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JESS *Juba Environmental and
Socioeconomic Studies*
Daraasaadka Dooxada Jubba

A project of
Ministry of Juba Valley Development
U S Agency for International Development
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PN-ABK-527

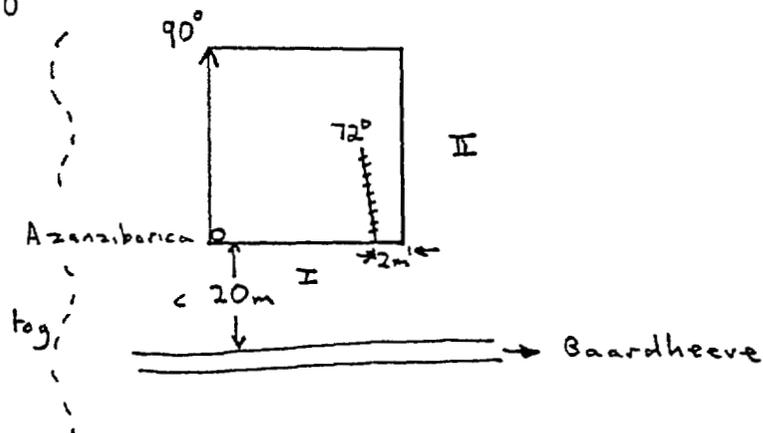
VEGETATION MONITORING SITES

SITE NUMBER 1

Location. 10 km from Baardheere Bridge on 285°
2°22'N, 42°12'E
Established 18 July 1986

Directions 0, W end Baardheere Bridge, 0 25, turn left,
1 7, turn left through Buulo Kulun village
picking up well established track,
10 2, site to right of track after crossing tog,
before descending into second tog

Layout 20 x 20



Markers for relocation: Large magacalawe tree on edge of
tog 36 4 m on 98°

Description

Gentle, stony limestone slope towards seasonal stream bed
Site and tog backflooded from river in gu' 87.

Not close to human settlement.

Seasonally heavily browsed and grazed, substantial wood
cutting Tsetse reportedly absent

Soil Deep, surface cracking with some sand grains Hard
angular peds breaking to silty sand, slightly sticky,
moderately plastic

Sandy clay loam. Color (dry) 10YR 6/4

Plant Species On and Around Site

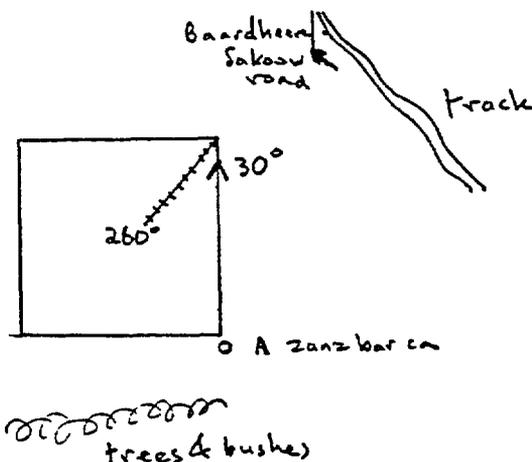
<i>Acacia reficiens</i>	4-5m	ab
<i>Acacia mellifera</i>	4-5m	ab
<i>Dobera glabra</i>	6-7m	com
<i>Acacia zanzibarica</i>	8-10m	ab
<i>Cordia sinensis</i>	2-3m	com
<i>Grewia tenax</i>	1m	occ
<i>Elaeodendron aquifolium</i>	2-3m	occ
<i>Balanites</i> sp	2m	occ
<i>Commiphora</i> sp	4m	com
<i>Hyphaene</i> sp (seedlings)	1m	rare
<i>Dichrostachys cinerea</i>	2m	occ
<i>Acalypha fruticosa</i>	2m	com
<i>Tamarix aphylla</i>	2m	com
<i>Ziziphus</i> sp	10m	occ
<i>Spirostachys venenifera</i>	2m	com
<i>Thespesia danis</i>	2m	com
<i>Combretum hereroense</i>	4m	occ
3 unidentified species		
<i>Echinochloa haploclada</i>	1m	com
<i>Sporobolus helvolus</i>	0 5m	occ
<i>Dactyloctenium</i> sp	0 5m	occ
<i>Ruellia patula</i>	prostrate	occ

SITE NUMBER 2

Location 3 km from Saakow on 320°
1°40'N, 42°26'E
Established 20 July 1986

Directions 0, Saakow market; 4 5, on Baardheere road turn right through village, 0 8, bear right to dhesheeg, 0 4, to site.

Layout. 20 x 20



Markers for relocation SITE CULTIVATED DURING JESS

Description

Extensive depression partly cultivated (including flood recession) with rice, maize, sorghum, sesame, onions, sugar cane, beans, greens
Flooded in gu' 87.

Substantial grazing in jillaal, tsetse present.

Soil Deep, small flaky surface peds formed by flood recession, moderately hard sub-angular peds below surface breaking to crumbs and fine particles, slightly sticky, moderately plastic

Clay loam/silty clay loam Color (dry) 5YR 3/3.

Plant Species On and Around Site

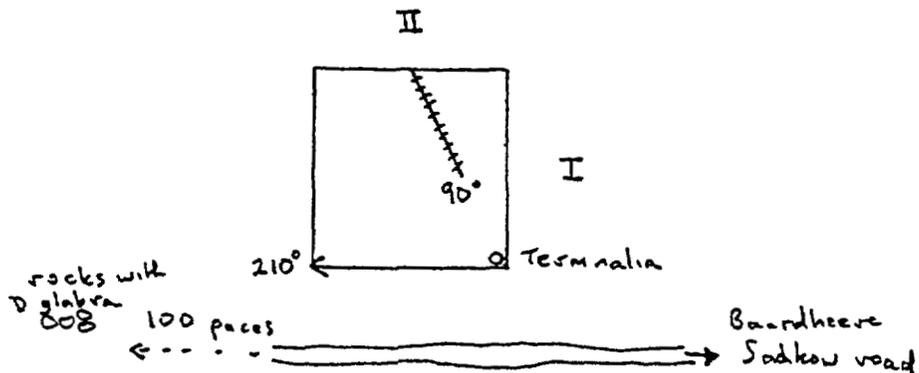
<i>Hyphaene</i> sp. (seedlings)	1m	rare
<i>Acacia zanzibarica</i>	10m	occ
<i>Cordia sinensis</i>	5m	rare
<i>Dichrostachys cinerea</i>	1m	occ
<i>Phyllanthus somalensis</i>	2m	ab
<i>Sesbania bispinosa</i>	4m	occ
<i>Terminalia brevipes</i>	4m	com
<i>Spirostachys venenifera</i>	4m	rare
<i>Sporobolus helvolus</i>	0 5m	dom
<i>Sorghum arudinaceum</i>	1 5m	com
<i>Cucumis dipsaceus</i>	0 3m	rare
<i>Abutilon hirtum</i>	1 5m	occ
<i>Indigofera schimperi</i>	0 6m	rare
<i>Tephrosia subtriflora</i>	0 4m	rare

SITE NUMBER 3

Location. 1 km from Gurmeyso on 135°
1°41'N, 42°55'E
Established 20 July 1986

Directions Saakow-Baardheere road; 1 4, S of Gurmeyso,
track to right with Y entrance, knotted *Dobera glabra* in
arms of Y At fork bear left, site on right 0 3 from main
road
(If stony area with *Dobera* reached, go back 100 paces)

Layout 20 x 20



Markers for relocation Hole at right side of track 100
paces from fork Site 60m on 287° from site

Description

~flat level plain above floodplain

Not close to human settlement.

Heavily grazed over time, substantial wood cutting No site
interview.

Soil: Deep, thin surface flakes and sand particles Beneath
weak peds break to crumbs and dust Not sticky, moderately
plastic.

Clay loam. Color (dry) surface flakes 7 5YR 6/6,
below 5YR 4/4

Plant Species On and Around Site

<i>Terminalia parvula</i>	4m	com
<i>T. brevipes</i>	4m	com
<i>Thespesia danis</i>	0 6m	com
<i>Acacia reficiens</i>	3-4m	ab
<i>A mellifera</i>	1m	rare
<i>Grewia villosa</i>	0 4m	rare
<i>G. tenax</i>	1m	rare
<i>Combretum contractum</i>	4m	com
<i>Cordia sinensis</i>	2m	rare
<i>Albizia anthelmintica</i>	6m	com
<i>Dobera glabra</i>	4m	occ
<i>Commiphora sp</i>	2 5m	rare
<i>Aloe sp</i>	0 2m	rare
<i>Edithcolea grandis</i>	0 1m	occ
<i>Cleome brachycarpa</i>	0 1m	occ
<i>Adenium sp</i>	0 1m	rare
Prickly Acanthaceae	0 3m	ab

SITE NUMBER 4

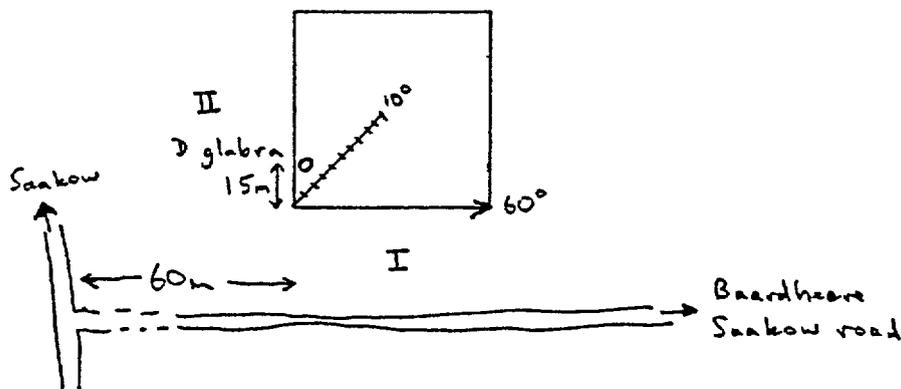
Location 8 km from Saakow on 170°

1°34'N, 42°28'E

Established 21 July 1986

Directions 0, beginning of graded ag project graded road running ~ S; 3 2, road turns left - continue straight on unmade track, 3 4, Arbaay village cross road continue straight, 7 9 take track to left (leads eventually to Saakow-Bu'aale road), site 50 paces on left

Layout 20 x 20



Markers for relocation Hole on side of track next to site
Site 7 2 m on 310° from hole

Description

Ancient levee, no longer in floodplain (87 flood within 50m)

Not close to human settlement

Heavy grazing over time, little sign of wood cutting, tsetse present

Soil. Deep, surface has weak flakes and sand grains No peds, breaking to crumbs and sand Not sticky, moderately plastic

Sandy loam/sandy clay loam Color (dry) surface 7 5YR 4/4
below 5YR 4/4

Plant Species On and Around Site

<i>Dobera glabra</i>	4m	ab
<i>Grewia tenax</i>	2m	com
<i>G. villosa</i>	0 8m	rare
<i>Acacia reficiens</i>	4m	ab
<i>A mellifera</i>	0 4m	rare
<i>A horrida</i>	3m	occ
<i>Commiphora sp</i>	4m	occ
<i>Cordia sinensis</i>	4m	com
<i>Combretum contractum</i>	3m	ab
<i>Salvadora persica</i>	5m	rare
<i>Terminalia sp</i>	3m	rare
<i>Sesamothamnus busseanus</i>	1 5m	rare
<i>Sericocmopsis pallida</i>	1m	rare
<i>Celosia polystachia</i>	1 5	rare
<i>Premna resinosa</i>	1 5	ab
<i>Sporobolus helvolus</i>	0 4m	com
<i>Seddera bagshawei</i>	0 2m	rare
<i>Cadaba glandulosa</i>	1m	occ

SITE NUMBER 5

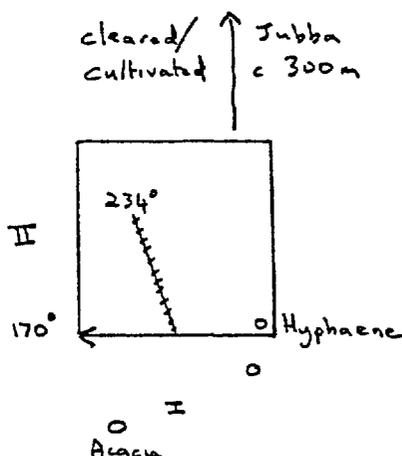
Location 15.5 km from Saakow on 110°

1°30'N, 42°28'E.

Established 22 July 1986.

Directions 0, Saakow petrol station on Bu'aale road, 18.2 turn right on track at S end of "wet weather diversion" with isolated Dobera, 21.3 track ends at river bank

Layout 20 x 20



Markers for relocation Corner Hyphaene 190 paces from end of track on 60°

Description

Flat area on levee, former field site c 15 years before (new clearance between site and river in 88)

Floods often (including gu' 87) Said to have burned jilaal 85.

Not close to current settlement

Fairly heavy grazing in jilaal, nearby charcoal kiln remnants

Soil Deep; surface cracked with loose crumbs Weak sub-angular peds breaking to crumbs Very slightly sticky, plastic

Clay loam/sandy clay loam Color (Slightly moist) 5YR 3/3.

Plant Species On and Around Site

<i>Acacia reficiens</i>	3m	rare
<i>A. nilotica</i>	6m	occ
<i>A elatior</i>	10m	occ
<i>Hyphaene sp</i>	16m	occ
<i>Phyllanthus somalensis</i>	2m	ab
<i>Thespesia danis</i>	4m	rare
<i>Spirostachys venenifera</i>	3m	occ
<i>Terminalia brevipes</i>	3m	com
<i>Sporobolus helvolus</i>	0 8m	dom
<i>Commelina sp</i>	0 2m	ab
<i>Indigofera schimperı</i>	0 8m	rare

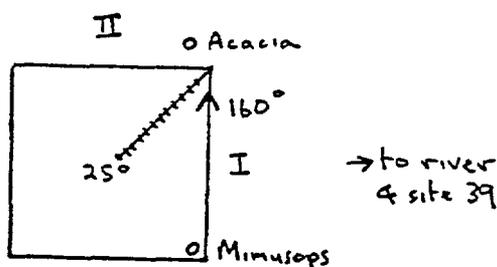
SITE NUMBER 6

Location 20 km from Saakow on 190°
1°28'N, 42°25'30"E

Established 22 July 1986

Directions 0, Saakow petrol station, Bu'aale road, (18 2 turn for site 5), 21 8 turn right, 26 2 Sukayala village continue straight for Gol Janno village at 28 9, continue through dense vegn to 30.7 at edge of cultivation, turn S site at 31 0

Layout 20 x 20



Markers for relocation Large isolated *Mimusops* at corner, large *Acacia* marks second corner approximately,

Description

Uncultivated section of *dhesheeg*, reportedly cultivated c. y years earlier.

Flooded to c 2m standing water gu' 87 Empty of water after c 6 months.

Diverse grain, vegetable, fruit, sesame, tobacco cropping in other parts of *dhesheeg*

Heavily grazed in dry years mainly by village related agropastoral stock Tsetse present

Soil Deep, surface loose crumbs beneath litter. Weak sub-angular peds breaking to crumbs Slightly sticky, moderately plastic/plastic

Clay loam Color (almost dry): 7 5YR 3/2

Plant Species On and Around Site

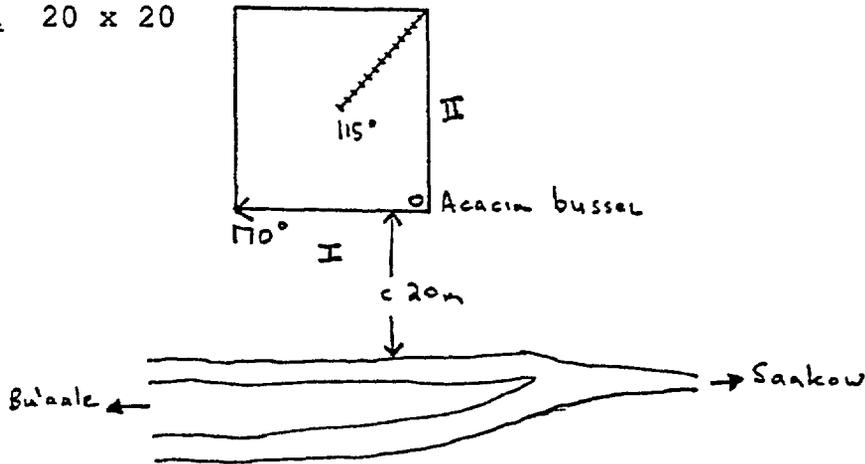
<i>Mimusops fruticosa</i>	20m		occ	
<i>Acacia eliator</i>	20m		com	
<i>Thespesia danis</i>	4m		com	
<i>Hyphaene</i> sp. (adult)		15m		occ
<i>Hyphaene</i> sp (seedlings)	1m		occ	
<i>Phoenix</i> sp (seedlings)	1	5m	rare	
<i>Lawsonia inermis</i>	4m		occ	
<i>Indigofera schimperi</i>	2m		com	
<i>Clerodendrum</i> (?acerbianum)	3m		com	
<i>Terminalia brevipes</i>	2	5m	occ	
<i>Sporobolus helvolus</i>	0	4m	dom	
<i>Sorghum arudinaceum</i>	1m		com	

SITE NUMBER 7

Location 19.6 km from Saakow alongside Bu'aale road.
1°29'N, 42°30'E.
Established 23 July 1986.

Directions 0, Saakow petrol station on road to Bu'aale, 19.6, conspicuous fork for "wet weather diversion" - take less sandy track to right. Site to right of this track near beginning.

Layout 20 x 20



Markers for relocation Hole at side of track, 22.5m on 295° to site

Description

Flat, sandy plain of ancient alluvium away from current floodplain

Not close to settlement.

Heavy grazing, little browsing or wood cutting

Soil Deep, surface loose crumbs, flakes and sand grains with some cracking. Weak peds crumbling easily. Very slightly sticky, moderately plastic

Coarse sandy clay loam. Color (dry) surface 5YR 6/1
below 5 YR 5/1

Plant Species On and Around Site

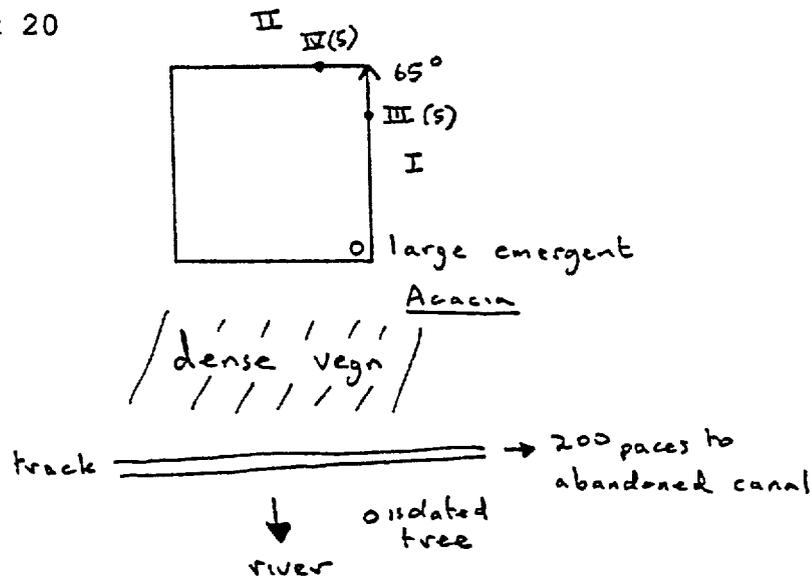
<i>Acacia bussei</i>	4m	dom
<i>A. etbaica</i>	3m	occ
<i>A nubica</i>	1m	occ
<i>Albizia anthelmintica</i>	5m	occ
<i>Cordia sinensis</i>	2m	occ
<i>Combretum contractum</i>	2m	occ
<i>Thespesia danis</i>	1 5m	occ
<i>Dobera glabra</i>	4m	occ
<i>Grewia tenax</i>	1m	rare
<i>G villosa</i>	0 8m	rare
<i>Maerua sp</i>	5m	rare
<i>Sporobolus helvolus</i>	0 5m	com
<i>Dactyloctenium scindicum</i>	0 3m	ab
<i>Tetrapogon villosus?</i>	0 1m	ab
<i>Eragrostis cilianensis</i>	0 1m	com
<i>Commelina sp</i>	0 1m	com
<i>Tribulus sp</i>	prostrate	occ
<i>Asparagus sp</i>	1m	rare
<i>Barleria ramulosa</i>	0 3m	occ
<i>Seddera bagshawei</i>	0 2m	com
<i>Indigofera schimperii</i>	0.4m	rare
<i>Cadaba sp</i>	0.3m	rare
<i>Hermannia exappendiculata</i>	0 3m	occ

SITE NUMBER 8

Location 5 km from Bu'aale on 195°
1°13'N, 42°34'E.
Established 24 July 1986

Directions 0, Bu'aale police station, take road S, 4 6,
turn right along S side of abandoned canal, 8 3, river edge
with canal headworks Site c 150m N across canal

Layout 20 x 20



Markers for relocation: (description missing) walk along track between river bank and forest for c 200 paces, then enter forest near isolated tree along path. Corner marked by large emergent Acacia

Description

~ flat with large termite mounds.

