Trapnell's Upper Valley Soils of Zambia: the production of an integrated understanding of geomorphology, ecology and land use

Supplement

Table S1 Traverse summary for Ila–Tonga Traverses, June and August/September 1932. Smith and Trapnell (2001). Volume 1 pp 344 et seq.

Traverse Segment, 1947 units where inferred	**Locations**	**Vegetation**	**Soil/Parent material**	**Farming**
Inaugural transect				
13th June 1932 Mazabuka to Kafue p 348.				
U3 *Acacia* - *Combretum* thorn soils	Mazabuka 0.0 – 21.3	A mixture of *Albizzia, A. woodii*,		
U2 *Combretum-Afrormosia* transitional soils	21.3 – 25.7 (interrupted by a stream with *Albizzia*)	*Combretum, Aristida, Albizzia atunesiana, Dichrostachys nyassana Paranari* locally (dambo)	Sandy “banded” rocks Dambo	
U3 *Acacia* - *Combretum* thorn soils	25.7 – 27 27 – 29 29 – 29.5	*A.woodii/Combretum* *A. woodii* *Combretum/A. woodii*	Mica schist Mica schist	
	29.5 – 31.5	*A. woodii*	Flat valley	29.5 observation of “Bad erosion from African cultivation”
	. .	. .	. .	
E	36.9 – 38.2 Munali (Menali) Pass	*B. flagristipulata, B. taminoides* on kopjes *B. flagristipulata* and *I. globiflora*	Associated with intrusive granites in mica schist, red colour	
	.	.	.	.

	.	.	.	.
U2	40.6 – 43	*Combretum* with Hyparrhenia filipendula – *Albizzia*		Sheet erosion
		.	.	
		.	.	
E	47.4 – 52	*B. hockii* with *B. flagristipulata* and *B. tamarinoides*	Mica schist Grey schist soils	
	52 Kafue			
	.	.	.	
	.	.	.	
U2	53 – 58	*Combretum*/*Albizzia B. tamarinoides*, *Kirkia* on hills *Afrormosia* type for mapping	Quartzitic blocks	
E	58.9 – 59.8	*B. tamarinoides* hills in *Combretum*	Granite instrusions	
U2	59.8 Shimbala station	Point of transition from *B. tamarinoides* hills to *Combretum* on the flats	Laterites developed from shales	
	Lusaka			

14th June 1932 Lusaka to Kabwe (Broken Hill) p 352				
	Lusaka 0.0			
P7	2.4 – 6.0	*Brachystegia flagristipulata* and *B. hockii*	Yellowish soils with signs of quartzite.	African cultivation at 6 m in a valley with figs
	6.0 – 8.4 . .	*B. hockii*	Quartzite and mica schist	
	10.9 – 12	*B. hockii*		
P7 U2	12 – 16	*Afrormosia*, *Combretum*, *Albizzia* and *Terminalia*	Buff soil, deep orange below	African cultivation and stream
U3	16 – 16.6	*A. campylacantha*	"Sugary yellow quartzite … source of preceding soil"	
U2	16.6 – 17.3	*Afrormosia* mixed		
P7 . .	17.3 – 19.3 . .	*B. hockii, B. mimosifolia Diplorrhynchus* . .	Mica schists Quartzitic sites . .	 . .
U3	31 – 34.9	Skirting *Acacia woodii* originally A. woodii with Terminalia rhodesica and *Albizzia* or A. campylacantha locally	Soil from schists	Cultivation belt

U3	37.0 37.8 38.9	Water thickets, *A. campylacantha* with *A. hebecladoides* now much H rufa etc. *A. campylacantha Dichrostachys* thickets and *Albizzia* locally *Acacia woodii*	Black soil Black soil Red-chocolate clay-loam	
15th June 1932 Kabwe (Broken Hill) to Kafushi p 354				
. . P5	. . 21.2 – 27.4 27.4 – 31.0	. . *I. paniculata* with *Ochna* and *Uapaca spp.* *B, flagristipulata* with *I. paniculata, B. longifolia* dominant	. . Pure fine white sand, quartzite ridge Buffish clay soil, occasional 2'-lateriate blocks and laterite below	
P5 – U2	31 – 31.9	Mixed *Isoberlinia*, mainly *I. globiflora* passing into *Afrormosia* mixture with *Dalbergia*	Deep pink schist soil	
U2	31.9 – 34.2	Dense *Combretum* and tall grass then *A. campylacantha*	Buffish pink soil Laterite, ferruginous nodules	
U2	34.2 – 37.8	*Combretum* more open as associated with *Terminalia*	Pale red to pale buff soil. Dambo with white nodules	

	37.8 – 40.7 40.7 – 46.0 46.0 – 49.5	*A. woodii, Hyparrhenia* grass *A. woodii* Dambo-type with *Albizzia*; *Trichopteryx* and *Hyparrhenia* grass. An *A. campylacantha* belt *A. hebecladoides*	Some white nodules, buff soil. Better and darker soil To Chocolate loam on clay to clay-loam Occasional nodules and quartzitic pebbles	Poor European maize Cultivation Open from fire, cutting and grazing
16th June 1932 Cycle reconnaissance around Kafushi p 356				
P5		*I. paniculata* "remarkably pure and uniform over large areas" *B. flagristipulata* near dambos. *U.kirkiana* on laterite. *Digitaria* a good pasture grass	White sand to lateritic material. Laterite on dambo soils may be 2 – 4' but does not impede growth of *Isoberlinia*	Lopping trees then burning. Probably fairly frequent shifts in the bush. Slopes of dambos cultivated, not to waterside (contrasted with *B. longifolia* country). Mainly large dambos with *A. campylacantha* cultivated Alluvial and colluvial soils. In bush grey to buff sandy

				soils cultivated between or below lateritic belts. Sorghum, maize, sweet potatoes, groundbeans, calabashes and pumpkins. Occasionally bananas. Some cattle.
		A. campylacantha with *H. rufa* in centre and *Acroceras macrum* (Nile grass) near stream. *Combretum-Terminalia* dambos over laterite, sour pasture.	Dambo. Marginal lateritic sands	Said to be good grazing on these black soils.
17th June 1932 Kafushi to Mumbwa p358 P5	0.0 Kafushi . . 32.3 . .	*H. cymbaria* in dambo surrounded by *B. longifolia*	Dambo	African cultivation to stream. Sorghum (with borer infestation), groundnuts, tobacco, tomatoes
U2	44.9 – 45.5	*A. campylacantha* in tall grass	Dambo	African cultivation

18/19th June 1932 Mumbwa Boma to Nambala Mission p 361				
P5 U2		*I paniculata* on ridge, Dambos with *Combretum* *Afrormosia*, locally *A. campylocantha*, occasional *B. hockii* and *Terminalia, B. flagristipula* *Combretum* with *A. woodii. A. campylacantha* Tall *Hyparrhenia* *A. campylacantha*, figs, tall *Hyparrhenia*. *Afrormosia* to *A. campylacantha H. cymbaria* in seepage zones *A. campylacantha /Afrormosia*	 Lateritic nodules, gravel Dambo Dambo Deep red loam/clay loam Skirting dambo Dambo. Greyish soil	 Village, sweet potatoes, sorghum, tobacco.

25th June 1932 Mumbwa to Mwembeshi p 369	. .			
P7	30 – 31.8 . .	*B. hockii* / *Combretum* A. campylacantha by dambo	Dambo	African cultivation
U2/U3	67.3 69 – 69.4	*Afrormosia*, occasional *A. woodii* and *Albizzia*, *A. woodii* transition	Grey soil Dambo	Cut and cultivations Dambo cultivations
August/Sept 1932				
August 31st 1932 Nakanyanga to Chonga's p377 At margins of Kafue Flats. Route includes U2/3 and S1 (Copaifera on grey alluvial clay). Note interpretative cross section on p381	Nakanyanga's 0 2.3 – 5.0 . . 10 – 11 11. – 11.5	*C. mopane*. Band of *A. woodii, A. campylacantha, A. albida*, then *Copaifera*/*Acacia* . . *A. campylacantha* **Mufwere** Band of "bush groups" (*Gymnosporia,*	Grey to blackish clay loam Erosion "Rather sandy", erosion	First cultivation (too wet on earlier stages of transect), better grass Nankera's village at transition to *Afrormosia*. Land selection on *A.*

		Lonchocarpus) with occ *A. woodii*.		*campylacantha* and *Hyparrhenia filipendula*
11.5 – 14.5 Shown on the Figure as *Afrormosia* with occ. Dambos, bush-group, *A. campylacantha, Combretum* NB Sedimentary over much of the route, but the 1947 map shows Upper Valley at Chonga's. Heterogeneity within broader units.	11.5 – 12.0	*Afrormosia* with occasional *Parinari mobola*		
	12 – 13	*Combretum* bush groups	Erosion	Grazing
	13 – 14	Dambo, passing to *A. campylacantha* and *Albizzia harveyi*		Village and cultivation
	14 – 14.5	*Afrormosia,*		
	14.5 – 15	*A. campylacantha*		Cultivation
	15 – 15.5	Bush groups with *A. campylacantha*	Eroded	
	15.5 – 16.5	*Dichrostachys* and thicket on old mound cultivations. Inferred that *A. woodii* was original cover, perhaps with *Afrormosia*.		Mounds noted by CGT (2001) as original Tonga practice for sweet potato, "lost with the advent of the plough".
	16.5 – 19.7	*A. campylacantha*	"Dark and damp" soil	Some cultivation, limited where too wet
	19.7 – 21.5 Chonga's	*A. albida*		"An endless system of *Cynodon* hummocks from old cultivations" Some *A. campylacantha* and *A. woodii* stumps.

