **D**=Dead	7.**Average Diameter** [cm]	8.**Average height** [0.5 m]	9. **Number of stems in clump**
1						.	
2						.	
3						.	
4						.	
5						.	
6						.	
7						.	
8						.	
9						.	
10						.	
11						.	
12						.	
13						.	
14						.	
15						.	
16						.	
17						.	
18						.	
19						.	
20						.	

Language: B= Bemba, N= Nyanja, K= Kaonde, L= Lozi, T= Tonga, Lu= Lunda, Lve=Luvale

1. **Cluster Number**	

2. **ILUA I Number**	

A. Time record	
3. Date [dd/mm/yy]	
4. Time to complete Soil Pit	:
C. GPS Reading at Soil Pit	
5. UTM-E (X)	
6. UTM-N (Y)	
7. UTM Zone (34, 35, or 36)	

B. Soil Pit Crew List		
Role	**Name**	**Phone Number**
8. Team Leader		
9. Soils Specialist		
10. Enumerator		
11. Province		
12. District		

D. LUVS code at Soil Pit	
13. LUVS Code	

E. Soil Pit Number (Use Cluster Number)
14.

	15. Water logging	**16. Erosion**	**17. Stoniness**	**18. Slope**
Degree of severity				

Codes; 1=None; 2=slight; 3=Moderate; 4=Severe

Description of terrain at Soil Pit

.....

.....

.....

Soil Feature	**Description**	**Codes**					**Horizon Designation (enter code)**		
Depth							**0-10cm**	**10-20cm**	**20-30cm**
19 Horizon	**19A Mineral Soil**	A	AB	BA	B	C			
	19B Organic Soil	H	O						
20 Boundary	**20A Distinct**	Smooth	Wavy	irregular	Broken				
	20B Topography (Shape)	Sharp	Clear	Gradual	Diffuse				
21 Coarse material	**21A Abundance**	None	Very	Few	Common	Many			
	21B Size	Fine Gravel	Medium	Coarse	Stones	Boulders			
	21C Shape	Flat	Angular	Sub-round	Rounded				
	21D Nature (Rock type)	Sand stone	Granite	Gneiss	Diorite	Gabbro			
	21E Other (specify)								
22 Colour (Matrix)	**22A Dry (Munsell charts)**								
	22B Moist								
23 Mottles	**Matrix colouration**	None	Faint	Distinct	Prominent				
24 Texture	**Estimate proportions of content of clay, silt, sand**	S LS	SL SCL	SiL SiCL CL	L SC SiC	C HC			

Depth							0-10cm	10-20cm	20-30cm
25 Structure	25A Grade	Structure less	Massive	Weak	Moderate	strong			
	25B Size	Fine	Medium	Coarse	Very coarse				
	25C Type	Single grain	Sub angular blocky	Angular Blocky	Granular				
26 Consistence	26A Dry	Loose	Soft	Slight Hard	Hard	Very Hard			
	26B Moist	Loose	Very friable	Friable	Firm	Very Firm			
	26C Wet stickiness	Non-sticky	Slight	Sticky	Very Sticky				
	26D Wet plasticity	Non-plastic	Slight	Plastic	Very plastic				
27 Moisture	Condition	Dry	Moderate Dry	Moist	Wet				
28 Compactness	Detection of special formation or cementation	Non-compact	Slight	Moderate	Compact				
29 Voids	29A Size	Fine	Medium	Coarse	Very coarse				
	29B Abundance	None	Few	Common	Many				
	29C Type	Interstitial	Vesicles	Vughs	Channels				
30 Roots	30A Size	Fine	Medium	Coarse	Very coarse				
	30B Abundance	Few	Common	Many	Abundant				
	30C Orientation	Random	Vertical	Horizontal					

NB: Simplified compilation adapted from Guidelines for soil Description (FAO, 2006)