Flooded gu' 87

Not close to settlement, untouched small patch of primary forest with undergrowth comprising young trees, shrubs and lianes

Soil Deep, surface covered with leaf and wood litter No peds, breaks to crumbs. Non sticky, slightly plastic Humic loam Color (slightly moist): 7 5YR 3/2.

Plant Species On and Around Site

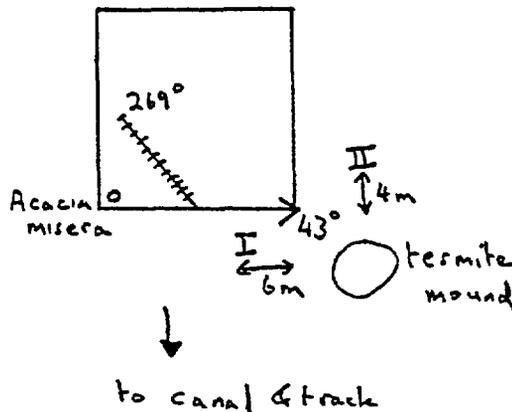
<i>Acacia circummarginata</i> ?	20m	Relative abundance
<i>Lecaniodiscus fraxinifolius</i>	20m	difficult visually,
<i>Rinorea elliptica</i>	6m	see WOODYFP database
<i>Saba comorensis</i>	liane	for details
<i>Pleiocarpa pycnantha</i>		
<i>Cordia goetzei</i>	30m	
<i>Camptoplepis ramiflora</i>	25/30m	
<i>Newtonia erlangeri</i>	30m	
<i>Polysphaeria multiflora</i>	25m	
<i>Phyllanthus</i> sp	3m	
<i>Cola</i> sp nov		
<i>Acalypha fruticosa</i>	4m	
<i>Hyphaene</i> sp (seedlings)	1m	
<i>Thespesia danis</i>	7m	

SITE NUMBER 9

Location: 4.5 km from Bu'aale on 180°
1°13'N, 42°34'E
Established 24 July 1986

Directions: As for site 8, drive along dry canal until 69,
(0.1 beyond footpath cutting through canal) Cross canal,
site c 150m into bush, site c 5m SE of large termite
mound.

Layout 20 x 20



Markers for relocation: description missing, see
"Directions" and "Layout"

Description

Flat sandy plain of ancient alluvium above current
floodplain

Not close to human settlement.

Seasonally moderately browsed, heavy long-term grazing, much
wood cutting Much *Odontotermes* activity

Soil. Deep, surface has thin layer of sand grains Readily
breaks to crumbs Non-sticky, moderately plastic
Sandy loam Color (dry) 5YR 3/3

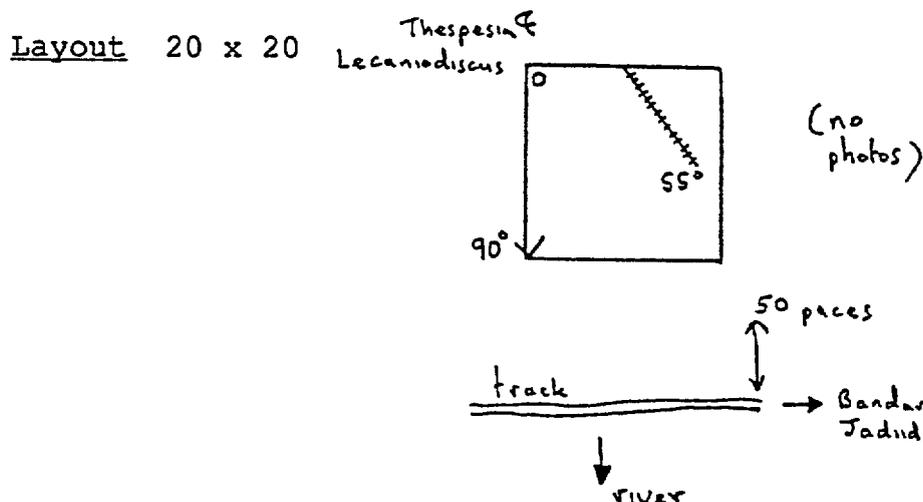
Plant Species On and Around Site

<i>Dobera glabra</i>	5m	occ
<i>Acacia bussei</i>	5m	com
<i>A senegal</i>	4m	com
<i>Cordia sinensis</i>	4m	occ
<i>Commiphora boiviniana</i>	4m	occ
<i>Commiphora sp</i>	5m	rare
<i>Combretum contractum</i>	4m	occ
<i>Salvadora persica</i>	2m	rare
<i>Premna resinosa</i>	2m	ab
2 species unident <i>Cadaba</i>	2m	rare/occ
<i>Grewia villosa</i>	1m	occ
<i>G tenax</i>	2m	occ
<i>Vepris glomerata</i>	2m	occ
<i>Thespesia danis</i>	2m	occ
<i>Adenium obesum</i>	3m	rare
<i>Opilia campestris</i>	3m	occ
<i>Satanocrater paradoxus</i>	2m	occ
<i>Tetrapogon villosus</i>	0 1m	com
<i>Sporobolus helvolus</i>	0 3m	com
<i>Dactyloctenium scindicum</i>	0 2m	ab
<i>Cyperus teneriffae</i>	0 1m	com
<i>Sasivieria sp</i>	1m	com
<i>Cadaba glandulosa</i>	1m	com
<i>Seddera bagshawei</i>	0 2m	occ

SITE NUMBER 10

Location 17.5 km from Bu'aale on 175° (W side of river)
1°6'N, 42°35'E
Established 25 July 1986

Directions 0, W end Bu'aale bridge continue W, 8.5 turn left (S) at cross road. Pass roads on left to Banta and Buurfuule, take third major track on left to Qardhaale village, turn right (S) in Qardhaale and pass Bandar Jadiid, keep left 0.8 km past village, 1.5 km past village, site is c 50 paces on left of track



Markers for relocation cleared for cultivation in 88

Description

River bank alluvium c 100m from river with cultivation in between.

Flooded gu' 87

Heavily grazed in jillaal by nomads. Much new clearance in this area.

Soil: Deep, loose crumbs and plant litter Very weak peds break to crumbs and sand Non sticky, very slightly plastic Fine loamy sand Color (dry). 5YR 3/4.

Plant Species On and Around Site

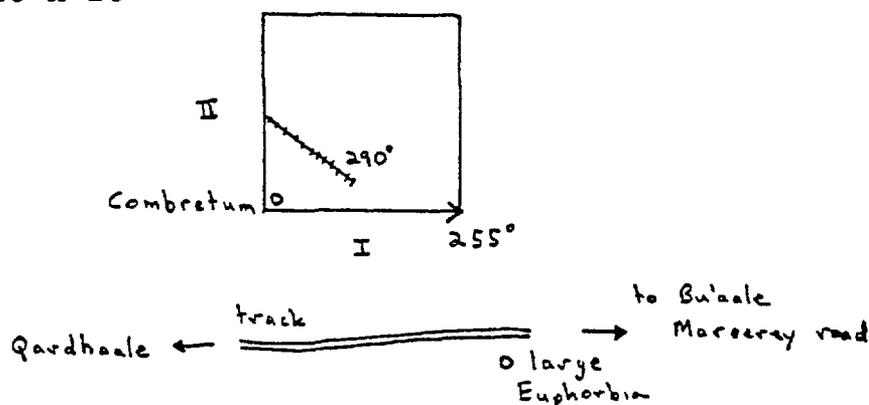
<i>Thespesia danis</i>	5-6m	com
<i>Lecaniodiscus fraxinifolius</i>	6m	occ
<i>Coffea rhamnifolia</i>	3m	com
<i>Phyllanthus somalensis</i>	1m	ab
<i>Ochna ovata</i>	4m	occ
<i>Lawsonia inermis</i>	5m	occ
<i>Cissus quadrangularis</i>	2m	rare
<i>Ormocarpum kirkii</i>	4m	occ
<i>Maerua</i> sp	2m	occ
<i>Albizia anthelmintica</i>	8m	occ
<i>Combretum aculeatum</i>	1m	com
<i>Sporobolus nervosus</i>	1m	dom
<i>S helvolus</i>	0 5m	com
<i>Cenchrus ciliaris</i>	1.7m	com
<i>Dactyloctenium scindicum</i>	0.2m	com
<i>Setaria</i> sp	1 8m	com
<i>Commelina</i> sp	0 2m	occ
<i>Ipomoea pesti-gridis</i>	0 2m	rare
<i>Indigofera brachynema</i>	0 3m	com

SITE NUMBER 11

Location: 15.4 km from Bu'aale on 179°
1°7'N, 42°34'30"E.
Established 25 July 1986

Directions: See site 10, site 11 is 0.7 km W of Qardhaale on road to Bu'aale, left side of road before large *Euphorbia* on right

Layout 20 x 20



Markers for relocation: Hole at roadside 13m on 163° from site

Description

Flat ancient alluvium above floodplain Proximity to village has led to substantial wood cutting Moderate grazing, little browsing.

Soil: Deep, surface fine cracks, thin flakes and loose sand grains with some plant litter. Weak irregular peds. Non sticky, very slightly plastic.

Fine sandy loam. Color(dry)· 2.5YR 5/2

Plant Species On and Around Site

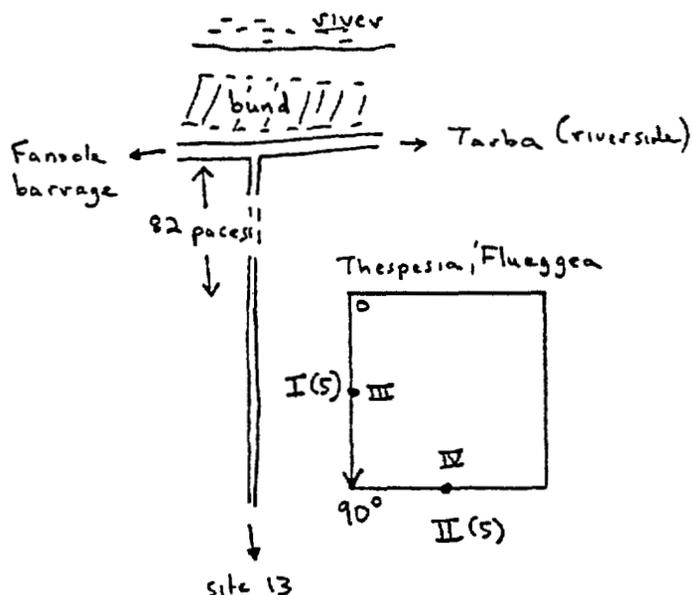
<i>Caesalpinia trothii</i>	2.5m	ab
<i>Anisotes trisulcus</i>	1 5m	com
<i>Dobera glabra</i>	4m	occ
<i>Acacia bussei</i>	4m	com
<i>A. reficiens</i>	3m	ab
<i>Euphorbia robecchii</i>	6m	rare
<i>Euphorbia</i> sp	2m	rare
<i>Croton</i> sp	2m	com
<i>Thespesia danis</i>	4m	occ
<i>Combretum hereroense</i>	3m	com
<i>Terminalia brevipes</i>	4m	occ
<i>Terminalia parvula</i>	3m	occ
<i>Grewia villosa</i>	2m	com
<i>G. tenax</i>	2m	occ
<i>Cordia sinensis</i>	3m	com
<i>Adenia globosa</i>	4m	rare
<i>Newtonia erlangeri</i>	4m	rare
<i>Sporobolus ioclados</i>	0 4m	dom
<i>Dactyloctenium scindicum</i>	0 2m	occ
<i>Tragus heptaneuron</i>	0 2m	ab
<i>Urochloa panicoides</i>	0 3m	ab
<i>Commelina</i> sp.	0 1m	occ
<i>Sansevieria</i> sp	1m	rare
<i>Aerva lanata</i>	0 3m	rare
<i>Cadaba glandulosa</i>	0 3m	rare
<i>Capparid</i>	1 5m	occ
<i>Seddera bagshawei</i>	0 1m	com
<i>Barleria ramulosa</i>	0 3m	occ

SITE NUMBER 12

Location 7km from Fanoole Barrage on 7°
0°48'30"N, 42°40'E
Established 27 July 1986

Directions: N along eastern floodbund upstream along barrage for c 6.5km to Tarba village, leave bund and double back along its landward side 0.6 km to track on left. Site is c 60m paces along this track, on left. (Tarba can also be approached taking the Bu'aale road N of barrage).

Layout: 10 x 10



Markers for relocation: 82 paces along track from bund on 30°, from that point 6.6m on 80° to site.

Description

Dhesheeg cultivated up to 8-10 years ago. No longer floods due to Fanoole bunds

Situated close to split villages of Tarba, but relatively undisturbed since abandoned for cultivation.

Soil Deep, hard, smooth surface with cracks and a few sand grains. Small angular peds breaking to crumbs. Slightly sticky, moderately plastic.

Sandy clay loam. Color (~dry) 7.5YR 4/4.

Plant Species On and Around Site

<i>Dichrostachys cinerea</i>	4m	dom
<i>Thespesia danis</i>	4m	com
<i>Phyllanthus somalensis</i>	4m	com
<i>Flueggea virosa</i>	2m	occ
<i>Acacia nilotica</i>	4m	occ
<i>A zanzibarica</i>	5m	rare
<i>Hyphaene</i> sp (seedlings)	1m	occ
<i>Parkinsonia aculeata</i>	3m	occ
<i>Terminalia brevipes</i>	2-3m	occ
<i>Dobera glabra</i>	2m	rare
<i>Harrisonia abyssinica</i>	2m	occ
<i>Allophyllus rubifolius</i>	3m	occ
<i>Veronia hildebrandtii</i>	2m	occ
<i>Cenchrus ciliaris</i>	1m	com

SITE NUMBER 13

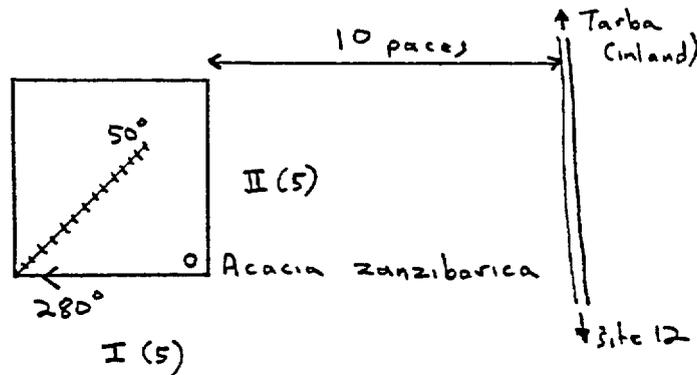
Location: 7km from Fanoole barrage on 11°

0°48'30"N, 42°40'E.

Established 27 July 1986

Directions As for site 12, but continue a further 700 paces (0.5km) along track, site to left of track

Layout: 10 x 10



Markers for relocation Hole by left side of track 8.6m on 324° from site.

Description

Same *dhesheeg* as site 12, but not cultivated in memory of informants

Close to part of Tarba village. Substantial wood cutting, but little grazing or browsing.

Soil: Deep, no distinct surface layer, cracking and some sand grains Weak sub-angular peds breaking to crumbs

Slightly sticky, plastic

Sandy clay/clay loam. Color (slightly moist) surface 10 5YR

6/2

beneath 7 5YR 4/4

Plant Species On and Around Site

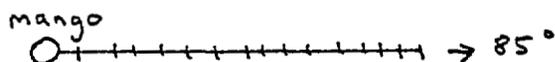
<i>Acacia zanzibarica</i>	7-8m	dom
<i>A. nilotica</i>	7-8m	sub-dom
<i>A. reficiens</i>	3m	occ
<i>Combretum contractum</i>	4m	occ
<i>Dichrostachys cinerea</i>	4m	com
<i>Schoenfeldia transiens</i>	1m	ab
<i>Echinochloa haploclada</i>	1m	occ
<i>Pavonia propinqua</i>	1m	rare
<i>Commelina</i> sp.	0 1m	com
<i>Abutilon pannosum</i>	0 6m	com

SITE NUMBER 14

Location 9.5 km from Jilib on 330°
0°12'N, 42°42'E
Established 5 August 1986

Directions: 0, bridge over Fanoole canal on N edge of Jilib,
2.5, fork left, 6.0, Madhooka village, 10.2, take small
track left to 11.0, site beginning under large mango trees

Layout 50m line transect.



(no photos)

Markers for relocation site cleared for cultivation during
JESS.

Description

~Flat levee c 10m from river.
Floods occasionally including gu' ~1981 and 1987, burned
jillaal 1987.
Close to cultivations.
Soil: ~hidden by grass litter. Deep, hard; no peds,
crumbles. Sticky and plastic.
Clay loam. Color (moist) 7.5YR 3/2

Plant Species On and Around Site

<i>Acacia nilotica</i>	1 5m	rare
<i>Echinochloa haploclada</i>	1 5m	dom
<i>Panicum maximum</i>	3 5m	ab
<i>Sorghum arudinaceum</i>	2m	rare
<i>Enicostemma axillare</i>	1m	com
<i>Asystasia gangetica</i>	prostrate	com
<i>Launaea cornuta</i>	1m	com
<i>Ampelocissus africana</i>	1m	occ
<i>Caperonia fistulosa</i>	0 6m	occ

SITE NUMBER 15

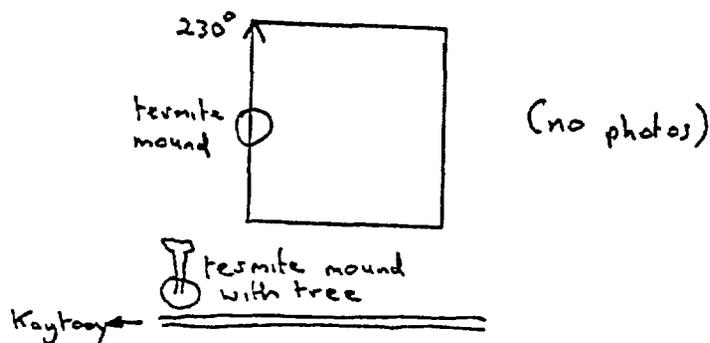
Location: 7km from Fanoole Barrage on 335°.