			Samples suggest that soils become lighter in both colour and texture on cultivation	Chonga's: Cultivation for three years, return to site in three years or more (2+1, 2+1, 2+1). Often leave for two years then return for three ("minor shifts"). Longer-term "major shifts" "a son may move to a fresh area …. the area being left when he dies or goes to hoe elsewhere". Evidence that cultivation at a site may be very long-term. Land at Chonga's selected on appearance rather than trees. "Go for higher black (grey) soils"
Sep 17th 1932 Chambwa's to Shinsana's p 414 P7	Shinsana's 19.2	*B. flagristipulata* with gravelly or old-cultivated *B. hockii. H. filipendula* and others. Dambos: *H. rufa* and others.	Chestnut to brown fine sandy loam passing at 6 – 8" into small quartizitc pebbles and ferruginous nodules, thick near dambos. Alluvial residual on dolomite	Bush cultivation, selected by *H. filipendula* and *B. flagristipulata.* Cultivate for five years, return after four then abandon. New land every year for groundnuts. Famine through lack of rain.

Sep 18th 1932 Shinsana's to Muchila's p 418.				
P7	0 – 2.1	*B. flagristipulata* with *Combretum* and dambos and occasional *B. hockii*		
	. .	. .	. .	. .
	4.5 – 7.6	Wet *B. flagristipulata* *Hyparrhenia cymbaria* *Hyparrhenia filipendula*	Lateritic nodules with *H. filipendula*	Cultivation in *H. cymbaria* (good soil) and around anthills
	7.6 – 10	*B. flagristipulata* with *Hyparrhenia filipendula* on ridge. Spurs with *A. hebecladoides, Combretum* and *Terminalia, C. mopane* at edges	Fine ochreous sandy loam from granite	
	10 – 12.8	*B. hockii, Trichopteryx, H. filipendula*	Sandier soil	
U2	12.8 – 13.6	*Terminalia – Combretum*	Flat ground with grey soil	
	13.6 – 17	*A. campylacantha to A. woodii* and figs. Route headed down to *Combretum*, occasional *A. campylacantha*, A. woodii, *Albizzia* down slope.	Red more or less sandy loam Fine red loam/clay loam Black soil	Past cultivation, with *Vangueriopsis* rejuvenation. Kampukwe's Prefer *A. campylacantha* for cultivation

	17 – 18 18 – 18.4 Muchila's	*Afrormosia – Combretum*	Granite soil	"Denuded site of old cultivation" where *Combretum* found Cultivate in *Afrormosia* bush, *Afrormosia* with *A. campylacantha* chosen by Muchila, latter with the best soil. For groundnuts *H. filipendula* and *Afrormosia* selected. For maize and sorghum *H. filipendula* and and *A. campylacantha* and *Combretum*. Thicket prefered for cultivation. Four years cultivation, return after four years then abandoned. Millet in yr 3.
Sep 19th 1932 Muchila's to Choma p 418. U2	0.0 Muchila's . .			
	6.1 – 6.8	*A. campylacantha*	Red clay-loam "clearly fertile"	Old gardens
	6.8 – 7.4	*Albizzia* ± *Afrormosia* ridge *A. woodii* slopes below	Deep red loam/sandy loam crest. Good cultivated slopes, chocolate soil	Cultivation
	7.4 – 7.6 . .	*A. campylacantha*	Black clay	Cultivation
	10.2 – 11.2	*B. hockii*	Whitish sand, then dambo head	Dambo head cultivation

	. . 12.3 – 13.4 12.8 . .	 *A. campylacantha* *A. woodii* 	 Buff schist soils 	 Old cultivation Cultivated
P7 U2	13.4 – 15.0 15 – 15.7	*B. hockii* *A. campylacantha* *Afrormosia/A. campylacantha/A. woodii*	Bush cultivation Large dambo on schist	 Dambo head cultivation Cut-outs and cultivations
P7	. . 39 – 44 . . 60.0	 *B. hockii* ± *B. flagristipulata*	 Quartzose schist	 Dambo head cultivation Dambo head cultivation
Sep 20th 1932 Choma to Mazabuka p 425. P7 U3	. . 57.5 . . 72	 *Terminalia/A. woodii* . . *A. woodii* with *A. albida*	 Laterite 	 Dambo head Possible to plough before rain

Table S2 Traverse summary for Sala Reserve (Reserve IX) Traverses, October 1932. Smith and Trapnell (2001). Volume 1 pp 427 et seq.

Traverse Segment, 1947 units	**Locations**	**Vegetation**	**Soil/Parent material**	**Farming**
Sala Reserve Traverses Volume 1 p 427 et seq.	Location information is sparse. One location is given for the Mwembeshi basin.			
5th October 1932 p 427	. . 29 – 32 on Mazabuka to Lusaka Road, . .	Eroded *Afrormosia* altered to *Combretum* by fire and erosion Note that valleys north of Kafue are either side-valleys of *Combretum /B. hockii* or *Afrormosia* with *A. woodii* belt down the centre with *Dalbergia* and *Combretum*.	Bad sheet erosion and dongas (gulleys)	
6th October 1932 p 428	. . 31 – 33.2 **Soil pits**	*A. woodii-Albizzia harveyii* much cut out and cultivated 1. No vegetation described 2. *Lonchocarpus capassa* and *Acacia* spp on edge of anthill pan.	1. Deep red residual loam, occasional lateritic nodules. 2. Brown colluvial loam	Shangala's: Land selected on *H. filipendula*

		3. Near anthills in bush near gardens	3. Brown colluvial loam (greyish ochreous brown)	
		4. By two *A. woodii* clumps on edge of main dambo. Edge of spit of A*frormosia/Dalbergia – Bauhinia/Acacia* in *A. woodii* fringe.	4. Grey buff sandy loam	
		5. Beyond first gardens in *A. campylacantha* (previously cultivated and invaded by *A. woodii*).	5. Colluvial subochreous red loam	
		6. *A. woodii*	6. Red loam, lighter than (1) with gravelly ironstone from 1'	
		7. *A. campylacantha* and figs, cultivated	7. Bright ochreous loam, ± sandy. Oxidizes redder at lower depths.	
	Generalized observations on "fertile soils"		Fertile soils: (a) riverbank residual calcareous loams (b) alluvial *A. campylacantha* and *A. woodii* slopes.	
	Generalizations on soils under dominant vegetation.	*Afrormosia*	Coarse or fine red-brown or whitish fine sand to sandy loam. Generally pale ochreous from schists. Caps eroded	

		A. woodii *A. campylacantha*	(a) residual deep fine red sand to sandy loam to light reddish ochreous loam or sandy loam. Residual schist: plae ochreous. (b) colluvial and colluvial-residual light reddish ochreous loam or sandy loam to ochreous brown loam or clay-loam. (c) wet colluvial with anthills and pans, ochroeous brown loam or clay-loam to grey-brown or bluish mottled clay [gleyed]. (a) swamp cf. anthill country (b) sweet: on chocolate-red loam on slightly sloping ground or paler alluvial loam by river: very fertile.	
7th October 1932 p 432	**Cultivated sites** Near Lumano's. Map in Field notebook (CGT 1/29) shows this a little to the north west of Nampundwe	(a) *A. woodii/A campylacantha* border or *A. campylacantha* slopes (b) Brown colluvial *A. woodii* and ochreous brown bush cultivation. (c) Red-brown residual-colluvial *A woodii* under kopjes. Also, less frequently, grey-orchreous residual-colluvial schist soil and pink-ochreous residual-	**Summarized as:** (1) Residual-colluvial *Acacia* a). Red soil by kopjes b). Ochreous slopes including riversides (2) Colluvial *Acacia* a) ochreous brown bush b)brown, wetter depressions	Trees cut at breast height, piled up and burned on land

		colluvial slopes. Or deep ochreous colluvial sites, especially dark-brown loams.	(3) Riverside residual: alluvial brown to ochreous loams. Soil compaction in cut-out and trampled (livestock) belt.	Note also grazing of *H. ruprechtii* (residual soils with *A. woodii*), *A. campylacantha*, anthills and pans. **Choice of land:**
	Shakamba's Chikoloma's Shabasonge's			(Grasses) *Setaria, H. ruprechtii* (might be *H. rufa*), *Digitaria*. *Acacia campylacantha/ A. albida* with *Hyparrhenia spp, Heteropogon.* *H. rufa/ruprechtii* maize and sorghum. *Setaria phleoides* Sweet potatoes, occasionally ground nuts *H. filipendula*: 3rd rate for cassva *Heteropogon contortes* second-best. *A. campylacantha, A. woodii*
10th October 1932 p 438	Mukulaikwa's (no direct evidence of location)	*B. hockii* and dambos with A. campylacantha, A. albida.	Ferruginous sandstone, looser under *B. hockii*: pale grey ochreous sandy soil with lateritica nodules at 1'. Passing into grey ochreous	**Cultivation:** Alluvial dambo and dambo head (grey/greyish ochreous loam down to black clay-loam at

			loam and grey loam to black clay-loam in dambos.	streamside). Chiefly alluvial dambo cultivation. Probably originally *A. campylacantha*, now *Setaria*. Good land chosen by *A. woodii, A. albida* and *A. campylacantha*. *A. albida* on sand for two years, Black soil indefinite (i.e. 11-12 years). *H. filipendula:* good land *H. rufa*: better *H. cymbaria* and *Setaria phragmitoides* also good.
13th October 1932 p 443	Kawamba's Bambuela people of Nyoka origin	*A. campylacantha, A.campylacantha/A.spp transition*	Blackish soil	Gardens, many new cultivations.
15th October 1932 p 448	Near Nampundwe (King Edward's Mine)	*Acacia spp* cut to *Combretum*	"Mealie soil" compacted	"African wants a sorghum (*A. campylacantha-Brachystegia hockii*) soil. This is a mealie soil"
16th October 1932 p 449	Momba's	*Setaria phragmatoides* *H. rufa*	Black clay, alluvial	Maize gardens Not cultivated: does not dry so soon. Only plough high land. Riverbank cultivation of pumpkins.
22nd October 1932 p 457	Chilenga's	*A. campylacantha*	Colluvial reddish to blackish loams.	Six year alternation and left for two periods. Sorghum near the river. New groundnut lands alongside existing lands. Land selection. *A. campylacantha*, (also *A.*