Key to codes:-

H	Organic soil layer dominated by organic material formed from accumulations of undecomposed or partially decomposed organic material at the soil surface, which may be under water.
O	Organic soil horizon layer dominated by organic material consisting of undecomposed or partially decomposed organic litter, such as leaves, needles, twigs, moss, and lichens that has accumulated on the surface; they may be on top of either mineral or organic soils.
A	Surface mineral soil layer (usually rich in humified plant organic matter and dark in color)
AB	Transitional mineral soil layer immediately below the surface layer with dominant features resembling the A horizon
BA	Similar to AB, but B Horizon features dominating
B	Subsuface mineral soil layer, substantially altered in color, and well-formed structure
C	Subsurface mineral or/and organic soil material forming the parent materials of the soil (may comprise decayed and weathering geological rock materials- *saprolite*, alluvium or other depositions from which soil materials would have derived origin)
BD	Bulk Density of the soil
Texture Codes	S=sand; LS=loamy sand; SL=sandy loam; SCL=sandy clay loam; SC=sandy clay; C=clay; HC=heavy clay; Cl=clay loam; SiCl=silty clay loam; SiC=silty clay

Checklist for Soils data

	0-10cm	10-20cm	20-30cm
Soil Cores from pit			
Composite samples from pit			
Composite samples from plot			

Soil Collection is complete when all fields have been completed in the above forms, and the checklist is filled

1. **Cluster Number**		2. **Plot Number**		3. **LUVS**	

A. **Litter Weights from 0.5 x 0.5m quadrat**

	1	**2**	**3**	**4**	**5**
4. Litter Weight (grams)					
5. Litter Composite Sample Label					

B. **Fine Coarse Woody Debris** (diameter ≥ 2cm and < 10 cm). Measure over bark. *Plot size: Radius 3.99* (same plot as regeneration and shrubs)

#	6. **Diameter** [cm]	7. **Length** [m]	8. **Count similar parts**	9. **Decay** [code]
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				

Decay: S=Solid, R=fully/partially rotten

Updated: May 23, 2013

ILUA II Integrated Land Use Assessment Project

MINISTRY FOR FOREIGN AFFAIRS OF FINLAND

Accessibility

Code	Description
0	Accessible
1	Inaccessible due to slope
2	Inaccessible due to owner refusal
3	Inaccessible due to restricted area
4	Inaccessible due to water body
99	Inaccessible due to other reason

Land Use/Vegetation Type Section

Code	Description
Forest	
1	Parinari forest and Copperbelt chipya
2	Marquesia forest
3	Lake basin chipya
4	Chryptosepalum forest
5	Kalahari sand forest
6	Baikiaea forest and deciduous thicket
7	Itigi forest
8	Montane forest
9	Swamp forest
10	Riparian forest
11	Miombo woodland on plateau
12	Miombo woodland on hills
13	Kalahari woodland on sands
14	Mopane woodland on clay
15	Munga woodland on heavy soils
16	Broadleaved forest plantation (Eucalyptus)
17	Coniferous forest plantation (Pine)
Other Wooded Land	
21	Termitary vegetation and bush groups
22	Shrubs / Thickets
Other Land	
31	Dambos and Flood Plains
32	Marshland and Swamps
33	Barren land
34	Sandy dune
35	Bare Rock / Outcrop
36	Annual Crop
37	Perennial Crop
38	Pasture Land
39	Fallow
40	Urban
41	Rural
Water, No vegetation	
50	Inland Water
90	Outside land area (e.g. outside country)
31	Windbreak
32	Shade
33	Aesthetic
34	Recreation and tourism potential
35	Cultural heritage potential
99	Other (specify)

Designation / Protection status

Code	Description
0	Strict nature reserve/ Wilderness area
1	National Park
2	Natural monument
3	Habitat/ species management area
4	Protected landscape / seascape
5	Gazetted national and local forests
6	Game Management Areas
7	Other Multiple Purpose
8	Production Indigenous
9	Production Exotic
90	Not known
99	Other

Fire occurrence

Code	Description
0	There is no evidence of fire
1	Evidence of fire during the current year
2	Evidence of fire during the previous years