0°12'N, 42°42'E

Established 7 August 1986

Directions. Travel along west flood bund upstream of Fanoole barrage for 7.6km, turn left into Kaytooy village. From landward edge of village 0.7, fork right, 1.6 fork right, 2.2 end of cultivations, 3.2 large Acacia with termite mound at base. Site was near here

Layout 20 x 20



Markers for relocation: Cleared for cultivation during JESS

Description

Forested *dhesheeg*. Flooding now (mostly?) prevented by Fanoole bunds. Area exploited for timber, but only destroyed when cleared for cultivation. Much termite activity with many mounds

Soil Deep, surface covered with litter over humus, no ped formation. Not sticky or plastic. Humic forest loam. Color (slightly damp). 5YR 2/2

Plant Species On and Around Site

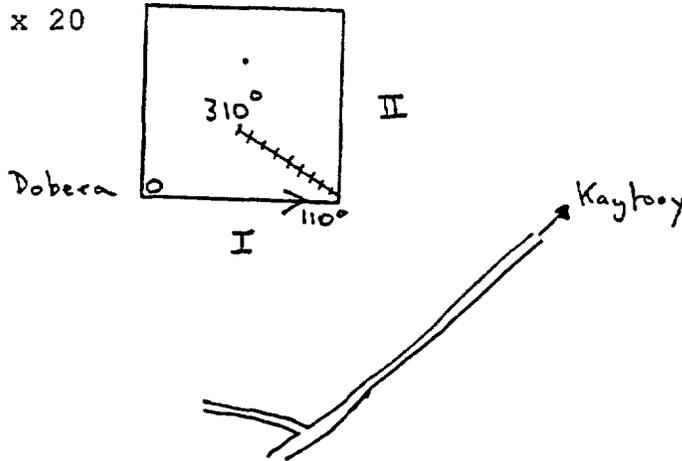
<i>Acacia royumae</i>	30m	occ
<i>A elatior</i>	30m	occ
<i>Lecaniodiscus fraxinifolius</i>	15m	com
<i>Cola sp. nov*</i>	16m	occ
<i>Acalypha fruticosa</i>	3m	ab
<i>Rinorea elliptica</i>	5m	ab
<i>Cordia goetzei</i>	20m	occ
<i>Lepisanthes senegalensis</i>	18m	occ
<i>Olea capensis</i>	3m	occ
<i>Thespesia danis</i>	8m	occ
<i>Combretum illiarii?</i>	12m	ab

SITE NUMBER 16

Location 6.5 km from Fanoole barrage on 350°
00°48'N, 42°38'E
Established 7 August 1986

Directions See site 15 for Kaytooy village From inland edge of village travel 1.4km along track towards site 15 Site 16 is on right side of track

Layout 20 x 20



Marks for relocation. Small track bears right from main track, from this junction site is 25.4m on 10°

Description

Flat area of floodplain with many holes approaching 1m in diameter and depth
Now rarely floods due to Fanoole bunds (Probably flooded in gu' 87)
Burns most dry seasons including xagaa 1986 and jillaal 1987 and 1988
Fields gradually spreading in this area.
No grazing, pastoralists do not pass through this area
Soil Deep, surface cracking and dense grass cover No peds, friable to crumbs Slightly sticky, plastic
Clay loam Color (Slightly damp) 7.5YR 3/2

Plant Species On and Around Site

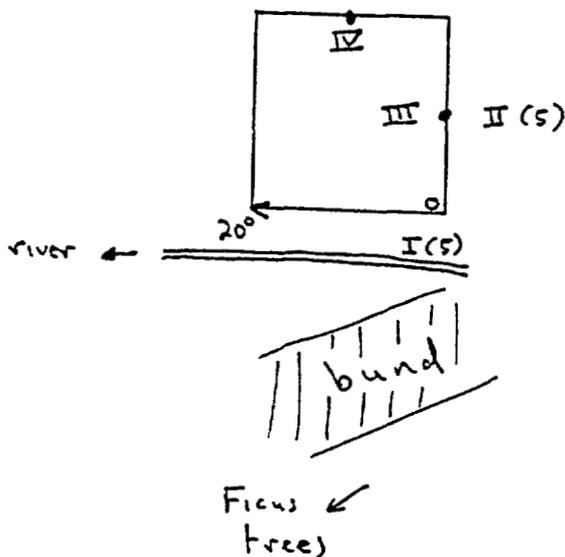
<i>Thespesia danis</i>	1 5m	com
<i>Dobera glabra</i>	10-12m	com
<i>Dichrostachys cinerea</i>	1 5m	occ
<i>Ormocarpum kirkii</i>	1 5m	occ
<i>Salvadora persica</i>	6m	rare
<i>Sporobolus helvolus</i>	0 4m	dom
<i>Rottboellia cochinchinensis</i>	0 4m	rare
<i>Sporobolus</i> sp	1m	com
<i>Cucumis dipsaceus</i>	prostrate	occ
<i>Euphorbia acalyphoides</i>	0 6m	occ
<i>Veronia cinerea</i>	0 5m	com
<i>Corchorus olitorius</i>	1 5m	rare
<i>Ipomoea sepiaria</i>	0 2m	ab
<i>Vigna unguiculata</i>	0 3m	occ
<i>Ipomoea plebeia</i>	prostrate	occ
<i>Enicostemma axillare</i>	0 4m	rare
<i>Indigofera schimperii</i>	0 4m	com

SITE NUMBER 17

Location. 8.8 km from Fanoole barrage on 348°
0°49'N, 42°38'E.
Established 8 August 1986

Directions See site 15 for directions to Kaytooy village
Leave village from N end away from river on track in NW-NNW
direction After 2.4 km reach area called Kaakuurey Guide
may be necessary (Muxamed Gaashaan Nasib from Kaytooy)
General area changed significantly in 1988

Layout 10 x 10



Markers for relocation 92 paces from stand of *Ficus* trees
near bund along cleared trail; then 40 paces over bund and
along forest track leading to river. (Area in flux on last
JESS visit).

Description

Sandy levee at upstream end of barrage bunds
Floods frequently - in 1985 and gu' 87.
Much removal of thin poles and occasional felling of larger
trees, but at an apparently sustainable level
No evidence of livestock activities
Soil: Deep, surface smooth sand under leaf litter No peds,
breaks to sand grains Not sticky or plastic
Fine sand Color (damp). 5YR 4/6

Plants On and Around Site

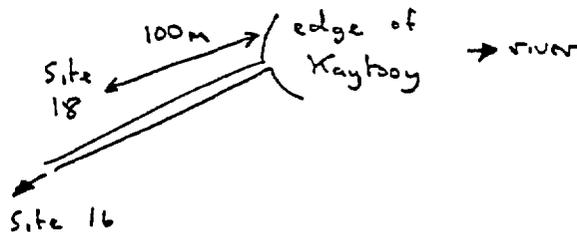
<i>Lecaniodiscus fraxinifolius</i>	9m	occ
<i>Drypetes natalensis</i>	3m	ab
<i>Monanthoptaxis fornicata</i>	3m	occ
<i>Thespesia danis</i>	7m	occ
<i>Combretum illairii?</i>	20m	occ
<i>Acacia elatior</i>	25m	rare
<i>Combretum aculeata</i>	3m	occ
<i>Grewia</i> sp	4m	com
<i>Mimusops fruticosa</i>	5m	rare
<i>Meyna tetraphylla</i>	0 5	rare
<i>Pavetta sphacrobotrys</i>	3m	rare
Five other unidentified woody species		
On river bank <i>Ludwigia</i> sp ? (new to Somalia), a red stemmed forb to 1 5m with yellow flowers		

SITE NUMBER 18

Location 7km from Fanoole barrage on 0°
0°48'N, 42°39'E
Established 8 August 1986

Directions Take track from Kaytooy towards sites 15 and 16
Area to right of track after 100m is site 18.

Layout not defined



Markers for relocation none

Description

Site chosen as uniform stand of dwarf shrub *Cassia tallacina* covering much of area W of Kaytooy. Said to be undesirable plant colonizing abandoned cultivation. This area last cultivated 4-5 years previously before present site of village established. During JESS gradual changes occurred with reduction in *C tallacina* and increase in grasses, particularly *Cenchrus ciliaris* and *Sporobolus* sp. By jillaal 88 all *C tallacina* gone. Some parts of area burned in jillaal 87 and 88. Reduced flooding since Fanoole bunds built.

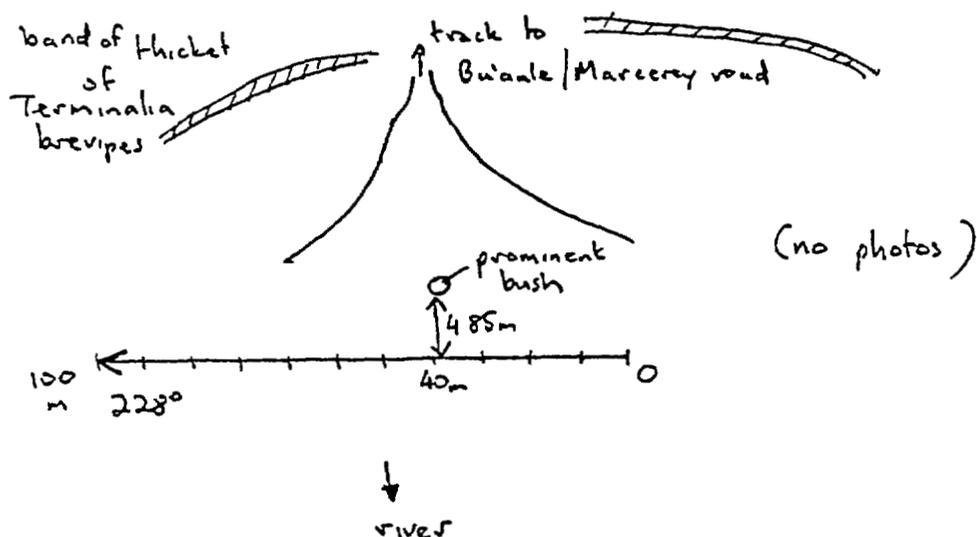
Soil Deep, surface covered with litter. No peds, breaks to sand grains. Not sticky or plastic.
Fine sand. Color (almost dry) 10YR 4/3

SITE NUMBER 19

Location 22.5 km from Fanoole barrage on 335°
0°56'N, 42°35'E.

Directions Can be approached on Bu'aale-Mareerey road from N or S. From N, travel 17.7 km S from Qaadhaale track (see sites 10 & 11), turn left along stock route towards river. From S, travel c 33 km N from Fanoole barrage before turning right towards river. Nearest village on W side of river is Billi Weyn.

Layout 100m line transect across major stock route



Markers for relocation: not marked because flooded in Jan 88 following gu' 87 flood. See layout for relocation

Description

Dhesheeg edge used as important livestock watering point
Site in grass/dwarf shrub zone, but at higher level is a dense band of *Terminalia brevipes* thicket (cf site 41)
Floods frequently and holds water for long periods
Heavy grazing and browsing because used as water point
Tsetse present

Dhesheeg cultivated in part when dry.

Soil. Deep, surface has thin layer of sand with many fragments of snail (*Pila*) shells. Consolidated alluvial sand has no peds or horizons. Not sticky or plastic.
Coarse sand Color (dry) 2.5YR 6/2

Plant Species On and Around Site

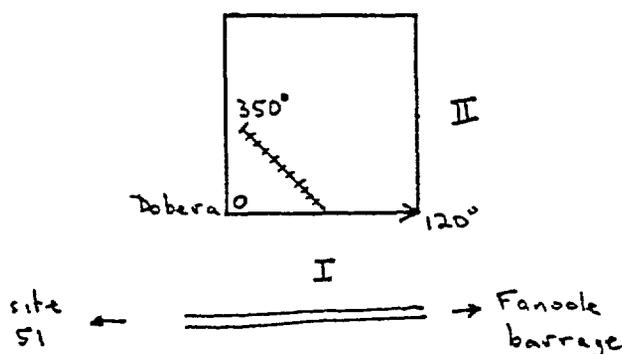
<i>Dactyloctenium aristatum</i>	0 2m	com
<i>Tetrapogon tenellus</i>	0 3m	occ
<i>Cyperus compressus</i>	0 4m	com
<i>Solanum incanum</i>	0 3m	rare
<i>Corchorus trilocularis</i>	0 3m	com
<i>Indigofera microcarpa</i>	0 5m	com

SITE NUMBER 20

Location: 2km from Fanoole barrage on 325°
0°45'N, 42°39'E.
Established 9 August 1986.

Directions On N side of tall grass *dhesheeg* (site 21) on road N to site 19, approximately 5 km along track from Fanoole barrage Also 3km SE of site 51 on left of road

Layout 20 x 20



Markers for relocation Hole on left of road 7m on 43° from site

Description

Transition between *dhesheeg* and levee with hummocky microtopography.

Floods, to c 1m in gu' 87 Burns occasionally (late jillaal 87).

Ungrazed Jan 87, grazed along road side Jan 88 Close to cultivations in *dhesheeg*.

Soil: Deep, surface has loose crumbs and plant litter. Weak sub-angular peds break to crumbs. Non sticky, moderately plastic.

Sandy clay loam Color (damp) 10YR 4/4

Plant Species On and Around Site

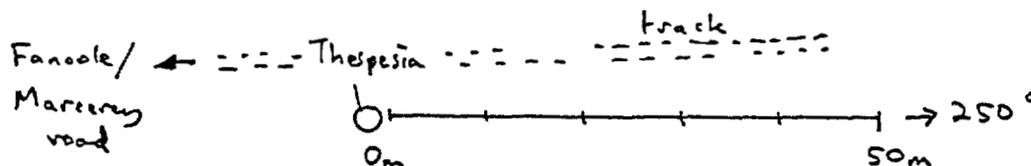
<i>Combretum hereroense</i>	5m	occ
<i>Dobera glabra</i>	7m	occ
<i>Salvadora persica</i>	3m	com
<i>Thespesia danis</i>	3m	com
<i>Acacia nilotica</i>	8m	com
<i>Phyllanthus somalensis</i>	1 5m	com
<i>Sporobolus helvolus</i>	0 5m	com
<i>Sporobolus sp</i>	0 6m	ab
<i>Eriochloa meyerana</i>	2m	com
<i>Urochloa panicoides</i>	0 3m	occ
<i>Aerva lanata</i>	0.4m	com
<i>Veronia cinerea</i>	0 4m	com
<i>Cistanche sp (parasite on S. persica)</i>		rare
<i>Melhania ovata</i>	0 5m	rare
<i>Corchorus olitorius</i>	1 5m	rare
<i>Cassia tallacina</i>	0 6m	com
<i>Rhynchosia minima</i>	0.4m	com
<i>Indigofera schimperi</i>	0 6m	ab

SITE NUMBER 21

Location 1km from Fanoole barrage on 325°
0°45'N, 42°39'E
Established 10 August 1986.

Directions Road from Fanoole barrage (W) for 2.9km, turn
right on c 300° for 0.2km

Layout 50m line transect



Markers for relocation Hole dug beside *Thespesia* bush
marking beginning of transect. Pipes at 0, 3 & 20m

Description

Dhesheeg with long grass on site of abandoned cultivation
Floods frequently including gu' 85 and 87 Burns frequently,
jillaal 87 and 88

Close to cultivation in other parts of *dhesheeg*

No evidence of livestock use.

Soil Deep, surface covered by grass litter Weak sub-
angular peds, breaking to crumbs and dust Non sticky,
plastic

Clay loam. Color (dry) 7 5YR 3/2.

Plant Species On and Around Site

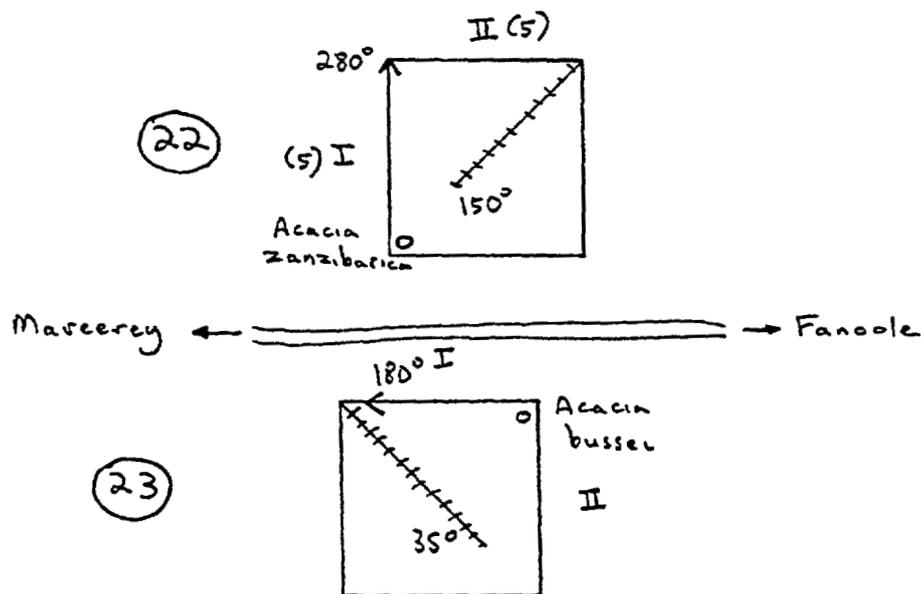
<i>Thespesia danis</i>	2m	rare
<i>Phyllanthus somalensis</i>	1 2m	com
<i>Eriochloa meyerana</i>	2m	dom
<i>Enicostema axillare</i>	0 4m	occ
<i>Clitoria terneata</i>	1 5m	occ
<i>Ipomoea plebeia</i>	1 5m	rare
<i>Rhynchosia mininma</i>	1 5m	occ

SITE NUMBERS 22 & 23

Location 20km from Jilib on 330°
0°39'N, 42°41'E
Established 10 August 1986

Directions 0, W side of Fanoole barrage, road S to Mareerey, 15km site 22 to right and site 23 to left of track (or 2.7km south of abandoned village on left of road, c 12 5km S of barrage)

Layout both 10 x 10



Markers for relocation: Hole on right side of road, 22 is 4 8m on 339°, 23 is 10.6m on 48°.

Description

Marine plain on which site 23 was burning on 6 August 1986 while 22 was not. No further burning took place during JESS. Above floodplain.

Not close to any permanent settlement, but small nomad camp in January 1988.

Little grazing, although clearly used as a route for movement of livestock in dry season.

Soil Deep, surface has loose crumbs and litter. Weak sub-angular blocking easily breaking to crumbs and dust. Slightly sticky, plastic.