		Figure drawn in notes near 12.4 between observations contrasting vegetation types *Acacia* spp. ↓ "Sweet" *Albizzia struthiophylla* ↑ *Combretum-Afrormosia* ↓ "Sour" *Erythrophloeum africanum* ↓ *Brachystegia/Isoberlinia*		*woodii, Bauhinia* and *Combretum*). For sorghum: *H. cymbaria* and *A. campylacantha* Groundnuts and sweet potatoes: *H. filipendula* or *H. rufa* and *A. woodii* Maize: both
24th October 1932 p 463	Namantombwa mission			Soil selection Sorghum on "soft" black soil, *Setaria phragmatoides* and *A. campylacantha* Groundnuts: *A. woodii* and *H. filipendula*

				Maize: *H. filipendula* and *A. campylacantha*
25th October 1932 p 464	Munampelo's	*H. ruprechtii*	Haematite outcrops Gabbro and Hook granite talus	Sorghum, maize and groundnut gardens close together in one block. Small and poor, poor cultivation. Groundnuts in sandier parts. Sorghum in moister and heavier. Maize in either, best in lower parts. Poor cultivation and drought-susceptible. This community did not know names of grasses.
26th October 1932 p 468	Mwanakapote's		Colluvial, brown to ochreous brown loam/clay-loam	Good land: Black soil and *Setaria phragmitoides* and *Panicum maximum* with *A. campylacantha* better than *A. woodii* and *A. albida*. Wetter land for sorghum, higher land for groundnuts and sweet potatoes.
27th October 1932 p 471	Chibuluma's Mono's			*A. campylacantha* and thicket preferred for cultivation, sorghum in the former and maize in the latter. *Setaria phragmitoides* regarded as "good land" and *Panicum* in wet places. Land under *A. campylacantha* selected. Where absent, *Setaria*

				phragmitoides regarded as superior to *H. cymbaria.* *Albizzia* and thicket gardens also cultivated. Sorghum and maize in both, *A. campylacantha* and *S. phragmitoides* best for sorghum. Groundnuts in light sandy upland soils, under *Albizzia* and *Combretum*
28th October 1932 p 475	Chibolela's Muswela's			Black soil under *A. campylacantha* favoured for gardens. Some in fringing *Afrormosia*, *Terminalia torulosa* and *B. hockii*. *Combretum* and *H*. *filipendula* chosen for sweet potatoes. Maize grown on anthill gardens. Sorghum on *A. campylacantha* and *H. rufa.* Groundnuts grown under *B. hockii* or with maize (and pumpkins) in anthill gardens. Groundnuts not grown on *A. campylacantha* sites. Tall grass generally liked. Cultivate *B. hockii* edge and *A. campylacantha* dambo

				head, probably burned for maize and pumpkins.

Table S3 Traverse summary for Road Traverses, 1933/34. Smith and Trapnell (2001). Volume 1 pp 528 et seq.

Traverse Segment, 1947 units	Locations	Vegetation	Soil/Parent material	Farming
Road Traverses Southern and Central Provinces 1933/34. Volume 1 p 524 et seq. Exact dates unknown in 1933. Some 1934 observations are of uncertain date.				Mainly Plateau and Transitional/Thorn sites. Farming system descriptions address plateau sites in the 1933 road traverses (south).
1933				
Pemba to Kalomo p 528 P7	Pemba 111.8	Bush group dambo in *Isoberlinia-Uapaca/B. flagristipulata*	Profile under *Brachystegia-Uapaca* . Some *B. hockii* 0.25—0.5 miles from dambo. Grey soil over 6" – 1' white very sandy loam over 3' lateritic pebbles. Further upslope from dambo up to 3' of the grey soil, without concretions, if present not marked and not near surface. Further up, buff soil and subsoil. Cap: buff soil denuded to gravel profile of small lateritic nodules, subsoil almost pink. Profile: 3' – 1' grey over buff sand (very sandy loam) passing into gravel ± clay with iron concretions. Nodules fewer but still present in gravel. In general 1' – 3' grey/buff over ironstone gravel. More often 1' than 3' Locally soil	Big new shifting cultivations

	Choma 152.4	*Isoberlinia-Uapaca* Old forest *Parinari-B. hockii*	gets pinker with redder B horizon. Locally denuded to lateritic gravel horizon.	
Kalomo round trip via Lunkalamba p 529 P4	Kalomo S4 207.8 Lugobo's village. Lunkalamba	*B. hockii* belts and large bush-group dambos *B. flagristipulata* and dambos *Trichopteryx* bush groups.	Very sandy soil	Past sorghum – millet and maize cultivations Extensive cap cultivations of open country Ploughed downslope "Shelling maize in quantity", wagons going to railway line. Village in place having moved here 3 y.a. Groundnuts on new land, second year standing groundnuts. Occasional sorghum-maize. Very large maize lands locally. All *Hyparrhenia* cultivated. Grow roselle and a few cassava plants. Maize, sorghum and finger millet. Finger millet on anthills. Formerly sorghum and bulrush millet. Formerly separate sorghum

				and bulrush millet gardens, now alternate rows (after introduction of plough). Millet stopped here due to birds To W. *I.paniculata* and millet country
Kalomo to Macha Mission p 530	243. Kalomo S4 Munakumba . . . 281 Chifusa's P7	*B. flagristipulata – B.hockii* *B. flagristipulata* to *B.hockii/Uapaca*		New groundnut lands with ash-patch finger millet – maize – maize/sorghum$_2$ Bush gardens, finger millet on burnt patches and maize or sorghum. Sweet potatoes or groundnuts on new land then sp sites left or planted maize-gn, new land under gn always followed with other crops: maize and sorghum-maize on gn sites or finger millet sites. Cultiv 3 – 5 years, return after 3 – 4 yr if Hyparrhenia grows. Cultivation in *B. hockii* Bulrush millet with sorghum and maize. Finger millet in plots. *Maize/sorghum–bulrush millet$_3$ rotation or finger millet or groundnuts/maize/sorghum-bulrush millet or finger millet or groundnuts/maize-sorghum-bulrush millet latter perhaps more commonly

Macha to Namwala (initially south, to Chilumbi then north via Mapanza) p 533				
P7	324.4 (heading N from Chilumbi)	*B. flagistipulata* ± *B. hockii*		*B. hockii* cultivation
U2	324.8	Transitional Lower shoulders: *Afzelia*, *Ostryoderris* very extensive to level tall grass +- *Trichopteryx Ostryoderris* dominant *Albizzia harveyi* *Pterocarpus martinii* *Brachystegia, Diplorrhynchus* -> *Hyparrhenia filipendula* Tall *Terminalia* and *Afrormosia* Gentle slope -> *Hyparrhenia filipendula, Andropogon, Ostryoderris* bush *Afrormosia* belts	Red soil Schists Quartz crests Red soils	
	332.2 Mapanza mission . .			Ploughing and break-down of soil. Erosion general
U2	337.7 Mbobela's	*Afrormosia* ± *Erythrophloeum* Transitional		No bulrush millet, no sale for groundnuts. Fences gardens with strips or rows of large cassava. Large gardens

?1934?				
Following Lusaka to Mumbwa via Kafushi U2 p 542	Nangoma		"Deep red to orange soil"	Saw site in fourth year of cultivation. Sweet potatoes. Sorghum-maize$_4$ /sweet potato – cassava. Anthill tobacco, *Hibiscus asper* "eaten third year= two rains" Sweet potatoes eaten and then maize and fallow three-four years, moving down dambo, return when bush high. Cassava eaten in year after abandonment from maize.
P7	Chisako's	*I. paniculata*		Tobacco anthill gardens and maize-pumpkin ash gardens in bush. Trees/bush cut in June-July, piled round anthill and left to dry then burnt in August-September. Left to cool for a month (October), and then plant in November. Early maturing crops, maize and pumpkins or finger millet and pumpkins are planted round the edge of the burn anthill garden (**Chishita**). **Chishita** later be extended into bigger field (**Muunda**).

				In the larger cleared garden (Muunda); finger millet or maize in first year and then pumpkin if soil is good or maize only ; or maize with/without finger millet in both years. Log sites around made into Maize-sorghum or sorghum-pumpkin fields. Alternatively clear trees at new site around the anthill and plant maize-sorghum-pumpkins rotations (three years total) and then sweet potatoes before abandoning site for good.
21st/22nd Feb 1934. Short traverses based in Monze (U2/U3)				
21st Feb 1934 p 547 U3	10.2 10.5 11.2	*Brachiaria rurulosa. A. campylacantha* stream *A. woodii/A. campylacantha* *A. campylacantha* occasional *A. albida*		Cultivation Cultivation Cultivation "Very fine land. Large belt". Large maize and sorghum gardens (stumped) with small, unstumped groundnut gardens often with a groundbean garden alongside. "Large `black

				jack' <*Bidens* spp> bad in lands".
	14.1	*Afrormosia* and tall *Acacia welwitschii*. *A. woodii* occasional, damp.	Lateritic nodules, laterite with embedded Quartz and hard fine-grained sandstone.	
	14.7 . .	*A. campylacantha*	Dambo	
	17.2 Shibimba's	*Afrormosia* spur, but in transitional area. Cropping description for *A. campylacantha* "good land".		Bullrush millet, used to be chief? crop then a good deal of sorghum, now mostly maize. Three years cultivation and return after three years. Groundnuts/maize, sweet potatoes.
23rd Feb 1934. Monze to Pemba. (U2/3 via P7 to U2) p 550		*Acacia woodii-Albizzia struthiophylla*		Groundnuts, groundbeans, sweet potato -> maize and some beans
		A. campylacantha – Setaria ciliolata	Red soil loam to sandy loam.	Maize, formerly sorghum. **Probably** [RML emphasis] former finger millet cultivation on anthills or bush. (cf also maize and

				pumpkins, cf beans of sandy soils under trees) Very good groundnuts. "Caps being stony, there is now, at any rate," no longer thicket cultivation. "Contoured sweet potatoes would stop erosion from the prevalent up and down ploughing" Probable orignal complete garden system: Anthills: f.millet Thorn edge: groundnuts, sweet pot, maize Thorn dambo: Sorghum, maize. Benzu's village. Choose land by long grass, unconscious of their practices. Grew finger millet "when the locusts came", stopped growing sorghum "when the white man came". Now grow "the white main's maize". Had a black maize "(in the white man's days)". Sorghum apparently the chief crop before.