Fire type

Code	Description
0	Not applicable
1	Underground fire
2	Surface fire
3	Crown fire

Environmental problems

Code	Description
0	Not applicable
1	Not existing
2	Loss of water levels in rivers and other sourc
3	Drought
4	Flooding
5	Poor water quality
6	Pests
7	Erosion
8	Loss of soil fertility
9	Burning
10	Landslide
11	Wind throw
12	Overexploitation of forest resources
13	Overgrazing
14	Invasive species
15	Salinization
16	Fungus

Intensity of Environmental problem

Code	Description
1	Low
2	Medium
3	High
4	Very high

Grazing Intensity

Code	Description
0	No grazing
1	Occasional
2	Frequent
3	Extensive

Livestock Management

Code	Description
0	Not Applicable
1	Communal grazing
2	Fenced unimproved pastures
3	Fenced Improved pastures
4	Tethering
90	Not Known
99	Other

Stand origin

Code	Description
N	Natural
P	Plantation
C	Coppice
NK	Not known

Stand structure

Code	Description
0	Not applicable
1	Single layer
2	Two-layer vegetation
3	Three-layer vegetation

Undergrowth

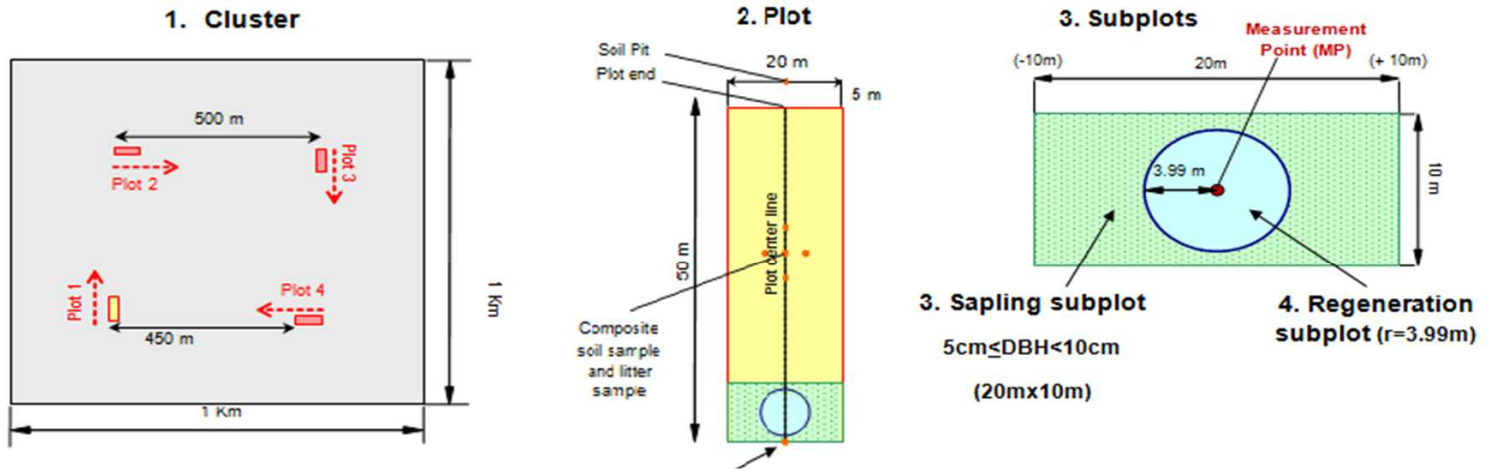
Code	Description
0	No undergrowth
1	Bushes
2	Grass
3	Elephant grass
4	New tree generation
5	Mixed of bushes, grass, herbs
99	Other vegetation

Shrub coverage

Code	Description
0	Not applicable
1	<10%
2	10-40%
3	40-70%
4	>70%

Tree/Forest Management proposal

Code	Description
0	No treatment
1	Selective cutting (commercial)
2	Selective cutting (domestic use)
3	Thinning
4	Clear felling
05	Law enforcement
06	Change designation status
07	Pruning
08	Coppicing
09	Pollarding
10	Cleaning /Weeding
11	Enrichment Planting
12	Sanitary cutting
13	Early burning
14	Boundary maintenance
99	Other