Silty clay loam Color (dry) 10YR 3/3

Plant Species On and Around Sites

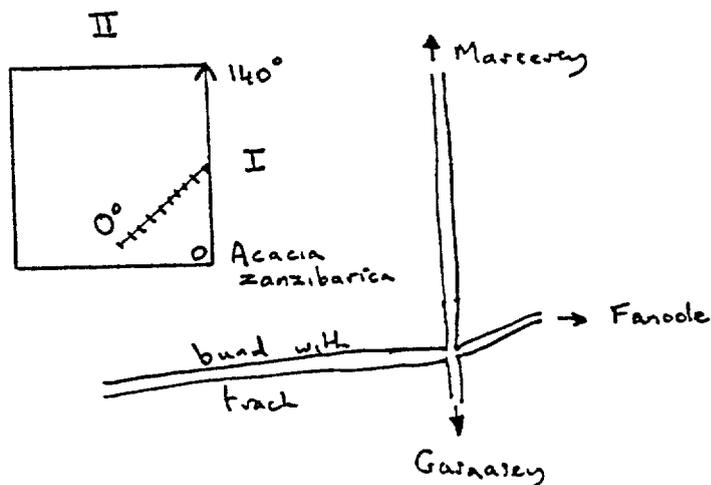
<i>Acacia reficiens</i>	4m	occ
<i>A zanzibarica</i>	6m	ab
<i>A. bussei</i>	5m	occ
<i>A depanolobium</i>	1m	occ
<i>Commiphora africana</i>	2m	com
<i>Maerua crassifolia</i>	3m	rare
<i>Combretum hereroense</i>	2m	com
<i>Thespesia danis</i>	0 2m	rare
<i>Salvadora persica</i>	2m	rare
<i>Jatropha trifida</i>	0 7m	rare
<i>Cephalocroton cordofanus</i>	1 5m	ab
<i>Cenchrus ciliaris</i>	0 6m	ab
<i>Digitaria milianjiana</i>	0 5m	com
<i>Sporobolus helvolus</i>	0 5m	occ
<i>Cyphostemma sp</i>	0 4m	rare
<i>Cadaba sp</i>	1 5m	com

SITE NUMBER 24

Location 14km from Jilib on 315°
0°35'N, 42°41'E
Established 11 August 1986

Directions On road from Fanoole barrage to Mareerey. 0, Little Jubba river W bank opposite Xaraaw village, 0 9 bear right (straight is to Farxan village), 6 6 cross road - straight is flood bund, left Garaasey village, right main track to Mareerey (see "layout")

Layout. 20 x20



Markers for relocation: Hole on left of Mareerey track 75 paces from cross road, site is 4.9m on 118°.

Decription

Flat floodplain, flooded gu' 85 and 87.

Close to Garaasey village and sugar plantation earthworks
Burned jillaal 1986 and 1987.

Moderate to heavy grazing in dry season.

Soil Deep, surface has crumbs and plant litter, some cracking and sink holes. Hard sub-angular peds breaking into crumbs, dust and hard lumps. Very slightly sticky, plastic Clay. Color (slightly moist) 10YR 3/1.

Plant Species On and Around Site

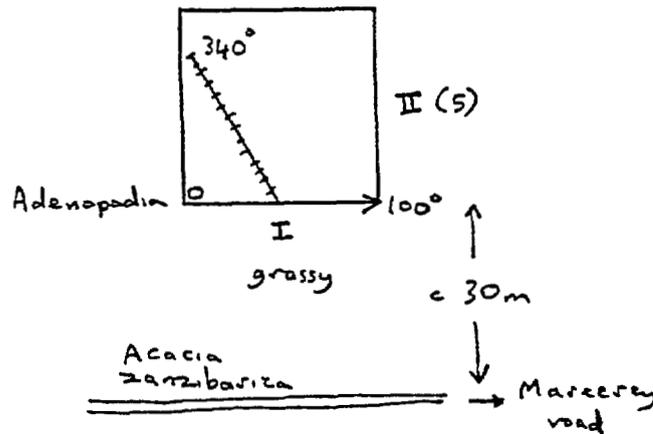
<i>Acacia zanzibarica</i>	5m	rare
<i>A. drepanolobium</i>	3m	com
<i>A. nilotica</i>	7m	rare
<i>Balanites</i> sp	4m	com
<i>Cephalocroton cordofanus</i>	1m	ab
<i>Albizia anthelmintica</i> (young)	0 5m	rare
<i>Phyllanthus somalensis</i>	0 7m	com
<i>Thespesia danis</i>	1 5m	occ
<i>Setaria incrassata</i>	1 8m	dom
<i>Digitaria milianjiana</i>	1m	occ
<i>Erlangea somalensis</i>	0 4m	occ
<i>Rhynchosia minima</i>	0 4m	com
<i>Cassia tallacina</i>	0 6m	occ

SITE NUMBER 25

Location c. 5.5 km N of Mareerey
0°28'N, 42°42'E
Established 12 August 1986

Directions From, 0, cross road S of Mareerey HQ, take east road, 0.8, fork left; 4.6 turn left on small track, 6.9, site on right.

Layout 10 x 10



Markers for relocation: Hole at side of track, 53 paces on 0° to site.

Description

Flat area of floodplain, floods rarely, possibly never due to sugar plantation bunds Burned late jillaal 87.

Close to cultivation which is spreading.

Moderately grazed some years; some browsing; substantial wood cutting.

Soil Deep, surface cover of grass, cracks and sinkholes
Hard sub-angular peds break into crumbs and hard lumps Non sticky, moderately plastic
Clay loam Color (dry) 10YR 3/2

Plant Species On and Around Site

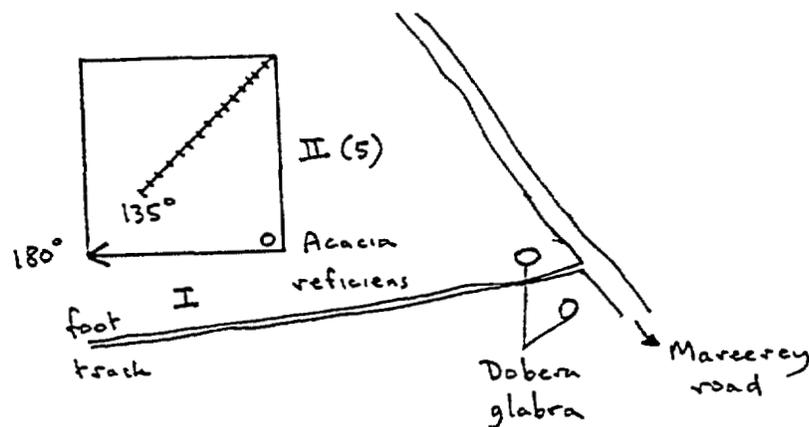
<i>Adenopodia rotundifolia</i>	5m		dom
<i>Acacia zanzibarica</i>	7m		locally dom
<i>A nilotica</i>	5m		occ
<i>Dichrostachys cinerea</i>	1m		occ
<i>Salvadora persica</i>	5m		occ
<i>Jatropha trifida</i>	0 3m		rare
<i>Phyllanthus somalensis</i>	1m		com
<i>Thespesia danis</i>	2m		com
<i>Grewia villosa</i>	0 6m		rare
<i>Flueggea virosa</i>	2m		occ
<i>Hibiscus hildebrandtii</i>	1m		rare
<i>Ormocarpum kirkii</i>	2m		rare
<i>Sporobolus helvolus</i>	0 5m	before fire	dom
<i>Urochloa panicoides</i>	0 3m		com
<i>Panicum infestum</i>	0 4m	after fire	dom
<i>Commelina sp</i>	0 3m		com
<i>Solanum sp</i>	0 6m		com
<i>Ipomoea plebeia</i>	0.5m		occ
<i>Abutilon pannosum</i>	0 5m		occ
<i>Aerva lanata</i>	0 5m		ab
<i>Leucas deflexa</i>	0 6m		occ
<i>Ipomoea sepiaria</i>	0 3m		occ
<i>Tragia plucknetii</i>	0 6m		occ
unidentified crucifer	0 4m		rare
<i>Indigofera sp.</i>	0 4m		

SITE NUMBER 26

Location 3 km W of Mareerey
0°26'N, 42°40'E
Established 12 August 1986

Directions 0, crossroad at sugar HQ (see site 25) take W track which then turns S; 1.7, turn on to small westbound (right) track, 3.7, small track to left marks position of site.

Layout 10 x 10



Markers for relocation Prominent Dobera tree right side of road, 15.6m on 186° to site.

Description

Flat marine plain above floodplain
Not close to human settlement
Slight grazing and browsing, substantial wood cutting
Soil Deep, surface of litter and loose sand grains
Hard, no peds, crumbles to sand Not sticky or plastic
Fine consolidated sand Color (dry). 10YR 5/4.

Plant Species On and Around Site

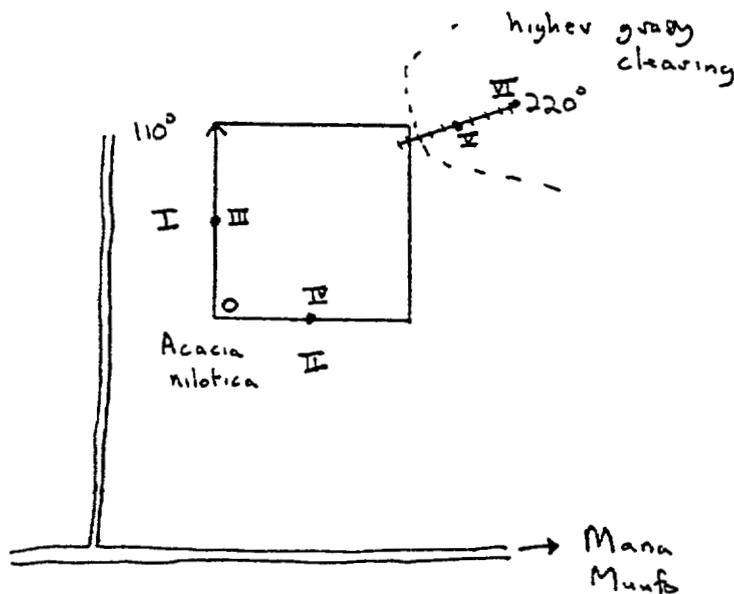
<i>Acacia reficiens</i>	4m	ab
<i>A. mellifera</i>	2 5m	com
<i>A. bussei</i>	2 5m	rare
<i>A. nilotica</i>	2m	occ
<i>A. zanzibarica</i>	2m	rare
<i>Dobera glabra</i>	6m	occ
<i>Grewia tenax</i>	2m	com
<i>G villosa</i>	1 5m	occ
<i>Grewia sp.</i>	0 5m	rare
<i>Anisotes trisulcus</i>	2 5m	com
<i>Cordia sinensis</i>	3 5m	com
<i>Salvadora persica</i>	4m	occ
<i>Thespesia danis</i>	2m	occ
<i>Balanites sp</i>	3m	rare
<i>Cadaba sp</i>	1 7m	occ
<i>Maerua crassifolia</i>	2 5m	occ
<i>Combretum sp.</i>	3 5m	occ
<i>Commiphora sp.</i>	3 5m	rare
<i>Dichrostachys cinerea</i>	1m	occ
<i>Sterculia rhynchocharpa</i>	1m	rare
<i>Sarcostemma viminalis</i>	3 5m	rare
<i>Enteropogon macrostachyus</i>	1m	ab
<i>Dactyloctenium scindicum</i>	0 2m	com
<i>Cenchrus ciliaris</i>	0 2m	rare
<i>Sporobolus sp</i>	0 4m	rare
<i>Cyperus sp</i>	0 2m	com
<i>Sansevieria spp</i>	1m	com
<i>Commelina sp</i>	0 2m	com
<i>Psilotrichum sericeum</i>	0 3m	ab
<i>Pedaliium murex</i>	0.15m	occ
<i>Blepharis persica</i>	0 1m	occ
<i>Seddera bagshawei</i>	0 1m	occ

SITE NUMBER 27

Location· 1.75km from Mana Mufo on 290°.
0°6'N, 42°42'E
Established 13 August 1986

Directions: At Mana Mufo on Jilib to Kismaayo road turn right (W) along track for 1.75km Site lies on foot track to right

Layout· 20 x 20 plus external 10m line transect



Markers for relocation: 162 paces along second track on 260°.

Description

Heterogeneous river alluvia forming hummocky terrain
Floods commonly either from river or rain water.
Not close to settlement, but nearby land has increasing cultivation.
Virtually ungrazed, slightly browsed although livestock pass through regularly to river. Much cutting of wood.
Soil Deep, surface with deep cracks leaf litter and snail shells. Weak angular peds. Slightly sticky, plastic. Clay. Color (damp) 10YR 3/2. (Soil on higher open area of line transect is fine sandy clay; color[dry]: 10YR 4/4)

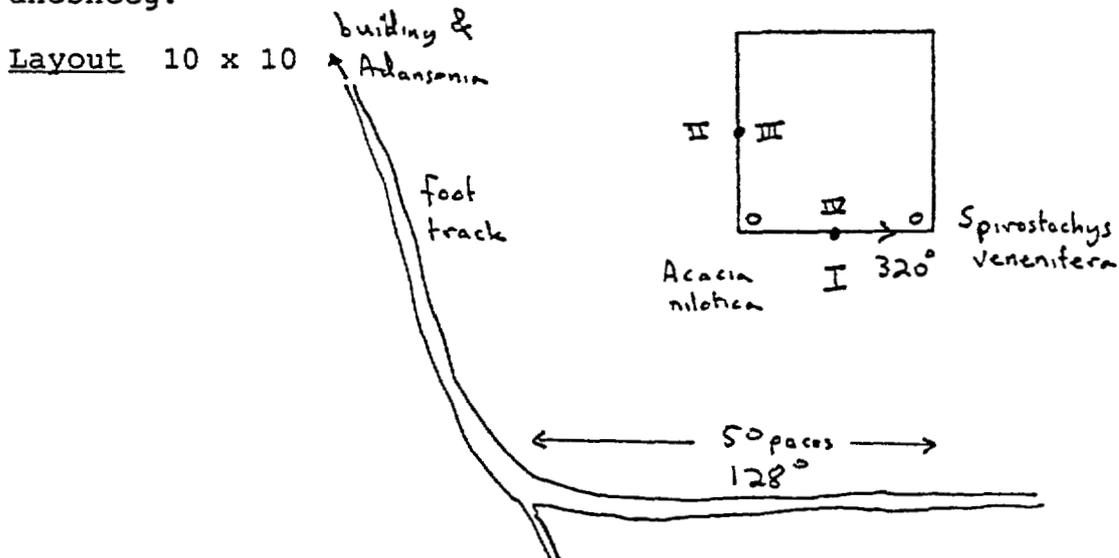
Plant Species On and Around Site

<i>Acacia nilotica</i>	5-6m	dom
<i>Phyllanthus somalensis</i>	1m	ab
<i>Terminalia brevipes</i>	1 5m	occ
<i>Ormocarpum kirkii</i>	1 5m	rare
<i>Sporobolus helvolus</i>	0 8m	ab
<i>Eriochloa meyerana</i>	1m	ab
<i>Commelina</i> sp	0 3	com
<i>Orthosiphon</i> sp ?	0 4m	com
<i>Caperonia fistulosa</i>	0 3m	com
<i>Achyranthes aspersa</i>	0 3m	occ
2-3 unidentified forbs		

SITE NUMBER 28

Location 4km from Jamaame on 328°
0°6'N, 42°43'E
Established 14 August 1986

Directions. 0, Jamaame petrol station, 0.8 turn left [site 29 is to right of this track at 1.0], 2.7 turn left, 3.9 turn right, 4.3/4 stop by large *Adansonia* and collapsed building. Foot track to site moves around right side of *dhesheeg*.



Markers for relocation: After 350-400 paces track turns left with minor trail going straight. Follow main track for further 50 paces on 128°, turn left into vegetation (large *Spirostachys*) for 11 paces to site.

Description

Dhesheeg floods frequently including gu' 87.
Cultivation in some other parts of *dhesheeg*
Livestock use the area seasonally, but site shows no sign of browsing. Substantial wood cutting.
Soil Deep, surface has fine sand grains and plant litter.
Hard sub-angular peds breaking to grains and crumbs.
Slightly sticky, moderately plastic.
Fine sandy clay loam Color (almost dry): 10YR 2/2

Plant Species On and Around Site

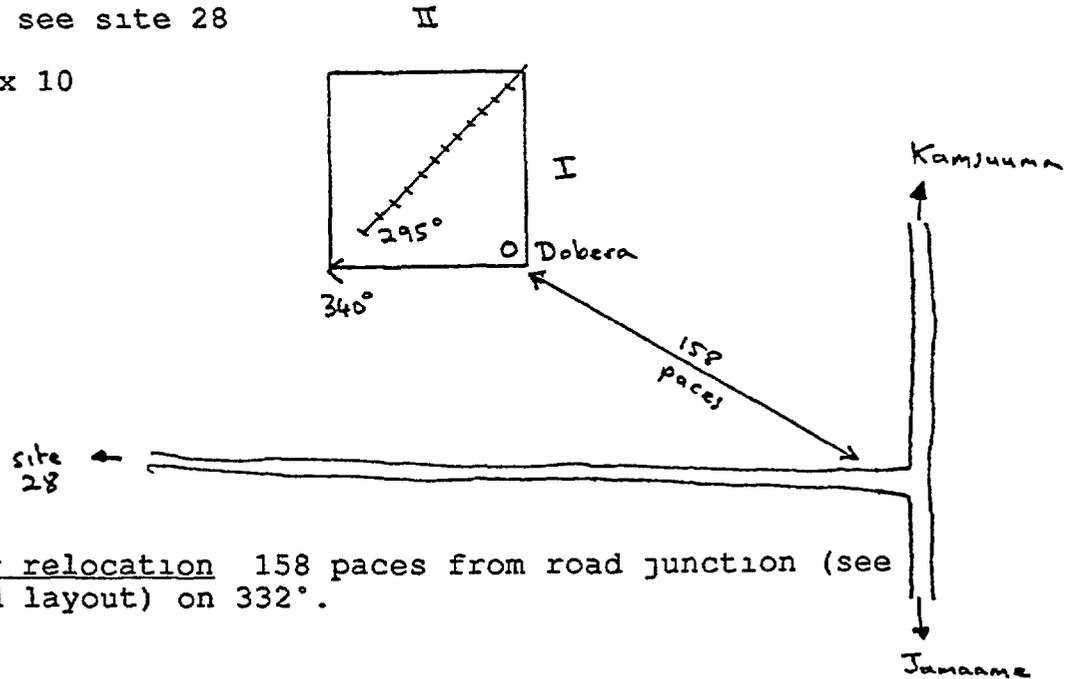
<i>Spirostachys venenifera</i>	12m	rare
<i>Acacia nilotica</i>	7m	com
<i>A. eliator</i>	9m	rare
<i>Garcinia livinstonei</i>	5m	rare
<i>Thespesia danis</i>	4 5m	com
<i>Cordia sinensis</i>	5m	com
<i>Flueggea virosa</i>	4m	com
<i>Phyllanthus somalensis</i>	1 5m	ab
<i>Combretum constrictum</i>	5m	comm
<i>Hyphaene</i> sp (seedlings)	0 5m	com
<i>Terminalia brevipes</i>	5m	occ
<i>Ziziphus mucronata</i>	4m	rare
<i>Aerva lanata</i>	0 15m	com

SITE NUMBER 29

Location: 1 km N of Jamaame
0°5'N, 42°45'E
Established 14 August 1988

Directions see site 28

Layout. 10 x 10



Markers for relocation 158 paces from road junction (see site 28 and layout) on 332°.

Description

Gently sloping area above floodplain Cultivated in late 60s. All plants stunted due to dryness and heavy grazing and browsing

Soil: Deep; surface litter and crumbs. No peds, breaks to crumbs, dust and coarse gritty particles. Non sticky, slightly plastic.