March 1st 1934. Traverses around Tara S4 onto P7 p 558 P7	Simeba's	*B. hockii* fringe *B. flagristipulata* Site for cultivation description "a long *Isoberlinia – Uapaca – B.hockii* cap"	Soil pale pink-ochreous small-gravelly kaolin granite sand.	*B. hockii, Uapaca* and *Terminalia* vegetation considered indicator of good land for agriculture, but not *B. flagristipulata*. No dambo cultivation. Land cleared by cutting trees in winter and then burning. Three year cropping sequence system; mostly maize with or without sorghum. However, also groundnuts or maize rotated with sorghum or maize. Sorghum sometimes in new land. Large areas cleared because of poor soils and only smaller portion of about a third used at a time (50 acre used at a time of 150 acre cultivated by 6 men from 200 acres cleared). Fields normally enlarged in circular fashion from the cap site. Livingstone sweet potatoes in *B. hockii* bush, but bean

				and groundnut do not grow well. Normally 3-year cultivation and then shift to new area, but may use field for up to 5-7 years. H. (filipendula ?) returns after 2 years' cultivation. Keep a small portion of old land but larger field in new land. Cattle kept in gardens to add fertility (making land strong). Stopped growing finger millet 2 y.a.
March 3rd 1934 Field route around Kaloma p 562 P7	Munakumba's village on	*B. flagristipulata* spur between two dambos		Gardens in *Brachystegia flagristipulata* bush on reddish sand soil About 10 individual men, each with 2-3.5 acres. Rotations, groundnuts or Sorghum rotated with maize. Sweet potatoes grown in separate field together with early maturing maize (**Kafwamba**), while Cassava grown as hedges around the home. Finger millet grown in recently cleared and burnt field on ash patches. Cowpeas mix-cropped with maize

				Large area cultivated due to poor soil. Mundambwe (malvaceous spinach) and Bwengo (*Sesamun angolense*) eaten as vegetables.
March 6th 1934 Routes around Zimba p 565 P7 with dambo	Mantanyani's	*B. flagristipulata. B. hockii* and `sweet bush' dambo head with *A. woodii, A. woodii* in dambo		Gardens described as intermediate between plateau bush circle cultivation (Tonga practice) and differentiated bush/dambo head or associated dambo cultivation of Transitional bush. Dambo cultivation. 15 married men (27 men in all) all have fields in dambo. Main ones, good maize. Village gardens in area ca 40 acre chosen by *Hyperrhenia filipendula* or *Hyperrhenia ruprechtii* with *Brachystegia hockii* and *Terminalia sericea*. Groundnuts or maize rotated with bulrush millet in village gardens. Main sweet-bush gardens, by the dambo head, chosen where there is *Hyperrhenia filipendula* or *H. ruprechtii*

				and *Acacia woodii*, (and *Albizzia* and *A. campylacantha*) and here Maize-sorghum rotation. Land dominated by *Brachystegia flagristipulata* regarded as less fertile and only used three years with finger millet the only suitable crop. Chief has separate large garden in best land : dambo head with *A. woodii* on reddish to grey sand loam. *A. woodii* in dambo
	Siamberere's	*B. flagristipulata*	On schist with occasional *B. flagristipulata* caps and belts	*B.flagristipulata* cultivated:groundnut gardens, finger millet with maize and sorghum. Erosion and tree-cutting general.
	Saniyama's	*B. hockii*, *B. flagristipulata*		*B. hockii* cap in schist, *B. flagristipulata*, with large block gardens: finger millet left standing in groundnut gardens. Bullrush millet.

Table S4. Observations of farming systems

Shifts are indicated by C (cultivation) and F (fallow) with subscripts indicating numbers of seasons. R indicates “return” and A “abandon”.

When out-of phase shifts are managed on separate blocks of land then the number of blocks is indicated as a superscript, a 1 is used where it is explicitly stated that all cultivated land is in the same phase.

Crops are indicated by codes below. A solidus between two or more crops indicates that these may be grown together (perhaps in patches with contrasting conditions) in any one season, an n-dash indicates changes in cropping over a rotation. A superscript after a crop code indicates the number of successive seasons of this crop in the rotation.

bm: bullrush millet (pearl millet); fm: finger millet; gn: groundnut; m: millet; mz: maize; pm: pumpkin; sg: sorghum; sp: sweet potato

System	Date & site	Vegetation	Shifts/Rotations	Comments
Plateau				
P5	16/6/32, Kafushi	*I. paniculata*, *A. campylacantha* at dambos	"Probably fairly frequent shifts"	"Lopping trees then burning"
P7	17/9/32. Shinsana's	*B. flagristipulata* with *B. hockii*.	$C_5{}^1F_4C_?A$	New land taken in for groundnuts each year, drought limitations
P7	1933 Pemba	*Isoberlinia – Uapaca*	"Big new shifting cultivations"	
P7	Munankumba	*B. flagristipulata – B.hockii*	New land under gn, finger millet (ash) maize – maize/sorghum$_2$ Bush gardens: fm(ash)/mz/sg; gn/sp – mz or mz/sg; $C_{3\text{-}5}F_{3\text{-}4}$ (returning if *Hyparrhenia* grass grows)	
P7	1933 Chifusa's	*B. hockii*	mz/sg – bm$_3$ *or* fm/gn/mz/sg – bm *or* fm *or* gn/mz/sg – bm (latter more common).	fm on ash patches, suggests less use of this more recently.
P7	1934 Chisako's	*I. paniculata*	Management of cleared areas as follows: • Early maturing crops (mz, pm, fm/pm) around edge. • In larger garden: fm$_1$/mz – pm$_1$ (good soil) *or* mz$_2$ *or* mz/fm • Log sites: mz – sg$_3$ *or* sg-pm patch • May cut up trees around anthill and plant mz – sg – pm (3yrs) in *I. paniculata*. • May follow with sp then abandon indefinitely.	Trees cut, brush burned around anthill in Aug/Sept. Planted November. Grass may be brought in for ash.
P7	1/3/34 Simeba's	*B. hockii / B. flagristipulata*	200 acres cleared by 6 men. Trees cut in winter and burned 150 acres for cultivation, of which 50 are in use at any one time. Three year's cultivation gn/mz – sg/mz (most land in mz±sg). Hyparrhenia and other grasses return after 2 years	Large area cleared reflects poor soil, enlarged in a circle. Stopped growing millet 2 y.a. Most villager gardens are for 3 y only, and extended, but some cultivated for longer with cattle put into gardens.
P7	3/3/34 Munakumba's	*B. flagristipulata* spur between two dambos	fm sown in ash around stumps or burnt sites gn/sg – mz	10 men with 2 – 3.5 a per head. Large area reflecting poor soil (although variations in soil

			cv hedges, sp in separate fields. cp intercropped with mz	over the plateau are recognized). Circular extension of strips managed by individuals.
P7	6/3/34 Mantanyani's	*B. flagristipulata* / *B. hockii* and dambo head with *A. woodii*	'Sweet bush' mz – sg Village gardens *H. flipendula/ H. ruprechtii* with *B. hockii*, gn/mz – bm In *B. flagristipulata* fm_3	Gardens 'intermediate' between Tonga circle plateau busch cultivation and dambo cultivation/Transitional bush/dambo cultivation. All men have fields in dambo
P7	6/3/34 Siaqmberere's	*B. flagristipulata*	*B. flagristipulata* cultivated, fm with mz and sg	Erosion and cutting general
P7	6/3/34 Saniyama's	*B. hockii* / *B. flagristipulata*	*B. hockii* cap, with large gardens. New gardens with gn. Millets.	
Upper Valley				
U	31/8/32 Chonga's	*Acacia spp*	$C_3^2F_2R$ Two fields, second one cultivated in year 3 compensating for reduced yield on the first ("minor shifts")	Semi-permanent agriculture, possibly with "major shifts", e.g. on transition from father to son. Noted that cultivation might be for 4 years in other sites where less land is available.
U2	18/9/32 Muchila's	*Afrormosia, Afrormosia/A. campylacantha*	$C_4F_4C_?A$ Millet in year 3	Soil for different crops selected on vegetation
U	10/10/32 Mukulaikwa	*A. albida* *A woodii, A.albida, A. campylacantha*	2-year cultivation on sandy soils 11 to 12 year's continuous cultivation on black soils	
U	22/10/32 Chilenga's	*A. campylacantha*	"6-year alternation and left for two periods" *It is not entirely clear what Trapnell means here.*	New groundnut lands opened alongside existing lands.
U	1933 Nangoma		sg – mz_4 / sp – cv F_{3-4} move down the dambo and return when bush is high.	
U3	21/2/34 Shibimba's	*A. campylacantha* *Afrormosia* spur in transitional area.	Large stumped maize and sorghum gardens, with small unstumped groundnut gardens and often a groundbean garden alongside. C_3F_3 gn/mz – mz – sp	"Very fine land" Bulrush millet previously mahor crop, then sorghum widely grown, now mostly maize.
U2/U3	23/2/34	*A. campylacantha* *Setaria ciliota*	Inferred original garden system with fm on anthills, gn, sp, mz at thorn edge, sg and mz on thorn dambo.	