Disturbances

Code	Description
1	Not disturbed
2	Slightly disturbed
3	Moderately disturbed
4	Heavily disturbed

Timber extraction

Code	Description
0	No felling
1	Clear-cutting
2	Seed tree cutting
3	Single tree selective cutting
4	Group felling
5	Strip felling
90	Not known
99	Other

Silviculture

Code	Description
0	No silvicultural practice
1	Pruning
2	Thinning
3	Coppicing
4	Pollarding
5	Enrichment planting/seeding – Indigenous
6	Enrichment planting/seeding – Exotic
7	Cleaning /Weeding
8	Sanitary cutting
9	Prescribed burning
10	Fire break
99	Other

Cropping system

Code	Description
1	Multiple cropping
2	Improved cultivars
3	Crop rotation
4	Fallow
5	Monoculture
6	Mixed cropping
7	Intercropping
8	Mixed crop/livestock
9	Agroforestry
10	Shifting cultivation
90	Not known
99	Other

Biodiversity

Code	Description
0	No data
1	Big mammals
2	Other mammals
3	Reptiles
4	Birds
5	Insects
6	Caterpillars
7	Climbers, Lianas, Rattan
8	Reeds, Phragmites, Papyrus
9	Bamboo
10	Cactuses, Succulent plants
11	Alien invasive plant species
12	Plants (excluding those listed above)
13	Epiphytes
14	Parasitic plants
15	Bryophytes (Lichens, Mosses)
16	Fungus
17	Rare biotope
99	Other

Biodiversity status

Code	Description
0	Not applicable
1	Low abundance
2	Medium abundance
3	High abundance

Current and recent crops

Code	Description
Annual Crops	
1	Upland rice
2	Swamp rice
3	Sesame
4	Maize
5	Findo
6	Millet
7	Sorghum
8	Beans
9	Groundnuts
10	Sweet potatoes
11	Irish potatoes
12	Cassava
13	Sugar cane
14	Vegetables
15	Bisab
91	Other annual food crop
Non-food crops	
16	Cotton
92	Other non-food annual crops
Fruit trees	
17	Mango trees
18	Guava trees
19	Citrus trees
20	Papaya trees
21	Avocado trees
22	Soloumplum
23	Banana
93	Other fruit trees
Other perennial crops	
24	Jatropa
25	Oil Palm
26	Coconuts
27	Cola nut
28	Cashew nut
94	Other perennial crops
Agroforestry species	
29	Acacia sp
30	Leucaena sp
31	Gmelina
32	Moringa
95	Other agroforestry species

Ranking of Forest products/services

Code	Description
0	Not applicable
1	Low
2	Medium
3	High

User rights

Code	Description
1	Individual rights
2	Rent
3	Harvesting license/Permit
4	Land lease
5	Customary or common rights
6	Open access
7	No right
90	Not known

Use of sapling/tree

Code	Description
0	No usable / Not applicable
1	Saw logs and timber
2	Poles
3	Fuel wood / Charcoal
4	Medicinal use
5	Fruits
99	Other uses

Soil and water conservation

Code	Description
0	None
1	Levelling
2	Contour farming
3	Terracing
4	Crop residue incorporation
5	Cover crops / vegetation
6	Mulching
7	Windbreak
8	Grassed waterway / Check dams
9	Tree planting / Agroforestry
90	Not known
99	Other

Nutrient application

Code	Description
0	None
1	Adequate fallow
2	Organic fertilizers
3	Mineral fertilizers
4	Liming
90	Not known
99	Other soil amendments

Ownership

Code	Description
1	Private individual
2	Private industries
3	Others private
4	Public. State
5	Public. Local government
6	Customary
90	Not known
99	Other