Gritty sandy loam/sandy clay loam Color (dry) 10YR 3/2

Plant Species On and Around Site

<i>Dobera glabra</i>	3 5m	rare
<i>Acacia nilotica</i>	0 7m	ab
<i>A tortilis</i>	0 5m	ab
<i>Thespesia danis</i>	0 4m	com
<i>Grewia villosa</i>	0 3m	occ
<i>Leptotherium senegalense</i>	0 15m	occ
<i>Eragrostis ciliaris</i>	0 25m	com
<i>Enteropogon sp ?</i>	0 3m	com
<i>Cenchrus ciliaris</i>	0 2m	rare
<i>Tragia plucknetii</i>	0 3m	rare
<i>Senra incana</i>	0 7m	ab
<i>Trachyspermum aethusifolium</i>	0 3m	com
<i>Solanum spp</i>	0 4m	ab
<i>Blepharis persica</i>	0 15m	ab
<i>Abutilon pannosum</i>	0 3m	com
<i>Tribulus terrestris</i>	prostrate	occ
<i>Seddera bagshawei</i>	prostrate	occ
<i>Oncocalyx kelleri</i>	parasite on <i>Dobera</i>	rare

SITE NUMBER 30

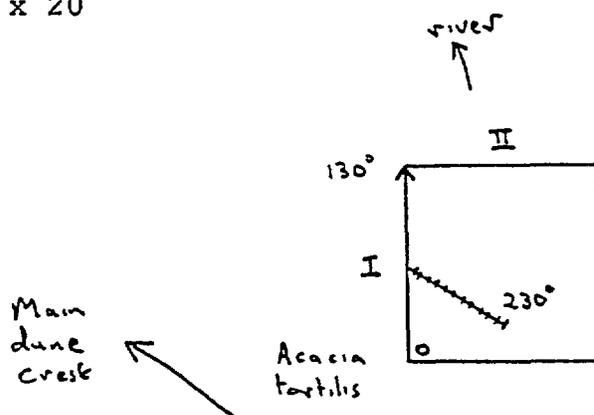
Location 0.5 km E of Goob Weyn

0°15'S, 42°36'E

Established 15 August 1986

Directions Drive through Goob Weyn to river where boats kept and water collected. Climb up high dune and follow most obvious path.

Layout 20 x 20



Marks for relocation paths change due to soft sand. Site about 50 paces from dune crest which overlooks river.

Description

~Fixed dunes, moderate slope

Grazed and browsed and some wood cutting

Soil Fine/medium sand Color(dry) 10YR 6/3.

Plant Species On and Around Site

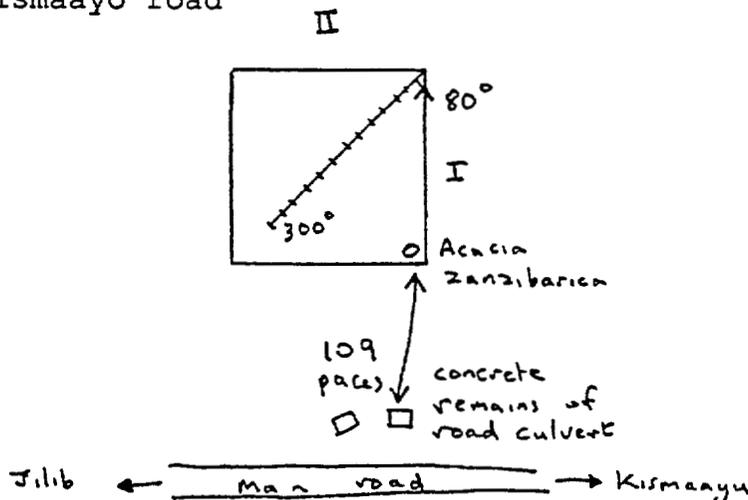
<i>Acacia tortilis</i>	4m	dom (tree)
<i>A. senegal</i>	2m	com
<i>Cordia somaliensis</i>	4m	dom (shrub)
<i>Grewia</i> sp	1.5m	occ
<i>G villosa</i>	1m	occ
<i>Balanites</i> sp.	4m	com
<i>Uvaria</i> sp	2m	occ
<i>Azima tetracantha</i>	3m	occ
<i>Euphorbia scheffleri</i>	2 5m	occ
<i>Leptotherium senegalense</i>	0 15m	com
<i>Dactyloctenium scindicum</i>	0 15m	com
<i>Eragrostis ciliaris</i>	0 15m	com
<i>Urochloa rudis</i>	0 1m	com
<i>Dignathia hirtella</i>	0 2m	occ
<i>Commelina</i> sp	0 1m	occ
<i>Adenium globosum</i>	0 8m	rare
<i>Blepharis persica</i>	0 1m	ab
<i>Psiltotrichum sericeum</i>	0 3m	ab
<i>Endostemon gracilis</i>	0 15m	com
<i>Spermacoce filituba</i>	0 15m	dom (forb)
<i>Merremia</i> sp	prostrate	occ
<i>Asystasia</i> sp ??	0 25m	rare
<i>Solanum</i> sp.	0 5m	ab
<i>Achyranthes aspersa</i>	0 3m	occ
<i>Ipomoea garkeana</i>	0 2m	com
<i>Heliotropium</i> sp	0 1m	rare
<i>Tribulus terrestris</i>	prostrate	occ

SITE NUMBER 31

Location. 6.9 km from Goob Weyn on Jilib road.
0°11'S, 42°35'E
Established 15 August 1986

Directions. 6.9 km N of Goob Weyn or 30.0 km S of Equator sign to E of Jilib - Kismaayo road

Layout 10 x 10



Markers for relocation. Old culvert remains lie below raised road. From these site is 109 paces on 84°

Description

Flat floodplain was banana plantation 20 years ago. Does not flood from river (probably due to bunding) but may have standing rain water

Heavily grazed in jillaal.

Soil Deep, surface of crumbs with some cracks and sink holes. Hard angular peds. Moderately sticky, plastic. Clay loam/clay. Color (dry) 10YR 3/1.

Plant Species On and Around Site

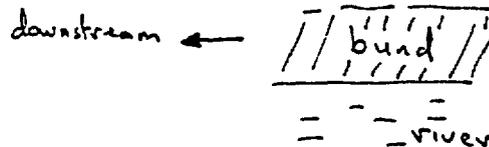
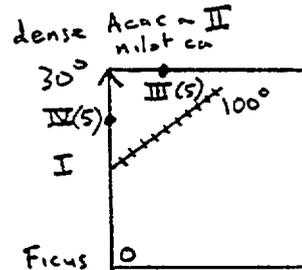
<i>Acacia zanzibarica</i>	0.7m	com
<i>A. nilotica</i>	2m	occ
<i>Cordia sinensis</i>	1m	occ
<i>Grewia tenax</i>	0.5m	occ
<i>Sporobolus helvolus</i>	0.3m	dom 1986
<i>Paspalidium desertorum</i>	0.3m	dom 1987
<i>Commelina</i> sp.	prostrate	occ
<i>Cressa cretica</i>	0.15m	occ
unidentified curcubit	0.1m	rare
<i>Polygala senensis</i>	prostrate	rare

SITE NUMBER 32

Location: 24.5 km from Goob Weyn on 2°
0'2'S, 42°36'E
Established 16 August 1986

Directions 0, Mogambo project housing estate heading S, 31 3, Wiir Koy village take track to left (E), continue to T, take right arm, walk upstream along flood bund to grove of large *Ficus* with open understory

Layout 20 x 20



Markers for relocation: 48 paces into forest from bund

Description

Levee subjected to frequent flooding. Much of area was banana plantation, but now abandoned. Several groves of undisturbed *Ficus* remain

Livestock unimportant at site, little wood cutting.

Soil: Deep, surface cracked and covered with litter. Hard angular peds do not break easily. Moderately sticky, plastic

Clay. Color (slightly damp): 5YR 3/2

Plant Species On and Around Site

<i>Ficus sycomorus</i>	25m	dom
<i>Acacia nilotica</i>	10m	sub-dom
<i>Bridelia cathartica</i>	8m (climber)	ab
<i>Flueggea virosa</i>	3m	ab
<i>Spirostachys venenifera</i>	2m	rare
<i>Thespesia danis</i>	3m	occ
<i>Albizia anthelmintica</i>	0 4m	rare
<i>Garcinia livingstonei</i>	0 3m	rare
<i>Sporobolus helvolus</i>	1m	occ
<i>Tragia plucknetii</i>	0 3m	com
<i>Commelina sp</i>	prostrate	com

SITE NUMBER 33

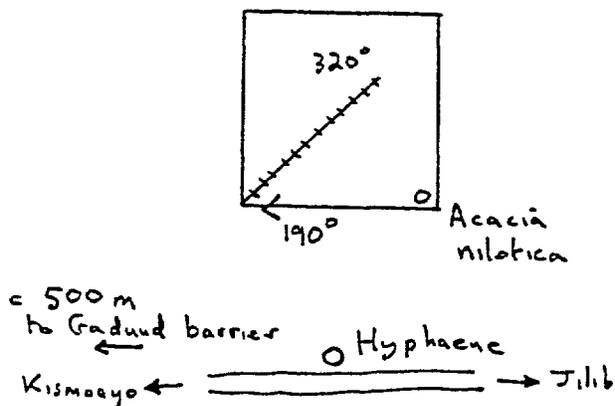
Location: 500m N of Gaduud on main road.

0°4'S, 42°34'E

Established 16 August 1986

Directions 0, Mogambo project housing estate, 37 1, tall *Hyphaene* at side of road on right [c 500m N of Gaduud police barrier]

Layout: 10 x 10



Markers for relocation: 33 2m from roadside *Hyphaene* on 288° to site.

Description

Old levee, no longer close to the river and never flooding. Areas close by cleared during JESS Said not to have flooded for >6 years, but ponds with rain water. Did not flood 87. Some grazing browsing and wood cutting

Soil: Deep, surface of fine sand and grass litter. Sub-angular peds break to fine sand Not sticky or plastic Fine sand. Color (dry): 10YR 3/3

Plant Species On and Around Site

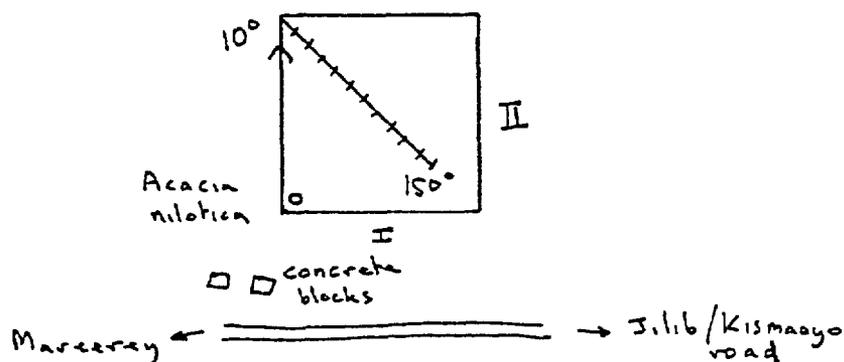
<i>Hyphaene</i> sp	20m	rare
" " seedlings	0 6m	com
<i>Acacia zanzibarica</i>	10m	com
<i>A. nilotica</i>	4m	com
<i>Thespesia danis</i>	2m	ab
<i>Dichrostachys cinerea</i>	1 5m	occ
<i>Lawsonia inermis</i>	2m	rare
<i>Cordia sinensis</i>	2 5m	com
<i>Grewia villosa</i>	3m	occ
<i>Newtonia erlangeri</i>	12m	rare
<i>Phyllanthus somalensis</i>	2m	occ
<i>Dactyloctenium geminatum</i>	0.6m	com
<i>Sporobolus agrostoides</i>	0 6m	com
<i>Enteropogon</i> sp ?	1m	com
<i>Sporobolus helvolus</i>	0 6m	occ
<i>Cenchrus ciliaris</i>	0 6m	occ
<i>Urochloa trichopus</i>	0 25m	com
<i>U. rudis</i>	0 15m	com
<i>Commelina</i> sp	0 15m	com
<i>Pupalia lappacea</i>	0 4m	ab
<i>Gomphocarpus</i> sp	0 6m	rare
<i>Indigofera</i> sp	0.1m	occ

SITE NUMBER 34

Location 9km from Kamsuuma on 230°
0°12'N, 42°43'E
Established 17 August 1986

Directions: 0, start of Jubba Sugar road on Jilib-Kismaayo road, head N, 3 5, site on right [Or c 4km from site 35 if heading S from Jubba Sugar.

Layout 10 x 10



Markers for relocation: broken concrete blocks by roadside,
7 4m on 338° to site

Description

Heterogeneous riverine alluvium with hummocky micro-topography

Flooded gu' 1987.

Not close to settlement

Grazed in jillaal No burning observed or reported.

Soil Deep, surface hidden by grass and litter, cracking.

Very hard sub-angular peds Moderately sticky, plastic
Clay loam/clay Color (dry) 10YR 3/2

Plant Species On and Around Site

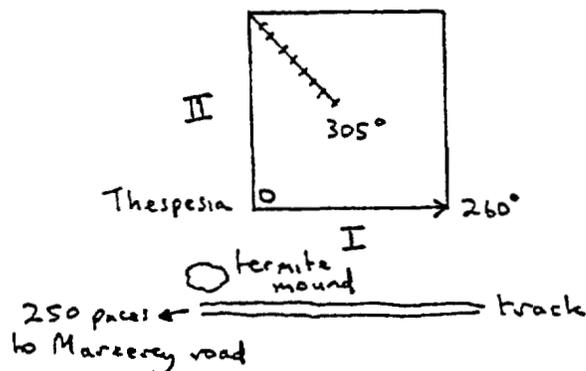
<i>Acacia nilotica</i>	4 5m		occ
<i>Salvadora persica</i>	4m		occ
<i>Combretum sp.</i>	1m		com
<i>Sorghum arudinaceum</i>	1 2m	locally ab	
<i>Sporobolus helvolus</i>	0 5m		com
<i>Cyperus sp</i>	0 5m		com
<i>Leucas deflexa</i>	0 6m		occ
<i>Enicostema axillare</i>	0 3m		com
<i>Sida alba</i>	0 7m		com
<i>Tephrosia pentaphylla</i>	0 7m		com
<i>Indigofera aspersa</i>	0.4m		occ

SITE NUMBER 35

Location. 9.5km from Kamsuuma on 240°
0°12'N, 42°42'E
Established 17 August 1986.

Directions 7.3km N on Jubba Sugar road (see site 34), small track to left, site on left after 250 paces

Layout: 20 x 20



Markers for relocation 28m on 230° from roadside termite mound to site

Description

Marine plain above floodplain, but uneven surface leads to local ponding of rain water.
Burns occasionally, e.g. Oct 86.
Not close to settlement, but road quarry nearby
Moderate grazing in jillaal, some wood cutting
Soil Deep, surface hard and smooth with quartz grains Hard angular peds, consolidated breaking to sand Non sticky, slightly plastic.
Fine loamy sand. Color (dry): 10YR 4/4.

Plant Species On and Around Site

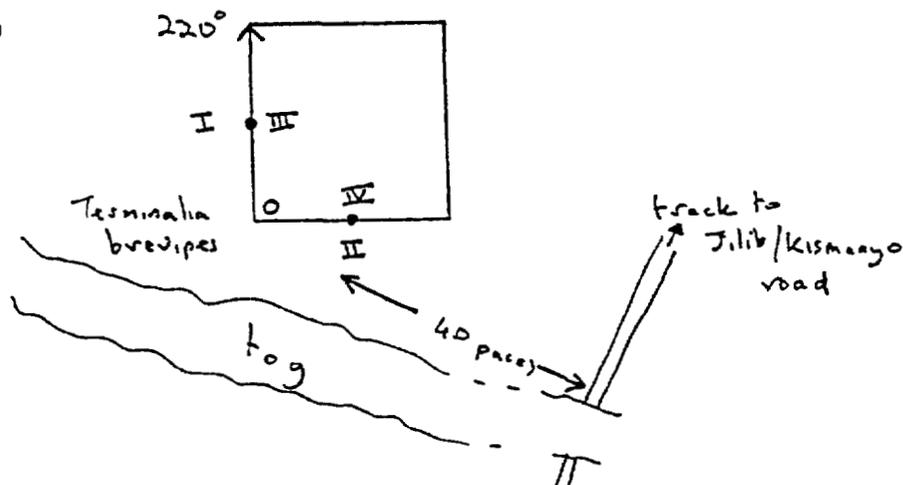
<i>Acacia drepanolobium</i>	2 5m		occ
<i>A zanzibarica</i>	4m		com
<i>Adansonia digitata</i>	10m		rare
<i>Grewia villosa</i>	2m		occ
<i>Cyathula sp</i>	1 5m		occ
<i>Clerodendrum hildebrandtii</i>	3 5m		com
<i>Cordia sinensis</i>	4m		occ
<i>Commiphora sp</i>	3.5m		occ
<i>Phyllanthus somalensis</i>	2m		com
<i>Thespesia danis</i>	5m		occ
<i>Tarenna graveolens</i>	3m		rare
<i>Lawsonia inermis</i>	6m		occ
<i>Cissus sp</i>	3m (creeper)		rare
<i>Boscia coriacea</i>	5m		rare
<i>Salvadora persica</i>	1 7m		occ
<i>Sterculia sp</i>	3m		rare
<i>Dobera glabra</i>	3 5m		rare
<i>Dichrostachys cinerea</i>	3m		occ
<i>Jatropha trifida</i>	0 7m		rare
<i>Sporobolus helvolus</i>	0 5m	before fire	ab
<i>Enteropogon sp?</i>	0.6m		com
<i>Cymbopogon caesius</i>	0 5m		com
<i>Aristida adscencionis</i>	0.3m		com
<i>Urochloa rudis</i>	0 25m	after fire	ab
<i>Paspalidium desertorum</i>	0.4m		ab
<i>Crotalaria pycnostachya</i>	0.4m		occ
<i>Cycnium tubulosum</i>	0 4m		occ
Capparid bush	0 8m		rare
<i>Cadaba sp</i>	0 4m		occ
<i>Indigofera schimperii</i>	0 6m		occ
<i>Indigofera spp. (2)</i>	0 25m		com

SITE NUMBER 36

Location 7km from Kamsuuma on 240°
0°18'N, 42°49'E
Established 18 August 1986

Directions. 0, beginning of tarmac road in Jilib town towards Kamsuuma, 22 6, track to left (E), 23 5 track descends to water course, walk 40 paces right (S) along water course. [Approaching from Kamsuuma bridge, track is at 6.7km N]

Layout 10 x 10



Markers for relocation From intersection of track and stream bed measure 31.3m on 160°, then 5.1m on 240° to site

Description

Seasonal stream side slope; bed ~ flat, said to flow N when Shabeele floods and S when Jubba floods Flooded in gu' 87 Little livestock use, but much wood cutting in some parts Soil: Deep, surface scattered with mollusc and fish remains, leaf litter and a thin layer of soil crumbs. Hard angular peds, difficult to break Sticky and plastic Clay. Color (almost dry). 10YR 3/1

Plant Species On and Around Site

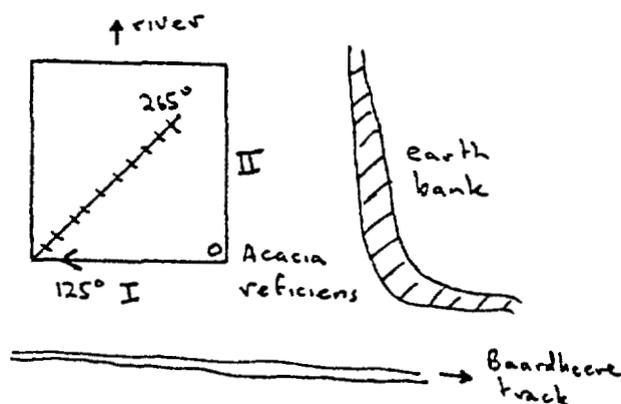
<i>Terminalia brevipes</i>	5m	dom
<i>Phyllanthus somalensis</i>	3m	com
<i>Spirostachys venenifera</i>	10m	com
<i>Thespesia danis</i>	5m	com
<i>Commiphora</i> sp	3 5m	rare
<i>Dobera glabra</i>	5m	occ
<i>Cordia sinensis</i>	5m	occ
<i>Grewia tenax</i>	3m	occ
<i>G villosa</i>	4m	occ
<i>Acacia nilotica</i>	5m	occ
<i>Lawsonia inermis</i>	5m	occ
<i>Eriatherum dregei</i> parasite on <i>T brevipes</i>		rare
<i>Tapinanthus zanzibaricus</i> " " <i>P somalensis</i>		rare
<i>Eriochloa meyerana</i>	2m	com

SITE NUMBER 37

Location: 12km from Baardheere on 275°
2°21'N, 42°E
Established 31 December 1986

Directions 0, site 1, continue westward, 2.8 take track to left (S/SW), 3.6 reach earth bank with cultivations beyond, turn left following bank for c 0.5km to site

Layout 10 x 10



Markers for relocation: corner of earth bank where changes from parallel to river to towards river, 20.3m on 90°.