Table S5. Changes in farming practices

Roman type indicates information apparently provided by informants. Italic indicates information apparently inferred

Crops are indicated by codes below. A solidus between two or more crops indicates that these may be grown together (perhaps in patches with contrasting conditions) in any one season, an n-dash indicates changes in cropping over a rotation. A superscript after a crop code indicates the number of successive seasons of this crop in the rotation.

bm: bullrush millet (pearl millet); fm: finger millet; gn: groundnut; m: millet; mz: maize; pm: pumpkin; sg: sorghum; sp: sweet potato

System	Date & site	Vegetation	Comments
Plateau			
P4	1933 Lugobo		*Large scale mz, production shelled and bagged for transport to the railway line. "Very large maize lands locally" occasional sg – mz.*
P4	1933 Lunkalamba		Planting mz, sg and fm; fm on anthills. Formerly sg – bm. Formerlly separate sg and bm gardens, now planted in alternate rows (since plough used). Notes that birds stop millets. Note "entry" of bm in sandy regions of Zambezi drainage.
P7	Simeba's		mz now mostly grown, with or without sg. Stopped growing fm 2 yr previously.
Upper Valley			
U2/U3	31/8/32 p 380 15.5	Scrub on old cultivated sites	*Inferred by CGT (in 2001 footnote) that these old mounds represented traditional Tonga sp cultivation no longer practices "with the advent of the plough"*
U3	21/2/34 Shibimba's	*A. campylacantha*	bm used to be chief ? crop, then a good deal of sg, now mostly mz.
U2/3	23/2/34	*A. campylacantha – Setaria ciliolata* site	mz grown, formerly sg. Inferred that *originally fm was grown also mz and pm*
U2/3	23/2/34 Benzu's		*sg "apparently the chief crop before".* Grew fm "when the locusts came". Stopped growing sg "when the white man came", now mostly mz. "Had a black maize once (in the white man's days)"

Table S6a. Ethnolinguistic groups in the "Tribal Index" to Smith and Trapnell (2001), volume 1 with references in the Upper Valley traverses studied here. The references are classified into 9 subsets. The corresponding Language Group, from Trapnell and Clothier (1937) also used by Smith and Trapnell (2001), is given in the final column

	Community or part of identified	Soil selection practices	Cropping practices	Wild /famine foods	Plant names	Trading (non-agric)	Grazing transfers	Comment /Comparison (CGT or others)	Cultural practices	Language Group
Batwa	6		2	3			2			**None**
Ila	3	2	1	2	7			3	2	**IT**
Kaonde					3					**K**
Lenje	1		1		1					**L**
Baleya			1							**None**
Lundwe	4	3	1					1		**IT**
Mbala		1				3	1			**IT**
Nkoya	1									**N**
Rozi*						1				**SR**
Sala	5				1		1			**IT**
Sanga	2					1				**None**
Tonga	6	1	1	2	4					**IT**
Totela			1			1		1		**ST**

*Lozi, also referred to as a source of information to others about manuring practices.

Table S6b. Recent languages and dialects from the Glottolog classification (Hammarström et al, 2022) and corresponding language groups from Trapnell and Clothier (1937) and Smith and Trapnell (2001).

Subfamilies are all within the Narrow Bantu family, East Bantu or Central Western Bantu. Further subfamilies are given at no lower a level than is required to separate the languages and their dialects.

Subfamilies, languages and dialects following Hammarström et al (2022).						***Trapnell's Language Groups***	
Subfamilies					***Languages Dialects***		
NARROW BANTU	EAST BANTU	SABI			Lamba	**BL** Bulima-Lamba *including* Sewa	
					Seba (Sewa)		
		BOTATWE	GREATER EASTERN BOTATWE	KAFUE	Ila Lundwe	**IT** Ila-Tonga *including* Sala, Bambala, Lundwe, Toka, [Bambuela]	
					Lenje		**L** Lenje
					Sala		
					Tonga		
				TOKA-LEYA-DOMBE	Toka		
			WESTERN BOTATWE		Totela	**ST** Sikololo-Tonga *including* Subya, Totela	
					Subiya		
		SOUTHERN BANTU			Lozi (Rozi)	**SR** Sikololo of Rozi	
	CENTRAL-WESTERN BANTU	LUBAN			Kaonde	**K** Kaonde	
					Nkoya	**N** Nkoya	
					Luba	**LN** Lunda, Ndembo, Luba	
		NJILA	NORTHERN NJILA		Mbala		
			SOUTHERN NJILA	CHOKWE-LUNDA	Lunda Ndembu		
				RUUND-SALAMPASU	Luvale	**LA** Luvale - Angolan	
		GREATER LUYAN			Luyi	**SL** Sikololo of Luyi	

Table S7. Clothier's "Agricultural and Bush Types" for the Kafue Basin (Clothier, 1933).

	Plateau bush	Transitional bush	Sweet bush
Soils	Eluvial sand soils of the old peneplain and less-leached residual or colluvial soil	Residual sandy soils of country of less reduced relief and greater fertility than PB. Extends as caps into the plateau on certain parent materials	Fertile colluvial slopes and plains of the lower parts of drainage basins, also some colluvial soils associated with basic parent materials
Vegetation	Typical vegetation is *Brachystegia – Isoberlinia* woodland with *Combretum – Terminalia* tree/grassland fringe	*Combretum – Afrormosia* and *Albizzia* scrub-woodland, with dense *Combretum – Canthium* or *Dalbergia* belts in fire-protected areas.	*Acacia* tree-grassland with tall *Hyparrhenia ruprechtii* and *H. filipendula*, scattered *Ficus*
Cultivation systems	**Residual Caps** Limited extent due to options for dambo cultivation. Smaller gardens around "haystack" anthills. Dependent on nutrient content of ashes from burned vegetation. Anthills may be specially selected. Two to three years continuous cultivation. Gardens sown to fm, pm and miungu (edible gourds). Vegetation spread thickly and burned at end of the dry season. Millet planted with dibble sticks in the ashes. Contrasted with "true cap cultivation" as under "Dense Scrub" in **Transitional Bush**.	**Dense Scrub** On residual caps, cultivated for nutrient value of ash. Cultivated as main gardens, small areas in Dense Scrub may be worked along with gardens in Sweet Dambo or Colluvial Belt. Sites, mainly near Pemba, selected by dense scrub growth which is cut, spread and burnt at the end of the dry season. 0.5 – 1 a added annually, for 2 – 3 years, once the area is too large to be worked less productive land is fallowed. Cultivated for 3 – 5 years, usually by hoe. Main crop is mz, underplanted with pm, gourds, cowpeas, melons etc. About 0.5 a gn planted in year 2.	**A**. *A. woodii* belts and *A. albida* headlands over sand loam-loam, and transitional *A. woodii* to *A. campylacantha* over heavier loam. The latter particularly favoured by African cultivators by swamp edges. sg gardens over *A. campylacantha* with *H. rufa*; mz, gn and root crops over higher sites with *A. woodii* or *A. albida* and *H. ruprechtii* or *H. filipendula*. Any site cultivated fpr 7 – 10 yrs max. Land cleared and taken into cultivation over 3 years, then extensions added. Yr 1 in gn or sp then sg or mz. Older sections fallowed. Any section may be worked up to 16 yrs where primary bush is cleared. Maybe only 5 on *A. woodii* caps and shoulders where previously fallowed land is cultivated again. Fallow period may be after one new site is worked, or two, or by "son's son". May depend on land

			availability. Grazing / short fallow may prevent secondary succession on fallowed land. Suggested that Sala reserved much affected by overgrazing. With a plough significant areas can be devoted to a commercial maize crop.
	Bush Fringes Where dambo cultivation is practiced land in the marginal bush belt, typically with *H. ruprechtii* and *H. filipendula* with more friable, poorish sandy-loam soil is cultivated for sp, cv and other root crops. This is done by mound cultivation after land clearance. Mounds give greater depth of tilth and organic matter. sp gardens, of about 0.5 a extended annually by 0.17 a, with an equivalent area abandoned. The same plant regenerates for 3 seasons. cv may be grown for up to 8 years. Cultivation near settlements to deter bushpigs.	**Colluvial Belts** Red sandy loams, more fertile *Combretum – Albizzia* land Main garden, or (more commonly) may be cultivated with maize as a subsidiary garden to cultivation in Sweet Dambo. Small gardens may be worked along with domestic gardens in Dense Scrub. Where markets are accessible 3 a plots may be also worked for commercial mz. Where the main garden, cultivated like Sweet Dambo. Worked for 5 years. Land is opened in 2 – 3 years, with 0.5-a patches opened in subsequent years for gn and groundbeans, before cultivation with the main crop in subsequent years. Poorer land is fallowed once a larger area is in cultivation, after 2 – 3 yr fallow sp may be planted. Where markets are available up to 8 a may be ploughed, 3 – 4 a for mz. Ploughing is not common.	**B.** *A. woodii* intermingled with *A. albida* belts over granite-limestone contact. Sandy loam to loam on very fine fertile caps. Potential for maize production but not widely undertaken. Men focus on cattle while cultivation is largely by women. Gardens may be worked for up to 8 years in part, but often only for 4 or 5 after which grasses are allowed to regenerate. Total fallow may be just 10 years, but often left to the next generation. Gardens typically small, sg and mz, or all in mz with sg in small area or on dambos/river banks (heavier wetter soil). sg may be interplanted with mz, pm always interplanted with mz. bm often planted as “drought insurance” in last two years. Land added annual in gn, and sp mounds near main gardens. Gardens may be larger where women may manage a sg farden and men grow a commercial mz crop, area depending on whether hoed or ploughed.