Recent change in land tenure

Code	Description
N	No
Y	Yes
NA	Do not know / Data not available

Seasonality

Code	Description
1	Dry
2	Rainy

Damage severity of sapling/tree

Code	Description
0	No
1	Slight
2	Serious
3	Very serious

Origin of sapling/tree

Code	Description
N	Natural
P	Planted
C	Coppice
Nk	Not known

Stumps - Years since cut

Code	Description
1	< 1 year ago
2	1-5 years ago
3	6-10 years ago
4	>10 years ago
5	Not known

Quality of sapling/tree

Code	Description
1	Straight stem
2	Bend stem
3	Crooked stem

Forest and tree products/services	
Code	Description
0	No data
1	Industrial wood
2	Fuelwood
3	Charcoal
4	Wood carvings
11	Fruits, nuts, seeds, roots, berries, etc
12	Mushrooms
13	Fodder
14	Rattan
15	Plant medicines
16	Herbs and spices
17	Dying / tanning
18	Seeds
19	Other plant products
20	Wildlife
21	Beekeeping activities (e.g.Honey)
22	Caterpillar
31	Windbreak
32	Shade
33	Aesthetic
34	Recreation and tourism potential
35	Cultural heritage potential
99	Other

Health of sapling/tree	
Code	Description
1	Healthy
2	Compromised
3	Severely affected
4	Dying
5	Dead

Causative agents of sapling/tree	
Code	Description
0	No Damage
1	Insects
2	Disease/Fungi
3	Fires
4	Animals
5	Humans
6	Climate
90	Not Known
99	Other

Slope correction table

Slope	Degree	Factor	Horizontal length (m)								Slope
%	°	f_s	5	10	15	20	25	30	40	50	%
15	9	1.0112	5.1	10.1	15.2	20.2	25.3	30.3	40.4	50.6	15
20	11	1.0198	5.1	10.2	15.3	20.4	25.5	30.6	40.8	51.0	20
25	14	1.0308	5.2	10.3	15.5	20.6	25.8	30.9	41.2	51.5	25
30	17	1.0440	5.2	10.4	15.7	20.9	26.1	31.3	41.8	52.2	30
35	19	1.0595	5.3	10.6	15.9	21.2	26.5	31.8	42.4	53.0	35
40	22	1.0770	5.4	10.8	16.2	21.5	26.9	32.3	43.1	53.9	40
45	24	1.0966	5.5	11.0	16.4	21.9	27.4	32.9	43.9	54.8	45
50	27	1.1180	5.6	11.2	16.8	22.4	28.0	33.5	44.7	55.9	50
60	31	1.1662	5.8	11.7	17.5	23.3	29.2	35.0	46.6	58.3	60
70	35	1.2207	6.1	12.2	18.3	24.4	30.5	36.6	48.8	61.0	70
80	39	1.2806	6.4	12.8	19.2	25.6	32.0	38.4	51.2	64.0	80
90	42	1.3454	6.7	13.5	20.2	26.9	33.6	40.4	53.8	67.3	90
100	45	1.4142	7.1	14.1	21.2	28.3	35.4	42.4	56.6	70.7	100
110	48	1.4866	7.4	14.9	22.3	29.7	37.2	44.6	59.5	74.3	110
120	50	1.5620	7.8	15.6	23.4	31.2	39.1	46.9	62.5	78.1	120
130	52	1.6401	8.2	16.4	24.6	32.8	41.0	49.2	65.6	82.0	130
140	54	1.7205	8.6	17.2	25.8	34.4	43.0	51.6	68.8	86.0	140
150	56	1.8028	9.0	18.0	27.0	36.1	45.1	54.1	72.1	90.1	150

Plot coordinates are ALWAYS recorded using GPS reading, they are NOT taken from the map or from the given list of plot coordinates. Due to inaccuracy of any GPS model, recorded coordinates are allowed to differ from the targeted location.

Note: The team members should not litter on the sampling sites, on the trails or when parking their vehicle.

Let's keep Zambia clean!

ILUA II
Integrated Land Use Assessment Project