Description

Flat upper edge of floodplain cultivated c 10 years ago
Flooded in 77 and 87, but not between.
Substantial grazing and browsing seasonally and much wood cutting
Soil Deep river alluvium; surface has fragile crust, small cracks and much termite activity. Soft, weak subangular peds.
Slightly sticky, slightly plastic Color (damp): 7.5YR 5/6.

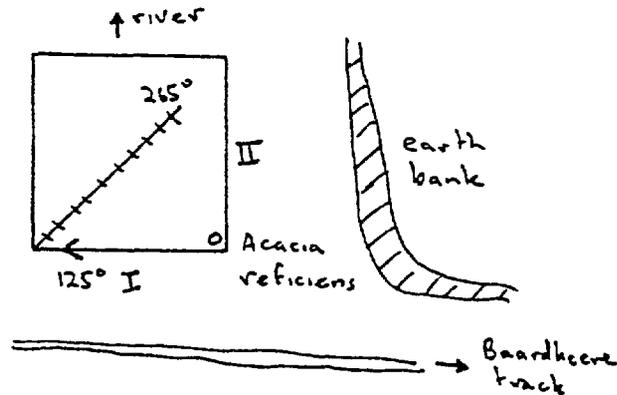
SITE NUMBER 37

Location: 12km from Baardheere on 275°
2°21'N, 42°E

Established 31 December 1986.

Directions 0, site 1, continue westward, 2 8 take track to left (S/SW), 3 6 reach earth bank with cultivations beyond, turn left following bank for c 0 5km to site

Layout 10 x 10



Markers for relocation: corner of earth bank where changes from parallel to river to towards river, 20 3m on 90°

Description

Flat upper edge of floodplain cultivated c 10 years ago
Flooded in 77 and 87, but not between.

Substantial grazing and browsing seasonally and much wood cutting.

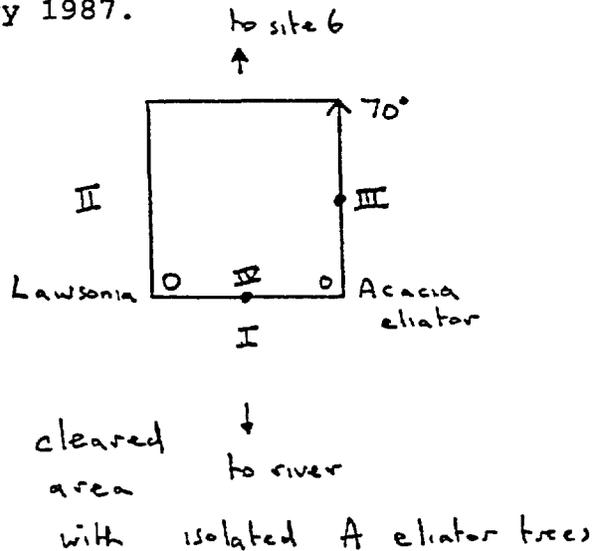
Soil Deep river alluvium, surface has fragile crust, small cracks and much termite activity Soft, weak subangular peds.

Slightly sticky, slightly plastic. Color (damp) 7 5YR 5/6

SITE NUMBER 39

Location & Directions: see site 6
Established 3 January 1987.

Layout 10 x 10



Markers for relocation. same dhesheeg as site 6 but in forested area closer to river, c 200m along devious track
Much of area cleared leaving Acacia eliator trees, site just landward of this cleared area

Description

Dhesheeg, about 200m from river Surrounding area largely cleared leaving 30m Acacia eliator, but not cultivated. Forested site and surroundings have much evidence of wood cutting Trees on site mostly have coppice structure
Floods, including 87

Soil: Deep, somewhat undulating surface has 90% cover of leaf and wood litter with exposed surface covered with soil crumbs. Soft soil with weak angular peds Sticky, moderately plastic.

Silty clay loam Color (moist): 7 5YR 3/2.

Plant Species On and Around Site

<i>Acacia elatior</i>	30m	com
<i>Lecaniodiscus fraxinifolius</i>	7m	com
<i>Thespesia danis</i>	8m	com
<i>Lawsonia inermis</i>	7m	rare
<i>Landolphia</i> sp (liane)	10m	rare

SITE NUMBER 40

Location. 4km from Bu'aale on 30°
1°17'N, 42°35'E
Established 17 January 1987.

Directions 0, Bu'aale Police Station; 0 8, bear left (N),
3 5 Radiile dhesheeg on left, take track to right (c 120°),
3 7 at site.

Layout 4 x 100 belt transect across stock route

Markers for relocation: exact position of site never
relocated, replaced by site 50 in same area.

Description

Above floodplain of Radiile dhesheeg which is a major
livestock watering point. Ministry of Livestock, Forestry
and Range has buildings at dhesheeg
Intensely browsed and grazed, particularly in jillaal,
substantial wood cutting. Area crossed by many livestock
trails

Soil see site 50

Plant Species On and Around Site

<i>Acacia reficiens</i>	2 3m	ab
<i>A nubica</i>	4m	com
<i>A. bussei</i>	2m	occ
<i>A. nilotica</i>	2m	rare
<i>Anisotes trisulcus</i>	2m	occ
<i>Dobera glabra</i>	7m	occ
<i>Grewia tenax</i>	1m	occ

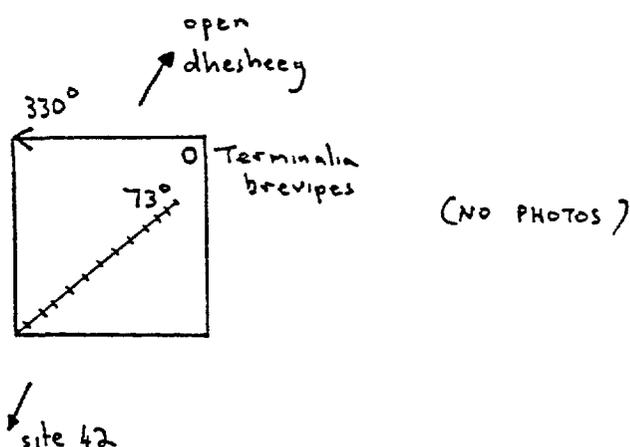
for herbaceous plants see site 50.

SITE NUMBER 41

Location: 9.7km from Bu'aale on 305°
1°18'N, 42°30'E
Established 18 January 1987.

Directions 0, W end of Bu'aale bridge head W, 8 4, cross roads with N/S road, turn right (N), 8.9 bear left (c N) on track, 16 0 reach dhesheeg Gunaafi and site.

Layout· 10 x 10



Markers for relocation· no fixed markers because of flooding, between site 42 and open area of dhesheeg

Description

Thicket around rim of dhesheeg Bed of dhesheeg has band of sedges and *Sporobolus helvolus* with *Solanum* dwarf shrubs at lower levels (see layout).

Floods frequently including 87

Some wood cutting, but many trees fallen due to roots undermined ? by flooding

Soil Deep, surface has partial crust of termite activity, mollusc shells, soil crumbs and cracks Soft subangular peds. Sticky and very plastic.

Clay. Color surface (dry), 10YR 3/3
below (moist), 10YR 4/3.

Plant Species On and Arouns Site

<i>Terminalia brevipes</i>	5m	dom
<i>Phyllanthus somalensis</i>	2 5m	ab
<i>Spirostachys venenifera</i>	4m	rare
unidentified shrub/climber	2m	occ
<i>Eriochloa meyerana</i>	1 5m	occ
<i>Sporobolus helvolus</i>	0 4m	occ
<i>Indigofera</i> sp	?	occ
<i>Solanum</i> sp.	?	occ

SITE NUMBER 42

Location & Directions: see site 41

Layout 10 x 10

Markers for relocation: where track to Gunaafi meets track to left (W) just above thicket zone, 55.7m on 290°.

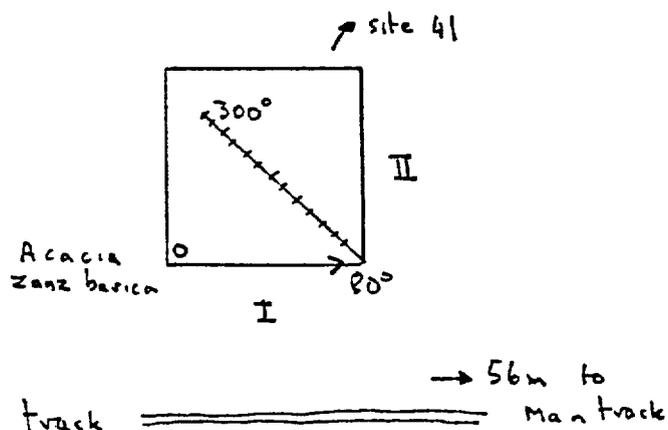
Description

Adjacent to site 41, but upslope in area that floods only slightly and water does not remain standing. Lower edge of site gets more water than upper

Seasonally grazed and browsed, much wood cutting

Soil Deep, surface has large and small cracks, some small stones and fragile, flaky crust with evidence of termite activity Soft, breaking to crumbs, no peds Sticky and moderately plastic

Clay Color surface (dry), 2 5YR, 5/2
below (moist), 7 5YR, 4/2.



Plant Species On and Around Site

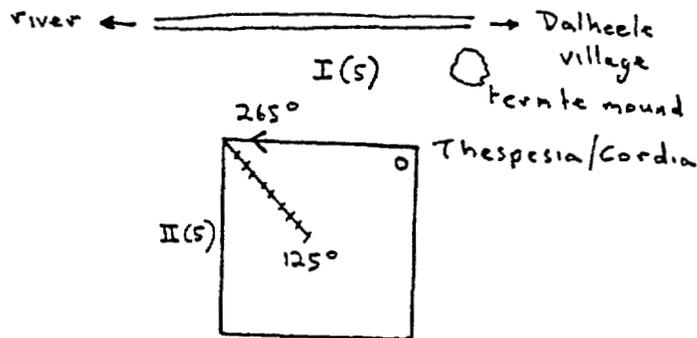
<i>Acacia zanzibarica</i>	5m	ab
<i>Acacia reficiens</i>	0 6m	rare
<i>Phyllanthus somalensis</i>	2m	ab
<i>Terminalia brevipes</i>	2m	com
<i>Thespesia danis</i>	2m	occ
<i>Sporobolus helvolus</i>	1 5m	com
<i>Dacyloctenium scindicum</i>	0 3m	com

SITE NUMBER 43

Location: 6km from Bu'aale on 305°
1°23'N, 42°23'E
Established 19 January 1987

Directions 0, Bu'aale market, take road N (towards Saakow),
5 2, take track on left (W) towards river, 5 8 pass village
of Dalhele, 7 1, site on left (N) of road (0 4km E of
river)

Layout. 20 x 20



Markers for relocation large termite mound by roadside, 23m
on 240° to site

Description

Upper edge of floodplain only flooding when heavy rain and
big flood coincide Probably flooded 87 Area not farmed in
memory and last burned in late 70s
Grazed and browsed in jillaal.

Soil Deep, surface has much grass litter, many termite
mounds and no crust. Hard to penetrate, angular peds break
to crumbs. Not sticky or plastic
Consolidated sandy loam Color (dry) 7 5YR 5/6.

Plant Species On and Around Site

<i>Coffea rhamnifolia</i>	2 5m	ab
<i>Dichrostachys cinerea</i>	1 5m	ab
<i>Cordia sinensis</i>	5m	com
<i>Thespesia danis</i>	7m	com
<i>Acacia nilotica</i>	2m	occ
<i>Acalypha fruticosa</i>	1m	occ
<i>Commiphora</i> sp	5m	occ
<i>Hyphaene</i> sp (seedling)	1m	occ
unidentified shrub	2m	occ
unidentified shrub	1 3m	rare
<i>Cenchrus ciliaris</i>	0 3m	ab
<i>Sporobolus helvolus</i>	0 5m	dom
<i>Veronia hildebrandtii</i>	0 2m	occ
unidentified forb	0 2m	com
<i>Tephrosia uniflora</i>	0 7m	com

SITE NUMBER 44

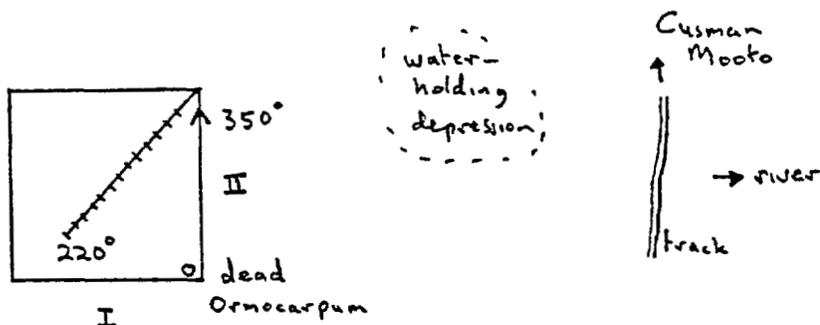
Location. 8km from Fanoole barrage on 147°

0°41'N, 42°42'E

Established 22 January 1987.

Directions 0, W end Fanoole barrage, take Mareerey road, 8 3 Jiija village on right, 10 6, road bears sharp left, take track bearing left (NW) which crosses Webi Yaro (Little Jubba), 12.9, Cusman Mooto village turn right along track at village edge, 13.7, turn right from track into grassland, area called Godeey

Layout 10 x 10



Markers for relocation: from raised section of track, site is 108 paces on 251°.

Description

Gently sloping towards marshy area, periodically flooding section of dhesheeg Flooding reduced by Fanoole barrage
Farmed until 3 years ago, abandoned because too wet
Burns most jiilaal.

Grazed seasonally, but not as heavily as might be expected, probably due to tsetse.

Soil Hummocky topography, deep soil, surface has grass and litter with cracks and partial crust Angular and subangular peds break to crumbs and dust. Sticky, moderately plastic
Clay Color (dry) 7 5YR 4/2.

Plant Species On and Around Site

<i>Acacia nilotica</i>	5m	occ
<i>Sesbania sesban</i>	2m	rare
<i>Ormocarpum kirkii</i>	1 5m	occ
<i>Sporobolus helvolus</i>	0 8m	dom
<i>Eriochloa meyerana</i>	1 2m	com
<i>Enicostema axillare</i>	0 7m	com
<i>Ipomoea plebeia</i>	prostrate	occ
<i>Tragia plucknetii</i>	0 2m	occ
unidentified forb	0 1m	rare

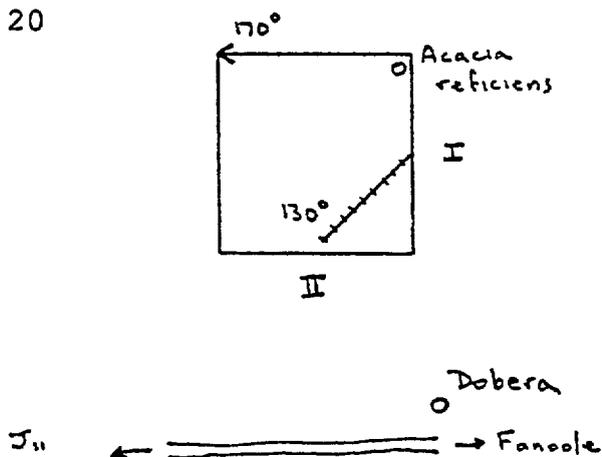
SITE NUMBER 45

Location 4.5 km from Fanoole barrage on 158°
0°43'N, 42°40'E

Established 22 January 1987

Directions: 0, W end of Fanoole barrage, road towards Mareerey, 7.5, site on left side (W) of road (Or 0.7 km N of Jiija on left of road, see site 44)

Layout: 20 x 20



Markers for relocation Dobera tree (2.5 m tall) on W side of road, 33.2 m on 260° to site

Description

Flat marine plain above floodplain

Occasional grazing, browsing and much wood cutting.

Probably occasional burning.

Soil: Deep, thin crust with some small cracks and much grass and litter. Soft soil with weak subangular peds breaking to crumbs and dust. Moderately sticky, moderately plastic.

Silty clay. Color (dry) 10YR 4/2

Plant Species On and Around Site

<i>Combretum hereroense</i>	3m	ab
<i>Acacia reficiens</i>	3m	com
<i>Dichrostachys cinerea</i>	2 6m	com
<i>Euphorbia</i> sp	2 5m	occ
<i>Grewia tenax</i>	1m	occ
<i>Thespesia danis</i>	2m	occ
<i>Cordia sinensis</i>	?	occ
<i>Dobera glabra</i>	4m	occ
unidentified shrub	2m	rare
<i>Enteropogon</i> sp?	0 6m	dom
<i>Eriochloa meyerana</i>	1 2m	com
<i>Sporobolus helvolus</i>	0 6m	com
<i>Solanum hastifolium</i>	0 3m	occ
<i>Solanum</i> sp	0 7m	com

SITE NUMBER 46

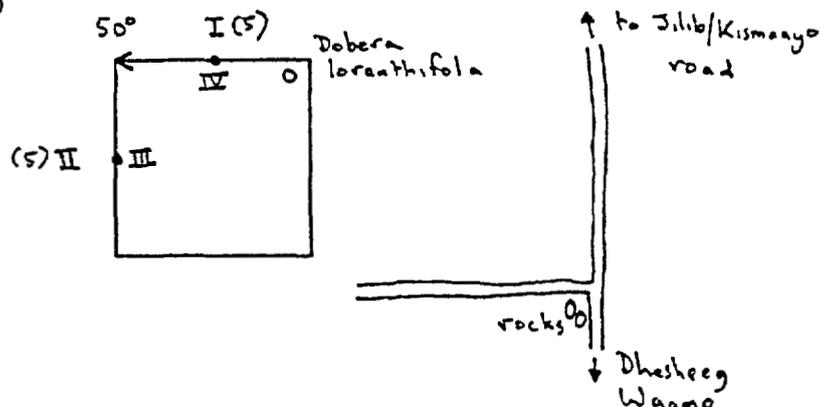
Location 8 km from Jamaame bridge on 253°

0°0'N, 42°37'E

Established 27 January 1987.

Directions 0, Mogambo housing estate, head S, 11 6, pass equator sign; 17 1, turn right on track leading to N edge of Dhesheeg Waamo, 17.4, take small clearing to right for about 20 paces, site is on right.