		Thorn Fringes Red colluvial loam adjoining dambos. *A. woodii* and other *A. spp* along with *Hyparrhenia spp*. Very fertile. Almost always cultivated for mz and gn (more friable soil), and subsidiary to sweet dambo gardens which are the main productive land. Extensive maize gardens may be made in better Thorn Fringe land with *A. woodii*. Soils are sandy loams and are suited for gn, cowpeas, gourds and mz. Large mz gardens may be grown commercially where markets are available. Land is cleared and cultivated as in Colluvial Belt areas	
	Dambo Heads and Sweet Dambo Gardens in soil from loam to clay-loam in texture, and "chosen where they find the *A. campylacantha* accompanied by tall *Hyparrhenia spp*." (*H. rufa* and *H. filipendula*). Quite large areas of "heavy fertile soil" can be cultivated as main areas for production by "large village units". Mainly planted to sg, with some interplanted mz and	**Sweet Dambo** Black colluvial or alluvial clay loams with *A. campylacantha,* and *H. rufa, H. filipendula* and other grasses. Generally fertile, excellent quality in loamy stream valleys. Cultivated as main garden, maybe with subsidiary maize cultivation in the Colluvial Belt. A family on average cultivates 3 a in this unit, with 0.17 a of gn in Thorn Fringes unless there is sufficiently friable soil in the Dambo garden.	**C**. *A. campylacantha* fringes over granite margin. African cultivation at flats edges and by mouth of tributaries to Kafue. Latter similar to transitional systems under A. Flats edges: gardens on alluvial grasslands or bush edge/thick bush. Flat edge gardens are the main ones, sites selected by *A. woodii* or *A. albida*. Sandy grey loam derived from granite does not support long cultivation., gn_{1-2}, mz_3 or sg_3, bm_{1-2} fallow for a generation/ 10 –15 years Dense bush gardens mz_1, bm_2 not always grown, particularly if land is plentiful.

	underplanted vegetable crops and cowpea. gn, groundbeans and other crops are typically planted in more friable soils (see Bush Fringes above). Land clearance begins in lower, heavier sites, and over 2 to 3 years this is extended up to the bush fringe. After initial clearance small areas are opened, planted to gn and then to sg in year 2. Some less productive land is fallowed during this period. Total area of a garden is 5 – 7 a with 2 – 5 a in cultivation.	About 0.25 a is opened around the village for sp (domestic garden). If markets are accessible up to 3 a in sandy-loam Thorn Fringe or Colluvial Belt may be cultivated for commercial mz crop where this land is available. Tobacco may also be grown, up to 1 a, typically 0.13 – 0.25 a. Cultivation systems depend on marginal bush. Two cases A. Better *Combretum – Afrormosia* soils transition to *Combretum – Albizzia* (sand loam to a brown sandy loam) and a marginal belt of *A. woodii* into the heavy loam Dambo garden soils under *A. campylacantha*. Villages in marginal *A. woodii* and *Combretum*. Commercial mz is planted in the latter behind the village, root crops planted in mounds near the village, main sg gardens in wetter *A. campylacantha* soils below the *A. woodii* fringe, gn grown in the latter situation. B. Poorer transitional types approaching the Plateau Bush. *Combretum – Afrormosia* passes to marginal *Combretum – Terminalia* (poor sandy loam) into *A. campylacantha* in the Sweet Dambo. Villages in marginal area with root crops. Gardens with sg extend up to the fringe soils, and gn are planted in the margin of the *A. campylacantha* soils. No commercial mz crop.	

		In both cases garden sites are selected by strong growth of *Hyparrhenia* grasses. Ideally wettish loams under *A. woodii* and *H. filipendula* are favoured, next-preferred is clay loam under *H. rufa*. Where these conditions are too wet and heavy, sandy loam margins with *A. woodii* and *A. campylacantha*, with *H. filipendula* are preferred. Gardens for sg in both cases at the marginal sites. Land is worked for 8 – 10 years. Gardens opened for gn on lighter soils usually revert to mz. A new gn garden is addes annually, and old land is dropped when the total cultivated area becomes too large. A fallow period may be 30 – 40 years. With a near market and a plough 4 a of sg may be grown (along with some interplanted mz) with 6 a mz. Without the plough 3 a sg and 2 a mz is more likely. Away from markets 3 a sg is grown and maybe 1 a mz in a bush garden. Gardens for sp also grown with addition of 0.5-a gn garden annually.	
Population	Widely distributed in groups of villages, along rivers and dambo heads.	Distributed in groups of villages along river tributaries. Widely dispersed in the southern Dense Scrub area	Closely distributed throughout, along flat edges and more fertile river shoulders.
Changes and problems	The main crop is sg, mz of secondary importance except where there are opportunities	Recent changes noted where cultivators are attracted from large gardens in Dense Scrub	Much land opened up and overgrazed. Large expanses of open grass headland with shrubby

	for commercial production. mz is interplanted with sg and grown as an early food crop to be eaten green. Gourds and pm are important, miungu also for calabashes. Melons and other fruits and vegetables are widely grown. Cowpea commonly interplanted and sp grown by all communities. Yams and cv are commonly grown. Tobacco grown, sometimes commercially. Previously fm was very important on cap cultivations, supplanted largely by dambo cultivation of sg.	to cultivation of Sweet Dambo soils with the plough. Cap cultivation in Dense Scrub was previously almost entirely of fm, now only in small patches and the main crop is mz. Hoeing in gardens is generally adequate in the first year (3 – 4 inches), but deeper cultivation is required in subsequent years to break up pans and allow roots to reach leached nutrients. Where ploughing is done this is often too shallow. Most ploughing in Dambo Gardens and marginal bush is done across the contours, and not generally to sufficient depth.	*Combretum – Terminalia* bush and twitch grass in place of *Hyparrhenia* spp. A. Weeds and loss of soil fertility are main limitation under A. Could both be reduced by ploughing, and ploughing to sufficient depth to avoid development of pans. With ploughing and rotation permanent cultivation would be possible. B. Shallow cultivation seen as a limitation, maize does not root deeply enough, and may be lost in a January dry spell. Early maturing mz preferred, but drought-susceptible, sg recognized as more resilient, and used to make beer. mz preferred other factors being equal. Rain also limiting on sp production.

Table S8. Summary of soil descriptions and associated vegetation units in the Ecological Survey reports (Trapnell and Clothier, 1937; Trapnell, 1943) and the Vegetation – Soil Map of Northern Rhodesia (Trapnell et al., 1947)

Numbers in bold are the printed paragraph numbers used in all three reports.

Ecological Survey Central-Western (C-W) report. Trapnell and Clothier (1937).	**Ecological Survey North-Eastern (N-E) report. Trapnell (1943)**	**Vegetation – Soil Map of Northern Rhodesia. Trapnell et al. (1947).**
19 Starts with observation that analytical data are very sparse due to retrenchment of the Soil Chemist position. But "possible from the interpretation … of the physiography of the ground, to proceed to a description of the main soil types in terms consistent with those employed for the … East African Soil Map". Four groups identified on a physiographic basis. Provisional ideas on relations to EASM based on comparson of samples with soils of Tankanyika at Amani.	**10** The account of the Regional Soil Types starts with more reflection on general pedological principles than did the earlier report. Three primary factors identified, to which soils owe their characteristics: climate (past and present), parent material and the age of the landsurface and nature of the changes that have taken place in relief. The latter is key in determining maturity of the soil and the extent to which past or present climate influences soil properties. Such effects "cut across the broad zonal arrangement of climatic soil types". PM effects "hard to discern in such ancient soils", but some important effects discernible in younger soils: residual and colluvial soils in some Upper Valley areas … may be very fertile. Allowing for physiography, a climatic sequence can be discerned Plateau (wet, past conditions), UV (drier, current, conditions) LV (pedocal)	**15**. The pedological framework comprises a "Main Series" of soils reflecting climatic (not necessarily contemporary) variation from Lower Valley to Upper Valley to Plateau soils to Red Earths and soils of the Lake Basins. This main series, which includes the soils of interest to us here, was anticipated in the N-E report. Also lithological and hydric series are proposed in parallel.

Upper Valley Soils. **28** These soils were initially differentiated on vegetation "wholly distinct from that of the Plateau soils which surround them". Correlated with *non-calcareous Plains soils* of East African Soil Map, but also include red soils superficially resembling the Red Earths. Contrast from Plateau Soils: lower-lying regions of more modified topography, somewhat broken or rolling country, and freely drained. Particularly associated with limestones and mica schists. Younger residual and colluvial soils, warm pinkish brown to brownish red colour when dry. Sandy loams to finer loams and clay loams. May have iron-coated rock fragments or mottling, but lack ironstone formations. Resemble Lower Valley soils in having a basic reaction in the subsoil. More fertile than Plateau Soils, with a larger degree of base saturation, P and N content.. Could be divided between lighter-coloured and red-brown, but the latter predominate so provisionally divided on vegetation cover.	*Upper Valley Soils* **22**. Reflecting current conditions where land surface is or has recently undergone modifications, and reflecting warmer and drier conditions than the plateau. In the higher parts of the plateau restricted to fringes of streams (e.g. Chinsali district), typical Upper Valley soils from Lundazi district to Fort Jameson (Chipata), Petauke district from 3,000' to the Luangwa. Parent material (calcareous shales, feldspathic schists), may condition their appearance in higher areas. Similar PM to the Red Earths elsewhere (Basement complex rocks in Petauke district). **23** Deeper coloured, heavy loams with pronounced clod structure in contrast with the N-W. Varying from nearly black clay loam (Chipata) to dark-brown, chocolate-brown and chocolate read soils. Contact soils with Red Earths may have some ironstone concretions. Near Chipata contact soils – chocolate-red loams with a coarse sand content and friable consistence over redder clay-loam, of considerable agricultural potential. **24**. These are resistant to erosion but othersin the Petauke district are not. **37**. Indicators of soil fertility. 1. "A recent residual , colluvial or alluvial origin in preference to the older residual types of leached appearance." 2. Parent material: basic or intermediate if igneous/metamorphic, calcareous or felspathic if sedimentary 3. Colour: if residual, "warm red-brown to chocolate-red or chocolate-brown. In colluvial soils "intermediate cocoa-coloured to darker chocolate and chocolate-brown tones", "grading to black in dambos" or similar environments. Other factors relate to texture, structure, organic content, acidity, lack of iron concretions and vegetation.	*Upper Valley Soils* **20**. Plateau soils "give way" to UVS in lower areas of younger relief. "warmer-toned" pink-brown or cocoa-coloured to chocolate/darker brown soils. Correspond to "Non-calcareous Plains Soils" of EASM, may be comparable (in part) to Brown Forest Soils of the Transvaal Low Veld. Associated "limited belts" of soils with affinities for red loams, treated as intrazonal soils. Geologically conditioned. Concretions generally lacking, may be iron-oxide coatings on rock fragments above the bedrock. Increase in base saturation and exchangeable bases with depth than on neighbouring Plateau soils. Lime nodules locally in proximity to stream courses and black swamp clays. Immature soils in areas of broken topography. Lower Petauke district – shallow, stony skeletal phases approaching escarpment hills.

29 Transitional Soils. Vegetation primarily *Combretum* and *Papilionoideae* in particular *Afrormosia* angolensis. Soils regarded as intermediate between Thorn soils and surrounding plateau types. Mainly residual, often immature. Well-drained sandy loams (up to 75% sand). Light, friable, coherence varies. Double the P content of Plateau Soils. Light maize soils, with potential for tobacco and for cotton **30. Thorn soils** Dominated by *Acacia* Mainly colluvial sandy loams. Finer and more coherent than Transitional soils. Certain alluvial soils included with *Acacia* cover. Variable P content, tend to larger N content than others. *Acacia*/grassland Best maize land and dry grazing in the country. **Map Unit:** one "Upper Valley Types" "*Combretum* scrub-woodland on Transitional soils and *Acacia* tree-grassland on Thorn soils." *Combretum-Afrormosia* on chocolate red loams appear on the western margin of the eastern map sheet, and, after 1962, sone on the eastern margin of the western map sheet too.	**63** The *Combretum-Afrormosia* scrub woodland and *Acacia* belts are largely lacking in the east. **64** *Pterocarpus* – *Combretum* vegetation, scrub-woodland or low woodlandf and scrub-grassland are associated with eastern Upper Valley areas. Considerable areas of fertile soil in Petauke and Fort Jameson districts. Light-textured cocoa-coloured to dark brown Upper Valley soils, heavier chocolate-brown to red-brown loams, local black clay loams and some skeletal or immature soils. **Map unit** on the western sheet: *Pterocarpus* – *Combretum* vegetation on Upper Valley soils or associated chocolate red loams	No specific information on contrasts between Transitional and Thorn soils is given in the memoir, but the reader is referred in the account of the vegetation units back to paragraphs in the intermediate reports **Map units:** Vegetation units are in the High Grass-Woodland category. *Combretum* – *Afrormosia* and *Pterocarpus* – *Combretum* transitional vegetation is mapped with Upper Valley soils as is *Acacia* – *Combretum* vegetation. The transitional vegetation is also mapped with chocolate red loams, as introduced in the N-E report. Note that in the version of the map published by Smith and Trapnell (2001), which is based on revised map sheets produced in 1962, this latter unit is introduced into central and western parts of the Upper Valley unit in the Kafue basin, where it was not shown in the map sheets of Trapnell et al (1947).

Red Earths do not appear as a distinct type in the CW report, there is a reference to red soils which resemble them in paragraph 8 on Upper Valley Soils	*Red Earths* **13** treated as a major type here because of their significance in Equatorial regions, but here essentially a variant of Plateau soils. Well developed on certain parent materials. **14** Some "pastel-toned read loams" of the Eastern Plateau included here, fine-grained loams with pink orange-brown or "soft brown red" colour. Derived from Basement schists or gneiss or local intrusive igneous rocks. Grade into chocolate-red loam regarded as a variant of the Upper Valley group.	*Red Earths* in the 1947 map and memoir are explicitly restricted to "deep-red, orange-red and brownish-red clay loam soils" as it was felt that these could be confidently correlated with the Red Earths as mapped by Milne (1936). Occurrence of soils so-described was very limited.
Plateau types Provisional map legend has Northern Plateau types and Southern Plateau Types then with vegetation types. These vegetation types almost all have some soil descriptor attached, but these do not map simply onto the soil classes which are given within the group. **20** *Plateau soils* Some variation in colour and texture, but all are eluvial soils formed by long periods of seasonal leaching on maturely eroded topography. A general tendency to nodular or concretionary ironstone at depth, in proximity to the regolith. This is most pronounced where soils are poorly drained due to flat topography (or over impervious rock or in proximity to a dambo). Lime-free and weakly acid. *Older Ironstone Soils*. Partially denuded soils on older land surfaces. Pallid, shallow soils with clayey to sandy texture. Ferruginous nodules, and concretionary ironstone. Variable parent material, but little associated soil variation. Equivalent to Murram soils of the East African Soil Map Used for finger millet but otherwise "agriculturally useless". Exemplified over Lusaka limestones. *Light Coloured Plateau Soils.*	*Plateau Soils* **15** Pinkish-brown to buff-toned soils, generally of weak structure and with ferruginous pellets or softer concretions in the lower horizons. Massive ironstone concretions not very common. **16** Northern plateau: upland. Very variable, but generally loam to sandy loam and pink-brown to lighter pink-buff in colour. Variations associated with particular parent materials, altitude and topography. **17**. Central plateau: lower-lying. Mainly pallid sandy soils, Upper Valley soils may be associated with dambo fringes. **18.** Eastern plateau: clear and bright colouring, but very variable in texture and reaction due to variation of the parent material. In the south chocolate-brown soils may be found in transition to Upper Valley soils.	*Plateau Soils* Plateau soils of EASM, and Ferruginous Lateritic soils of the Transvaal (van der Merwe). Mature topography of older land-surfaces. Nodule horizon grades into underlying rotted rock, attributable to poor subsoil drainage, also flat topography and intense seasonal rainfall. Acid, base-deficient. Typical profile: buff to light pink-brown light-textured surface soil, greyer in surface, grading to ochreous or orange clay-sand subsoil containing iron nodules or amorphous concretions. May increase in frequency with depth. Typically a thick, packed bed, with associated quartz gravel, may contain massive concretions. Gravel grades into underlying rotted rock. Concretions may be lacking on less mature sites or over certain acid granites. Subgroups: i. Light-coloured sandy loams ii. Pallid grey to white sandy soils over buff-coloured subsoil (central plateau region) comparable to vdM's Grey Ferruginous Lateritic Soils. iii. Pale yellow, yellow, orange clay soils, mainly in the northern plateau of NW Zambia. iv. Truncation by denudation – older ironstone soils with sheets of ironstone nodules or massive concretionary blocks. Comparable to Murram Soils of

Soils of the younger, partially regraded, plateau, varying with with parent material as well as climate. Most extensive subgroup of these Including yellow and orange clays (Northern PS) and orange to pinkish-buff loams extending (from Copper Belt) to sandy buff and other pallid sandy soils on the Southern Plateau. Equivalent to the Plateau Soils on the East African map. *Red and Brown Plateau Soils* More restricted subset of the younger plateau soils deep red residual soils or browner colluvial soils Includes deep red ferruginous non-siliceous clay soils over calcareous PM on Northern Plateau correlated with Red Earths in the East African Soil Map. Includes the most fertile Plateau Soils.		EASM. Similar "relict" soils on the flanks of the Luangwa valley.
Map Units **45. *Isoberlinia paniculata – Brachystegia* woodlands on Sandy soils** Medium woodland. I.p. sometimes with B. longifolia. Smaller belts of B. hockii. Typically pure with sparse Uapaca etc understory. *Over pallid sandy soils*. Variants: Mixed scrub woodland with Parinari and Diplorrhynchus or open clumps of Ip and Uapaca *on shallower old ironstone soils*. B. hockii over *finer and redder loams*. **46. Southern *Isoberlinia globiflora – Brachystegia* woodlands on Sandy Loams** Low Ig typically with B.h. over *pinkish-buff sandy loams* also passing into B. flagristipulata woodland on *poorer soils.* This vegetation is also found on escarpment hills, passing into first variant of 45 or narrow belts of second. True red and brown soils in this area – UV class occupied by Transitional bush	Paragraphs 48 – 57 describe eight different Brachystegia – Isoberlinia woodland units on Plateau Soils	No specific soil references in the veg-units here (P5, P7)

Table S9. The Upper Valley and Southern Plateau Farming systems as described by Trapnell and Clothier (1937).

Numbers in bold refer to paragraphs of Trapnell and Clothier (1937).

Farming system	Where practiced	Vegetation	Management practices	Main crops and Cropping sequence	Land holding size	Cultivation period
Upper Valley System	**Transitional country**	**165.** **Dense scrub woodland adjoining the Plateau**	Scrub cut and burnt in piles	• Finger millet in burnt patches • Main garden: Maize inter-planted with sorghum. Cowpeas and cucurbits under-planted in the maize field • From 2nd year, groundnuts, groundbeans and sweet potatoes planted in new burnt extensions	½ – 1 acre extensions per year reaching maximum of 4 acres within 3 years or more if ploughs available	• Up to 5 years continuous cultivation, then fallow • May return for a further cultivation then left to secondary succession
		166 – 167. **Dambos and dambo margins** Main Upper Valley system in Transitional country		• Sorghum, underplanted cucurbits in grey/black clay loams under *Hyparrhenia rufa* scattered *Acacia campylacantha* • Maize with cowpeas in browner loams in *Hyparrhenia filipendula A. campylacantha* or *A. woodii* • Groundnuts in red-brown sandy loams of *Albizzia struthiophylla* or similar trees at dambo margin. • No maize in dambo where marginal trees are *Combretum/Terminalia* on poor sandy loams • Separate maize garden where there is a broad marginal band of red-brown colluvial soil with *Combretum – Albizzia – Acacia*	Extended from heavier central dambo, 5 – 7 acres. If market and plough (mechanization) available, typically cultivate larger area (by up to 2 acres more)	• Heavier soils with sorghum 6 or 8 years without rest • lighter maize soils 4-5 years • return after finishing 2-3 sites (~12-24 years, 8-15 years?)

		168 **Bush garden**	Land cleared and hoed at end of rainy season, hoed again in dry season	• Maize as main crop or maize with sorghum • in 2nd year ¼– ½ acre planted alongside main field with/without mounded sweet potatoes. Incorporated into main garden in following year.	4 acres, but up to 8 –10 if ploug is used.	5 years cultivation (some land rested while extensions are cultivated). May return after a short fallow.
	Thorn country	**170** *Acacia campylacantha, Acacia albida*	Similar to transitional country but with more large-scale cultivation due to ploughing	• Land prepared after rains, but may be cross ploughed in November for next season • Maize as main crop with some sorghum. Maize planted every 2nd or 3rd furrow of the plough. • But for Ila people (Nalubamba area): no ploughing but hoeing and very small areas (gardens regarded as women's concern). 1 ½ acre of maize and sorghum for 3 years and then bulrush millet for 1-2 years	As above.	As above, dependent on quality of soil
	Transitional sands (Kalahari sand)	• *Burkea-Terminali bush* • *Teak caps* • *Acacia-Terminalia bush* • *Acacia albida*	Burn brushwood in September, hoe land and plant with first rains	• Small gardens: Maize in 1st year then bulrush millet in 2nd – 3rd year • Main garden: Maize with/without groundnuts in 1st year, millet in formerly maize site and maize in the groundnuts site, with groundnuts in new extension in 2nd year. Millet is followed by maize with/without sorghum in 3rd year and then millet again in 4th year.		• 4-5 years cultivation (6-8 years in extended sites), 3-7 years rest • If plain gardens shorter period as no extensions.