Layout 20 x 20



Markers for relocation: rocks by roadside, 39 paces on 85° to site (along Dhesheeg Waamo road rocks are 235 paces back (E) from tog crossing road

Description

Oxbow levee which floods occasionally (including 87).

Little sign of grazing, browsing or wood cutting.

Soil Deep; irregular surface with local ponding was cracked with a fragile crust and litter following flooding Soft, no peds, breaks to crumbs and dust Sticky, slightly plastic Clay. Color (moist): 5YR 4/2

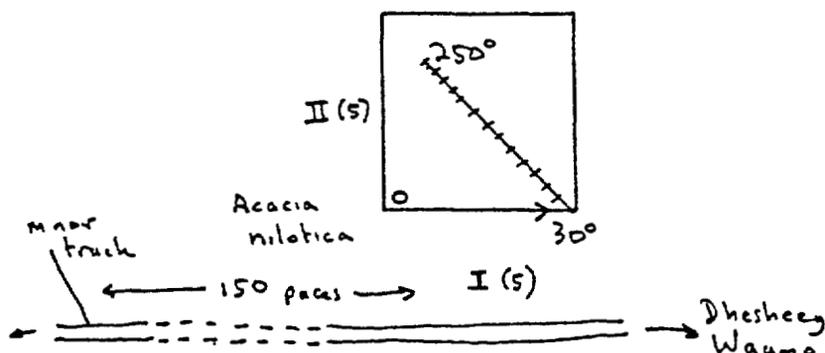
Plant Species On and Around Site

<i>Dobera loranthifolia</i>	6m	dom
<i>Thespesia danis</i>	6m	ab
<i>Acalypha fruticosa</i>	5m	occ
<i>Flueggea virosa</i>	4m	occ
<i>Acacia nilotica</i>	5m	occ
<i>Hyphaene</i> sp (seedlings)	1m	com
<i>Hyphaene</i> sp (mature)	15m	occ
<i>Salvadora persica</i>	?	occ
<i>Combretum hereroense</i>	?	occ
<i>Cordia sinensis</i>	?	com

SITE NUMBER 47

Location & Directions: as for site 46; continue along Dhesheeg Waamo road for 0.5km from 46, site is on left (S)

Layout 10 x 10



Markers for relocation hole by roadside, 11.5m on 288° to site, hole is 150 paces W of where minor track joins road

Description

Floodplain of oxbow (see site 46) which fills from Jubba during major floods including 87 Hummocky surface suggests substantial ponding after rain or flood.

North side of track burned in early jillaal 87, presumably site also burns occasionally

Little grazing or browsing at site, but burned area regeneration heavily grazed in late jillaal. Probably stock route to Waamo rather than grazing area, tsetse common.

Soil: Deep, surface has grass and litter, shallow cracks, small stones and crumbs. Hard with strong subangular peds

Very sticky, slightly plastic

Silty clay Color (dry): 10YR 3/3

Plant Species On and Around Site

<i>Acacia nilotica</i>	3m	occ
<i>Ormocarpum kirkii</i>	1 5m	com
<i>Phyllanthus somalensis</i>	1 5m	com
<i>Terminalia brevipes</i>	1m	com
<i>Dichrostachys cinerea</i>	1m	rare
unidentified shrub	2m	rare
<i>Acacia zanzibarica</i>	4m	occ
<i>Thespesia danis</i>	?	rare
<i>Dobera loranthifolia</i>	5m	rare
<i>Hyphaene</i> sp	10m	rare
<i>Sporobolus helvolus</i>	0 8m	dom
<i>Indigofera</i> sp	0 4m	occ

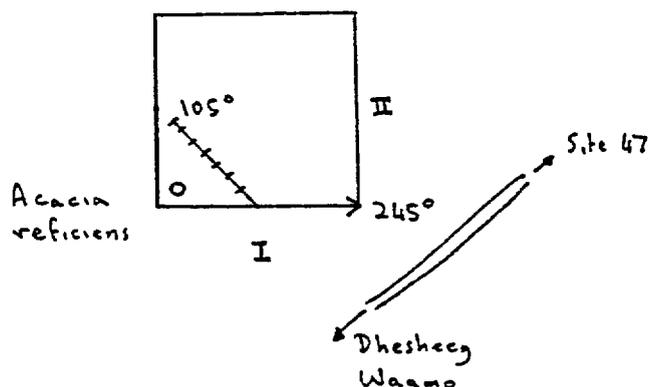
SITE NUMBER 48

Location 8.3km from Jamaame bridge on 263°
0°1'N, 42°36'E

Established 27 January 1987

Directions: from site 47 continue W for 0.8km, site is on right (N)

Layout: 20 x 20



Markers for relocation hole is 21.5m on 73° from site

Description

Level site above floodplain Sandy soil precludes retention of surface water, but well grassed

Little grazing or browsing, some wood cutting

Soil: Deep, surface has sand particles and plant litter.

Hard soil with strong angular peds Moderately sticky, not plastic.

Sandy loam. Color (dry) · 5YR 4/6

Plant Species On and Around Site

<i>Acacia reficiens</i>	2 5m	com
<i>A. zanzibarica</i>	6m	occ
<i>A. bussei</i>	3m	occ
<i>Commiphora campestris</i>	3m	ab
<i>Acalypha fruticosa</i>	2m	com
<i>Boureria lyciacea</i>	2.4m	com
<i>Grewia tenax</i>	2 6m	com
<i>Boscia coriacea</i>	6m	occ
<i>Cordia sinensis</i>	4m	occ
<i>Combretum</i> sp.	3 4m	occ
<i>Sterculia africana</i>	3m	occ
unidentified shrub	1m	rare
<i>Cenchrus ciliaris</i>	0 7m	dom
<i>Enteropogon</i> sp	0.7m	ab
unidentified grass	0 6m	com
<i>Indigofera</i> sp	0 4m	occ

SITE NUMBER 49

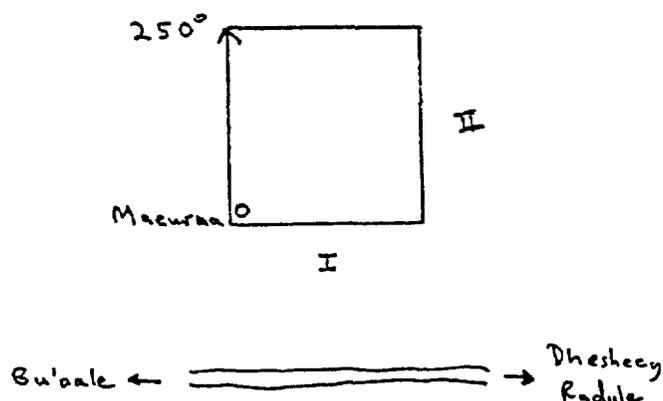
Location 3 3km from Bu'aale bridge on 35°

1°17'N, 42°35'E

Established 30 August 1987.

Directions: 3 6km from Bu'aale hotel on road to Radiile
dhesheeg Site on left.

Layout: 10 x 10



Markers for relocation: prominent roadside *Boscia* tree,
18 4m on 241° to site

Description

Flat, above floodplain chosen as comparison with nearby sites 40 & 50 which are on major stock route This site is crossed by minor stock trails.

Seasonally heavy grazing and browsing, substantial wood cutting.

Soil: Deep; surface has grass and litter and small sand particles and a scattering of very small stones Hard with weak subangular peds breaking to crumbs and sand. Sticky and plastic

Clay loam. Color (moist): surface, 5YR 4/8
below, 2.5YR 4/6.

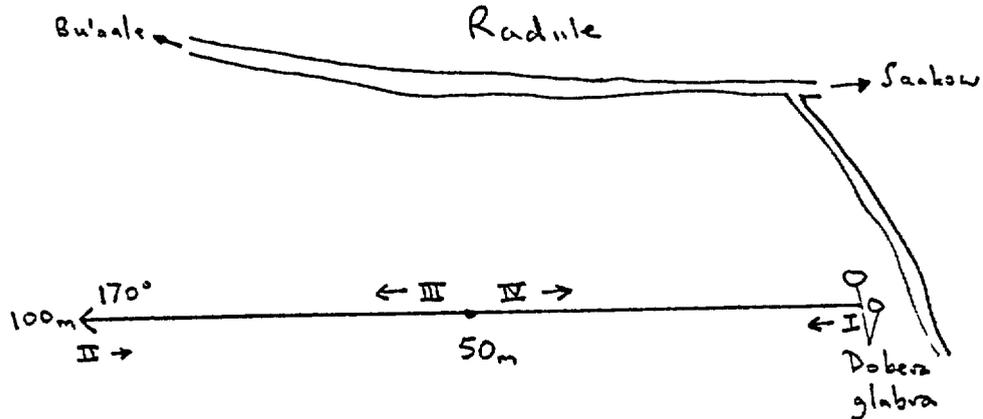
Plant Species On and Around Site

<i>Acacia reficiens</i>	7m	ab
<i>A bussei</i>	3m	com
<i>A senegal</i>	1 3m	occ
<i>Grewia tenax</i>	0 7m	occ
<i>Dobera glabra</i>	8m	occ
<i>Boscia coriacea</i>	0 6m	occ
<i>Maerua sp?</i>	4m	com
unidentified shrub (merdiis)	1m	com
unidentified shrub (geed dhag)	1 5m	rare
<i>Sporobolus agrostoides</i>	0 15m	occ
<i>Tribulus terrestris</i>	prostrate	com
<i>Portulaca kermesina</i>	prostrate succulent	com
<i>Blepharis persica</i>	0 15m	com
<i>Cadaba glandulosa</i>	0 7m	com
unidentified Acanth	0 3m	com
unidentified dwarf shrub	0 5m	com

SITE NUMBER 50

Location & Directions: see site 40.
Established 30 August 1987.

Layout. 4 x 100 belt transect across stock route



Markers for relocation: 235 paces from track junction next to Radiile Livestock startion on 77⁰. See layout Point frames done at 5, 10, 15, ,100m Marker pipes at 0, 3 and 20m

Description

Above floodplain of Radiile dhesheeg which is a major livestock watering point. Ministry of Livestock, Forestry and Range has buildings at dhesheeg
Intensely browsed and grazed, particularly in jillaal, substantial wood cutting Area crossed by many livestock trails
Soil. Deep, surface covered with herbaceous plants and sand grains. Moderately hard with angular peds breaking to soil particles Slightly sticky, moderately plastic.
Sandy clay loam Color (moist) 5YR 4/4.

Plant Species On and Around Site

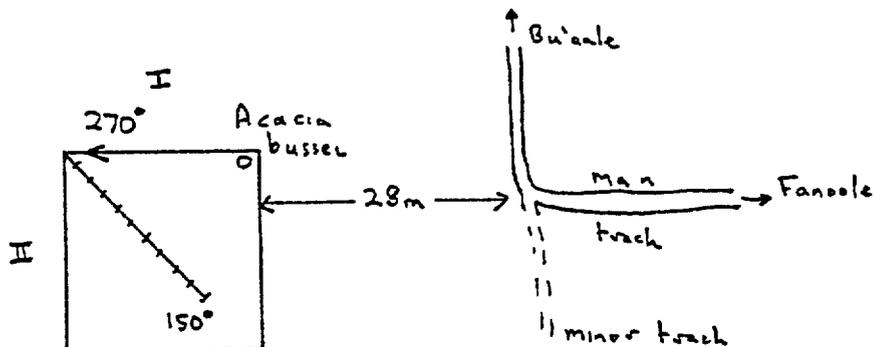
<i>Dobera glabra</i>	5m	occ
<i>Acacia reficiens</i>	1m	occ
<i>A. nubica</i>	2m	ab
<i>A. nilotica</i>	1.5m	rare
<i>A. bussei</i>	1.5m	occ
<i>Thespesia danis</i>	1.5m	com
<i>Anisotes trisulcus</i>	1m	occ
<i>Cordia sinensis</i>	1m	rare
<i>Dactyloctenium scindicum</i>	0 1m	com
<i>Sporobolus agrostoides</i>	0 5m	ab
<i>Digitaria velutina</i>	0 2m	com
<i>Cenchrus ciliaris</i>	0 3m	occ
<i>Urochloa rudis</i>	0 1m	com
<i>Commelina sp</i>	0 1m	com
<i>Aerva persica</i>	0.5m	com
<i>Pedaliium murex</i>	0 1m	com
<i>Ocimum canum</i>	0.2m	ab
unidentified Nyctaginaceae	0 25m	occ
<i>Tribulus terrestris</i>	0 1m	com
<i>Pupalia lappacea</i>	0 25m	com
<i>Ipomoea sinensis</i>	prostrate	com
<i>Cadaba sp</i>	0 5m	occ
<i>Indigofera tinctoria</i>	0 25m	ab
<i>Solanum sp</i>	0 35m	com

SITE NUMBER 51

Location 3.5 km from Fanoole barrage on 296°
0°46'N, 42°38'E
Established 23 January 1988.

Directions 3 km W of site 20 on road to Fanoole, site 30
paces W of distinct bend in track from N/S to E/W

Layout 10 x 10



Markers for relocation: 28m on 273° from bend in track (see above).

Description

Flat marine plain above floodplain. Probably subjected to ponding after rain.

Heavily grazed and browsed seasonally

Soil Deep, surface covered with dead grass and litter. Soft with subangular peds which break to dust. Slightly sticky, moderately plastic.

Silty clay loam Color (dry) 10YR 3/1.

Plant Species On and Around Site

<i>Acacia bussei</i>	4m	occ
<i>A. reficiens</i>	3m	occ
<i>Dobera glabra</i>	8m	occ
<i>Combretum hereroense</i>	1m	occ
<i>Cephalocroton cordofanus</i>	1m	com
<i>Albizia anthelmintica</i>	1m	rare
<i>Setaria incrassata</i>	1 5m	ab
<i>Sporobolus helvolus</i>	0 5m	com
<i>Indigofera sp.</i>	0 3m	com

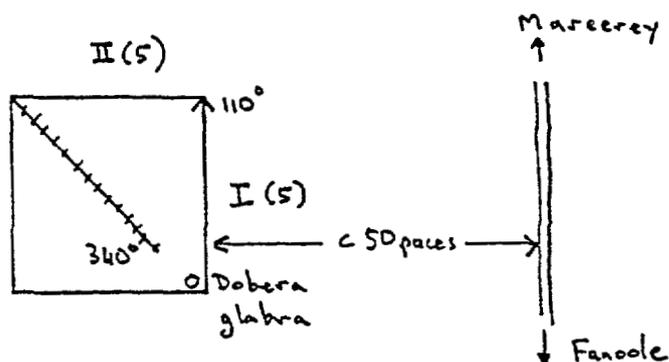
SITE NUMBER 52

Location: 12.5 km from Fanoole barrage on 162°
0°38'N, 42°42'E

Established 27 January 1988

Directions: heading S on Fanoole Mareerey road, 1.5 km from sites 22/23 on left of track, if heading N then 6.7 km N of Garaasey cross-road near site 24

Layout 10 x 10



Markers for relocation hole by road is 51.3m on 23° to site

Description

Flat marine plain, never floods, but may be subject to ponding after rain.
Probably heavily grazed seasonally (moderately when sampled) by cattle moving to water.

Soil: Deep, surface covered with litter and dry grass Soft with weak subangular peds. Sticky, moderately plastic Clay loam/silty clay loam. Color (dry): 2.5YR 3/2

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Plant Species On and Around Site

<i>Commiphora africana</i>	1m	com
<i>Acacia drepanolobium</i>	2m	occ
<i>Dobera glabra</i>	7m	occ
<i>Cordia sinensis</i>	1m	occ
<i>Thespesia danis</i>	1m	occ
<i>Combretum sp</i>	0.5m	com
<i>Ormocarpum kirkii</i>	1m	occ
<i>Cephalocroton cordofanus</i>	1 5m	ab
<i>Sporobolus helvolus</i>	0 5m	com
<i>Digitaria milaniana</i>	1m	ab
<i>Cadaba sp</i>	0 8m	occ

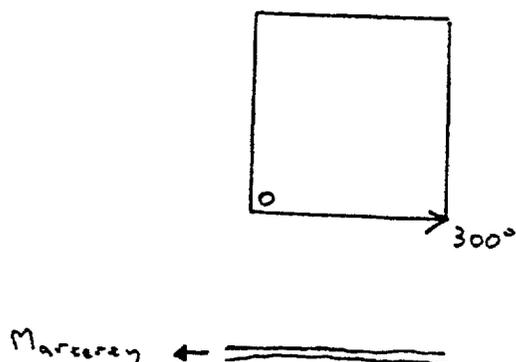
SITE NUMBER 53

Location: 10.5 km from Juba Sugar factory on 305°
0°30'N, 42°37'E

Established 28 January 1988

Directions 0, main cross road at Juba Sugar, 0.8, turn left (N), 1.1, left (W) on to small track, 2.1, left around waste ponds, 3.1 left (W) at cross road, 7.4, bear right (NW) leaving track to Afmaadow, 14.7, site on left near large (unarmed) Acacia tree (At 15.0 track ends at E/W T-junction)

Layout hole at roadside; 21.6 m on 220° to site.



Description

Secondary Jubba floodplain of Far Shabeele. Semi-deciduous forest

Substantial wood cutting, most species coppice shrubs as a result.

Soil. Deep, covered with leaf and wood litter and sand particles. Hard, weak angular peds. Not sticky or plastic Consolidated loamy sand. Color (dry) 10YR 5/3.

Plant Species On and Around Site

<i>Acacia macaluso1</i>	20m	occ
<i>Acacia eliator</i> ?*	20m	com
unidentified shrub (dhebi)	5m	ab
unidentified shrub (wanaylu)	8m	com
<i>Grewia tenax</i>	1 5m	com
<i>Thespesia danis</i>	2m	occ
<i>Hyphaene</i> sp	20m	occ
unidentified climber	2m	occ
<i>Ziziphus</i> sp	3m	occ

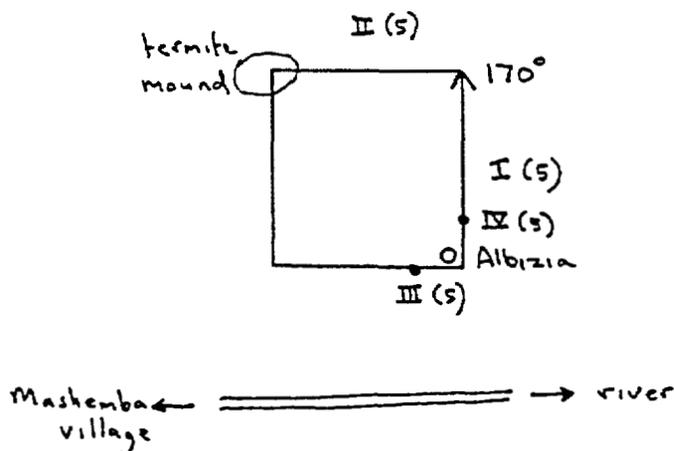
* may be armed *A macaluso1*

SITE NUMBER 54

Location. 20km from Fanoole barrage on 157°
0°34'N, 42°44'E
Established 31 January 1988.

Directions from Jilib take road (N) passing Fanoole HQ, 0, bridge over main canal, 6 2, Madhooka village; 12 8, Buurdheer village turn left (W), 13.5m, Mashemba village, 14 3, site on left just after transition from red to brown soil.