Farming system	Where practiced	Vegetation	Key management practices	Site	Main crops and Cropping sequence	Land holding size	Cultivation period
Southern Plateau system	Lenje and Mashaha tribes– Central region **121 – 123** Mashasha particularly on poorer Kalahari contact soils	*Isoberlinia paniculata-Brachystegia* woodland over sandy soils	Felled tree branches piled and burnt. Hoeing of entire cleared land	Main garden	• Sorghum in main garden with/without little maize in 1st year. • 2nd–3rd year: Extend main sorghum garden and also plant maize, pumpkins on burnt sites. • Groundnuts, sweet potatoes, ground beans on un-burnt sites • Near railway on better soils passing to UV, more extensive maize production	2-4 acre per head, gardens extended annually by 0.5-1 acre with similar size of first land abandoned. Mashasha extend more rapidly in larger blocks, may be up to 6 acre	2 – 3 years among Mashasha Move to a new block in 6 – 9 years 3 – 4 years among Lenje
				Village garden	• ½ – ¾ acre per woman of mostly maize with little sorghum, pumpkins and cucurbits • Extend annually by planting 1/8 – ¼ sweet potatoes and cassava on mounds. Then maize in subsequent years		
	Tonga-Southern **124 – 125**	*I. globiflora*		Main garden	Mostly as above with following variations: • Greater maize proportion with sorghum in main garden. Maize up to 3rd year if soil still good. • Finger millet in ash patches • Livingstone potatoes on un-burnt portions when sufficiency of other crops has been planted	As above	3 years for cereals and 1 year for mixed cropping (which are then converted to cereal production)

							• 1-3 fallow and may return for further 2 years cultivation • Typically 6-9 years total cultivation with extension before moving to new village/site
				Village gardens /old village	• Groundnut-finger millet, subsequent years with maize and bulrush millet (no sorghum). Bulrush millet then rotated with maize or sorghum • If old village, sorghum and maize for 3-4 years		Cultivation more or less continuous (as long as village exists) 3-4 years if old (previous?) village
	Local variations			Moist hilly zones, bracken-fringed peaty hollows	• Dambo cultivations with increased maize proportion • Pre-rain season cultivation		

Table S10. Table of botanical synonymy.

The text of the article uses the botanical names substituted for vernacular names in Smith's and Trapnell's (2001) publication of the traverse records. This table gives the corresponding names as in the *Flora of Zambia* (accessed online at https://www.zambiaflora.com/ on 26/9/23). Any third name following the binomial indicates a subspecies, or a variety if preceded by *v.* In some cases the reference in the records uses the genus name only. If only one species is references in Smith's and Trapnell's (2001) Table of Synonymy, then that species is named in full. Otherwise the genus only is given if modern synonyms are all in a single genus. For ease of reference the entries are in alphabetical order by the name in the transcribed records and key Families/Subfamilies are distinguished by colour as below

Fabaceae/Mimosoideae	Legumes: acacias and relations
Fabaceae/Papilionoideae	Legumes: pea subfamily
Fabaceae/Caesalpinioideae	Legumes: peacock flower subfamily
Combretaceae	Combretums
Poaceae	Grasses and reed grasses

Name in the transcribed field records (Smith and Trapnell, 2001) and the text of this article.	**Name in Smith's and Trapnell's (2001) Table of Synonymy (Vol 1, pp 14–16)**	**Name in *Flora of Zambia***	**Family/Subfamily**
Acacia albida	*Faidherbia albida*	*Faidherbia albida*	*Fabaceae/Mimosoideae*
Acacia campylacantha	*Acacia polyacantha campylacantha*	*Acacia polyacantha campylacantha*	*Fabaceae/Mimosoideae*
Acacia hebecladoides	*Acacia gerrardii*	*Acacia gerrardii v. gerrardii*	*Fabaceae/Mimosoideae*
Acacia welwitschii	—	*Acacia goetzei goetzei*	*Fabaceae/Mimosoideae*
Acacia woodii	*Acacia sieberiana v. woodii*	*Acacia sieberiana v. woodii*	*Fabaceae/Mimosoideae*
Acroceras macrum	—	*Acroceras macrum*	*Poaceae*
Afrormosia angolensis	*Pericopsis angolensis*	*Pericopsis angolensis*	*Fabaceae/Papilionoideae*
Afzelia	—	*Afzelia*	*Fabaceae/Caesalpinioideae*
Albizzia a[n?]tunesiana	—	*Albizzia antunesiana*	*Fabaceae/Mimosoideae*
Albizzia struthiophylla	*Albizzia amara*	*Albizzia amara*	*Fabaceae/Mimosoideae*
Aristida	—	*Aristida*	*Poaceae*
Bauhinia thonningii	—	*Piliostigma thonningii*	*Fabaceae/Caesalpinioideae*

Brachiaria rugulosa	—	*Brachiaria rugulosa*	*Poaceae*
Brachystegia flagristipulata	*Brachystegia boehmii*	*Brachystegia boehmii*	*Fabaceae/Caesalpinioideae*
Brachystegia hockii	*Brachystegia spiciformis*	*Brachystegia spiciformis*	*Fabaceae/Caesalpinioideae*
Brachystegia longifolia	—	*Brachystegia longifolia*	*Fabaceae/Caesalpinioideae*
Brachystegia mimosifolia	*Brachystegia taxifolia*	*Brachystegia taxifolia*	*Fabaceae/Caesalpinioideae*
Brachystegia tamarindoides	*Brachystegia glaucescens*	*Brachystegia glaucescens*	*Fabaceae/Caesalpinioideae*
Canthium malacocarpum	*Psydrax kraussioides*	*Psydrax kraussioides*	*Rubiaceae*
Combretum guenzii	*Combretum molle*	*Combretum molle*	*Combretaceae*
Copaifera mopane	*Colophospermum mopane*	*Colophospermum mopane*	*Fabaceae/Caesalpinioideae*
Coreopsis steppis	—	*Bidens sp*[1]	*Asteraceae*
Cynodon dactylon	—	*Cynodon dactylon*	*Poaceae*
Dalbergia	*Dalbergia*	*Dalbergia*	*Fabaceae/Papilionoideae*
Dichrostachys nyassana	*Dichrostachys cinerea*	*Dichrostachys cinerea*	*Fabaceae/Mimosoideae*
Digitaria uniglumis	*Digitaria diagonalis*	*Digitaria diagonalis*	*Poaceae*
Diplorrhynchus mossambicensis	*Diplorrhynchus condylocarpon*	*Diplorrhynchus condylocarpon*	*Apocynaceae*
Erythrophloeum	*Erythrophloeum*	*Erythrophleum*	*Fabaceae/Caesalpinioideae*
Erythrophloeum africanum	—	*Erythrophleum africanum*	*Fabaceae/Caesalpinioideae*
Gymnosporia	*Maytenus*	*Maytenus*	*Celastraceae*
Heteropogon	—	*Heteropogon*	*Poaceae*
Hyparrhenia cymbaria	—	*Hyparrhenia cymbaria*	*Poaceae*
Hyparrhenia filipendula	—	*Hyparrhenia cymbaria*	*Poaceae*
Hyparrhenia rufa	—	*Hyparrhenia rufa*	*Poaceae*
Hyparrhenia ruprechtii	*Hyperthelia dissoluta*	*Hyperthelia dissoluta*	*Poaceae*
Isoberlinia globiflora	*Julbernadia globiflora*	*Julbernadia globiflora*	*Fabaceae/Caesalpinioideae*
Isoberlinia paniculata	*Julbernadia paniculata*	*Julbernadia paniculata*	*Fabaceae/Caesalpinioideae*
Lonchocarpus	—	*Philenoptera*	*Fabaceae/ Papilionoideae*
Lonchocarpus capassa	—	*Philenoptera violacea*	*Fabaceae/ Papilionoideae*
Ostryoderris stuhlmannii	*Xeroderris stuhlmannii*	*Xeroderris stuhlmannii*	*Fabaceae/ Papilionoideae*
Panicum maximum	—	*Panicum maximum*	*Poaceae*
Panicum plagiathum	*Panicum nervatum*	*Panicum nervatum*	*Poaceae*
Parinari mobola	*Parinari curatellifolia*	*Parinari curatellifolia*	*Chrysobalanaceae*
Phragmites	—	*Phragmites*	*Poaceae*
Phyllanthus engleri	—	*Phyllanthus engleri*	*Phyllanthaceae*

Pterocarpus	*Pterocarpus*	*Pterocarpus*	*Fabaceae/ Papilionoideae*
Pterocarpus martinii	*Pterocarpus rotundifolius*	*Pterocarpus rotundifolius*	*Fabaceae/ Papilionoideae*
Setaria	*Setaria*	*Setaria*	*Poaceae*
Setaria ciliota	—	*Setaria incrassata*	*Poaceae*
Setaria phragmatoides	*Setaria incrassata*	*Setaria incrassata*	*Poaceae*
Terminalia	*Terminalia*	*Terminalia*	*Combretaceae*
Terminalia rhodesica	*Terminalia stenostachya*	*Terminalia stenostachya*	*Combretaceae*
Trichopteryx simplex	*Loudetia simplex*	*Loudetia simplex*	*Poaceae*
Trichopteryx superba	*Tristachya superba*	*Tristachya superba*	*Poaceae*
Uapaca kirkiana	—	*Uapaca kirkiana*	*Phyllanthaceae*
Uapaca nitida	—	*Uapaca nitida*	*Phyllanthaceae*
Vangueriopsis	—	*Vangueriopsis*	*Rubiaceae*

[1]Species *B. steppis* not found in Flora of Zambia or any other source