Layout. 20 x 20



Description

Semi-deciduous forest above floodplain level, probably obtains sub-surface water from river floods or runoff
Mostly flat, but local ponding likely.
Heavily cut for wood resulting in coppice shrubs; substantial seedling regeneration
Soil Deep, surface has leaf litter and coarse sand particles Hard with weak subangular peds. Slightly sticky, not plastic
Consolidated sand. Color (dry) 10YR 4/3

Plant Species On and Around Site

<i>Albizia anthelmintica</i>	15m	occ
<i>Balanites</i> sp.	7m	com
<i>Dobera loranthifolia</i>	12m	occ
<i>Thespesia danis</i>	9m	occ
<i>Vepris eugenifolia</i>	3m	occ
<i>Elaeodendron aquifolium</i>	1m	occ
<i>E schwinfurthiana</i>	5m	rare
<i>Lecaniodiscus fraxinifolius</i>	8m	occ
<i>Mimusops fruticosa</i>	2m	rare
<i>Maerua</i> sp?	1 5m	occ
lafaay, deciduous shrub	7m	com
cusmaan dooy, evergreen shrub	5m	ab
uuhey, evergreen (?) shrub	1.8m	rare
geed cade, evergreen shrub	6m	rare
dhowey, deciduous shrub	4m	com
geed gamooney, evergreen shrub	3m	occ
dharab, evergreen shrub	6m	com
<i>Rinorea elliptica</i>	4m	locally ab (off site)
<i>Sansevieria</i> sp.	1m	occ

NOTE:

Site numbering began with #1 South of the proposed
Dam Site and with #60 North of the proposed Dam Site

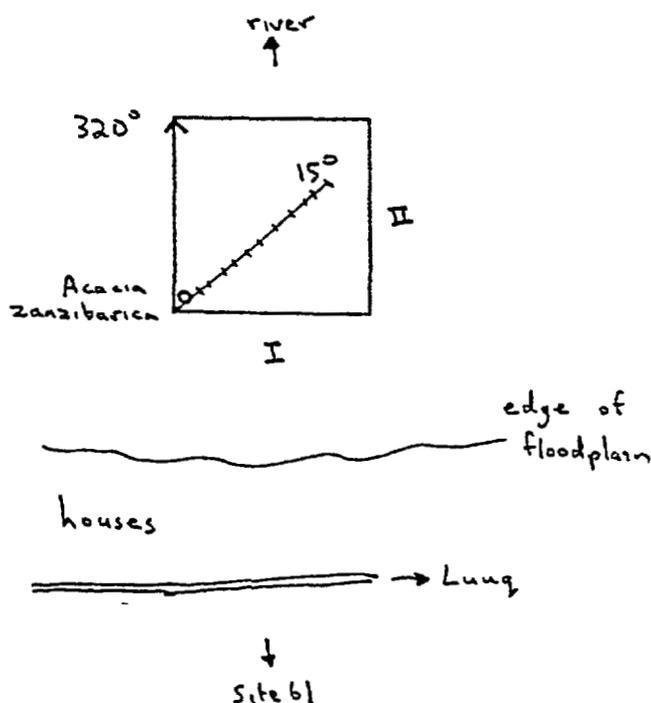
There are no sites 55-59.

SITE NUMBER 60

Location: 17km from Luuq on 195°
3°40'N, 42°30'E
Established 5 July 1987.

Directions 0, S of Luuq bridge take Baydhabo road, 5 3, track to right, 8 8, turn left alongside fenced enclosure, 11.8, cross Tog Daydheere, 12.3, fork right, 15 1, either fork ok, 17 3, fork right, 17 9, fork right, 19.4, fork right, 20 3, fork left, 21 5, huts and site to right of road, area called Maraayli

Layout 10 x 10



Markers for relocation 128 paces off road down slope, pile of stones 42m on 310° to site

Description

Flat floodplain near river. Cultivated previous year, flooded gu' 87.

Seasonally grazed and browsed

Soil Cracked with surface flakes resulting from flood/drying Deep, weak sub-angular peds Non sticky, weakly plastic

Fine sandy loam Color surface (dry) 10YR 6/4
below (slightly damp) 7 5YR 4/4

PLANT SPECIES ON AND AROUND SITE

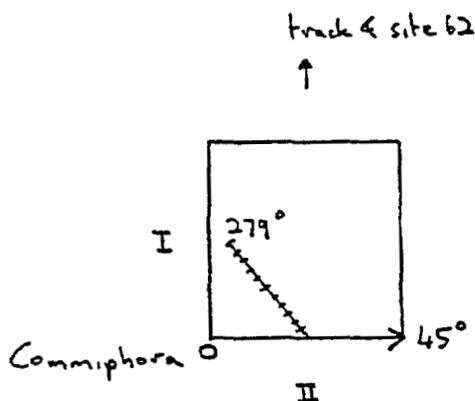
<i>Acacia zanzibarica</i>	4-5m	com
<i>Sporobolus helvolus</i>	0 5m	dom
<i>Echinochloa colona</i>	0 5m	sub-dom
<i>Paspalidium desertorum</i>	0 5m	com
<i>Chloris virgata</i>	0 6m	occ
<i>Eriochloa fatmensis</i>	0 5m	occ

SITE NUMBER 61

Location as for site 60
Established 5 July 1987

Directions as for site 60, 61 is to right of road, upslope,
c 100m on 137° from huts.

Layout 20 x 20



Markers for relocation 24 5m from rock pile on 120° to
site.

Description

Gently sloping limestone hillside with some outcropping
Heavily grazed and browsed over long-term.

Soil Shallow, surface cover of stones from a few mm to
>10cm. Beneath, soil between stones is not sticky or
plastic.

Stony sandy loam Color (dry): 7 5YR 6/6.

Plant Species On and Around Site

<i>Acacia horrida</i>	2m	com
<i>Anisotes trisulcus</i>	1 5m	occ
<i>Solanum jubae</i>	2 2m	occ
<i>Cordia</i> sp	0 4m	occ
<i>Grewia tenax</i>	1m	rare
<i>Grewia</i> sp	0 5m	rare
<i>Caesalpinia</i> sp	0 8m	rare
<i>Commiphora campestris</i>	4m	occ
<i>Aerva persica</i>	0 8m	com
<i>Pavonia arabica</i>	0 3m	rare
<i>Barleria proxima</i>	0 25m	occ
<i>B quadrispina</i>	0 25m	rare
several unidentified species		

SITE NUMBER 62

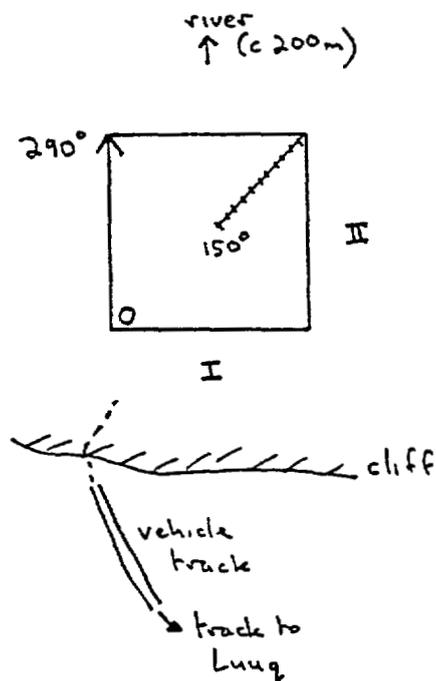
Location, 12km from Luuq on 195°

3°40'N, 42°32'E

Established 6 July 1987

Directions 0, Tog Dhaydheere (see site 60) proceeding S,
2 1 track to right (W), after 250m track ends at cliff;
descend to site

Layout 20 x 20



Markers for relocation 47 3m from cliff on 272° to site.

Description

Upper floodplain with gentle slope towards river c 200m W.

Floods on the "10 year" flood including 87

Probably grazed and browsed seasonally

Soil. Deep, finely cracked surface with silty flakes

following flood No ped formation Not sticky or plastic

Sand/loamy sand Color: surface (dry) 10YR 5/6

below (moist) 7.5YR 5/4

Plant Species On and Around Site

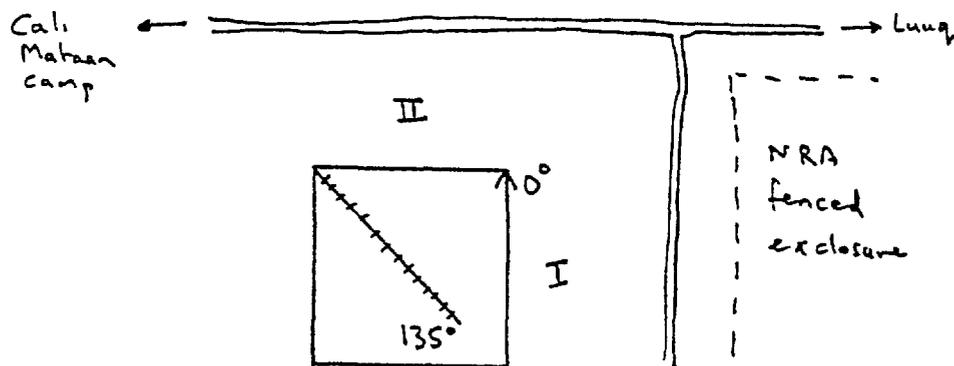
<i>Salvadora persica</i>	3m	com
<i>Acacia zanzibarica</i>	7m	com
<i>Lawsonia inermis</i>	3m	occ
<i>Sporobolus helvolus</i>	0 3m	com
<i>Heliotropium aegyptiacum</i>	0.3m	com
<i>Enicostema axillare</i>	0 15m	com
<i>Amaranthus sparganiocephalus</i>	0 3m	occ
<i>Gossypium benadirensense</i>	0 15m	occ
<i>Farsettia robecchiana</i>	0 45m	rare
<i>Celosia polystachia</i>	1 5m	rare
collected below site,		
<i>Cyperus</i> sp nov	0.5m	locally dominant
<i>Ziziphus mauritania</i>	15m	rare on river bank
collected on cliff		
<i>Barleria</i> sp ? nov aff <i>proxima</i>		
<i>Reseda ellenbeckii</i>		

SITE NUMBER 63

Location 7 km from Luug on 175°
3°44'N, 42°33'E
Established 6 July 1987

Directions From NW corner of fenced enclosure (see site 60, 8 8km) 88 paces S along fence, then 68 paces W away from fence

Layout 10 x 10



Markers for relocation Hole by roadside, 21 6m on 270° to site

Description

Sandy flat plain; vegetation devastated because of proximity to Cali Mataan refugee camp. Overgrazed, overbrowsed and overcut.

Soil Deep, undisturbed surface has thin wind-stable coat of coarse quartz sand and pisolitic laterite. No peds, breaks to alluvial sand Not sticky or plastic.
Sand (slightly loamy). Color (almost dry) 5YR 5/6.

Plant Species On and Around Site

<i>Ziziphus hamur</i>	1m	occ
<i>Acacia horrida</i>	1m	occ
<i>Calotropis procera</i>	0 6m	rare
<i>Jatropha rivae</i>	1 2m	occ
<i>Aerva persica</i>	0 6m	com
<i>Heliotropium zeylanicum</i>	0 4m	rare
<i>Boerhavia sp aff repens</i>	0 2m	com
<i>Cleome brachycarpa</i>	0 2m	com
<i>Zaleya pentandra</i>	0 1m	occ
<i>Cassia sp</i>	0 3m	com
unidentified Malvaceae	0 3m	occ

SITE NUMBER 64

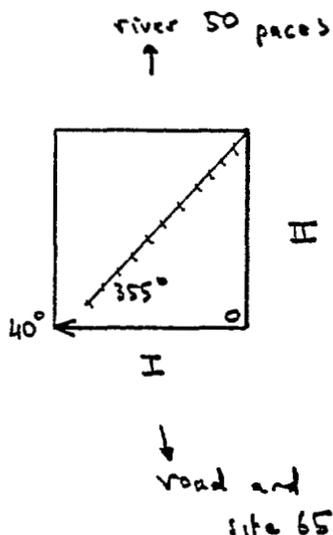
Location 3.5 km from Luuq on 320°

3°49'N, 42°31'E

Established 7 July 1987

Directions. 0, W end of Luuq bridge; turn first right through Horseed refugee camp heading N; 3.1, fork left, 4.9, enclosure to right (site 64 c 50m inside), hill slope to left (site 65 c 50m up slope). Area called Sulalla

Layout: 10 x 10



Markers for relocation hole at roadside, 50m on 105° to site.

Description

Flat floodplain rarely floods completely (last time 1977; partial flooding 87) Cultivated sometimes (last time 3 years ago), otherwise left for dry season grazing.

Soil Deep, surface partly covered by silty flakes following flood. No peds, breaks to sand grains. Not sticky, very slightly plastic.

Loamy sand. Color: surface (dry) 7.5YR 5/6
below (damp) 5YR 4/4.

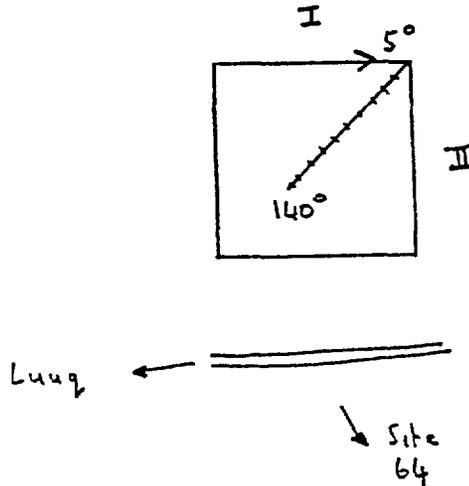
Plant Species On and Around Site

<i>Salvadora persica</i>	4 5m	com
<i>Hyphaene</i> sp (seedlings)	0 6m	rare
<i>Acacia zanzibarica</i>	4m	occ
<i>Ziziphus hamur</i>	1m	occ
<i>Cassia racemosa</i>	1 5m	com
<i>Sesbania</i> sp	1m	rare
<i>Eragrostis cilianensis</i>	0 2m	com
<i>Chloris</i> sp	0 4m	com
<i>Dactyloctenium aegyptium</i>	0 3m	com
<i>Acrachne racemosa</i>	0 4m	com
<i>Latipes senegalense</i>	0 25m	com
<i>Cenchrus ciliaris</i>	0 4m	occ
<i>Setaria verticillata</i>	0 5m	rare
<i>Boerhavia elegans</i>	0 8m	com
<i>Abutilon anglosomaliae</i>	2 5m	rare
<i>Tribulus terrestris</i>	prostrate	com
<i>Convolvulus capituliferus</i>	prostrate	rare
<i>Heliotropium aegyptiacum</i>	0 3m	occ
<i>H. zeylanicum</i>	0 3m	com
<i>Gynandra gynandrosis?</i>	0.4m	occ
<i>Celosia polystichia</i>	0 5m	rare
<i>Aerva persica</i>	0 5m	occ
curcubit (unidentified)	prostrate	occ

SITE NUMBER 65

Location & Directions see site 64
Established 7 July 1987

Layout: 10 x 10



Markers for relocation hole by road side, 36.4m on 275° to site.

Description

Hillside above floodplain Stunted vegetation suggests heavy grazing and browsing pressure.

Soil Deep, surface has wind-stable coarse sand layer where undisturbed No peds Not sticky or plastic.
Sand. Color (almost dry) 10YR 6/4.

Plant Species On and Around Site

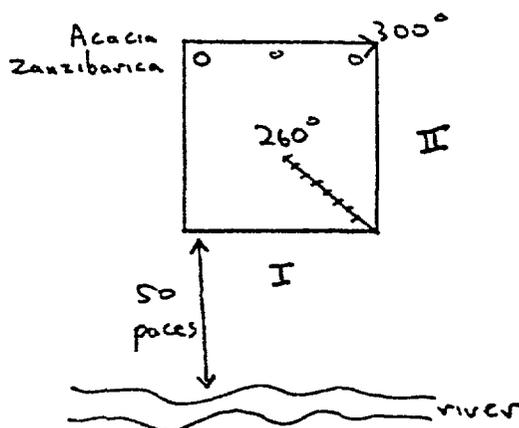
<i>Cassia racemosa</i>	1 6m	dom
<i>Ziziphus hamur</i>	0.3m	occ
<i>Acacia tortilis</i>	0 3m	occ
<i>Eragrostis ciliaris</i>	0 15m	dom
<i>E cilianensis</i>	0 15m	com
<i>Indigofera sp aff spinosa</i>	0 15m	occ

SITE NUMBER 66

Location 17km from Luuq on 205°
3°39'N, 42°29'E
Established 8 July 1987

Directions: 0, W end Luuq bridge; 0.7, turn left (S), 11.9, S end of Maganey refugee camp, 12.8, fork right, 18.8, small sunken lake and spring (Garab Jeeloo), turn left on far side, 22.0 reach tog, cross and go to Jubba bank, site is 50 paces left along bank, then 50 paces "inland" Area called Boorow Sikuure

Layout 20 x 20



Markers for relocation: prominent grave site; 75.7m on 140° from graves to site.

Description

Level area of floodplain with lines of trees and annual forbs growing in cracks between flood-deposited clayey alluvium. Flooded gu' 87.

No obvious signs of browsing or grazing, possibly because of recent flood. Likely to be used by livestock during dry seasons since near accessible riverine watering point.

Soil: Deep, older alluvium overlain by 30-40cm of clayey sediment

Surface is hard, plastic, sticky clay; beneath is loose, non-sticky, moderately plastic sandy loam. Color (both layers): 7.5YR 5/4

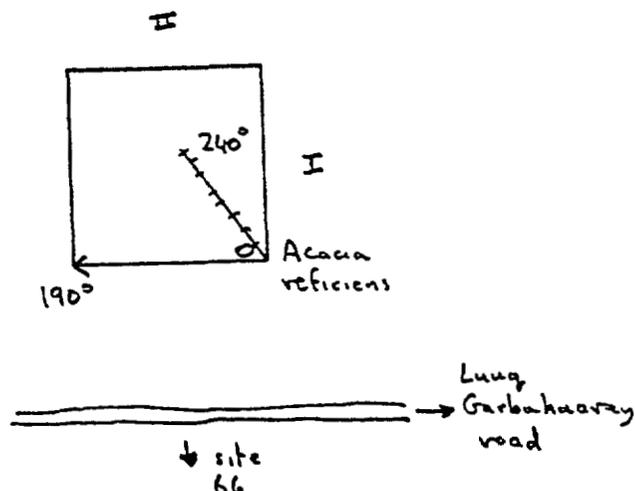
Plant Species On and Around Site

<i>Acacia zanzibarica</i>	7m	dom
<i>Dactyloctenium aegyptium</i>	0 2m	rare
<i>Dinebra retroflexa</i>	0 25m	rare
<i>Eragrostis cilianensis</i>	0 2m	rare
<i>Echinochloa colona</i>	0 3m	rare
<i>Setaria verticillata</i>	0 25m	rare
<i>Cyperus grandibulbosus</i>	0 1m	occ
<i>Heliotropium aegyptiacum</i>	0 25m	dom
<i>Leucas nubica</i>	0 3m	sub-dom
<i>Tribulus terrestris</i>	prostrate	rare
<i>Senra incana</i>	0 25m	rare
<i>Amaranthus graecizans</i>	0 5m	rare
<i>Digera muricata</i>	0 25m	rare
<i>Zygophyllum simplex</i>	prostrate	rare
<i>Cleome sp</i>	0 25m	rare
curcubit	prostrate	occ

SITE NUMBER 67

Location & Directions: see site 66.
Established 8 July 1987

Layout 20 x 20



Markers for relocation Site is 0.1 km back along track from tog near site 66. Pile of rocks by side of track (to left when travelling back from 66), 27.4m on 265° upslope to site 67.

Description

Limestone slope above floodplain with massive outcrops and loose stones.

Signs of substantial browsing and wood cutting, probably related to nearby nomadic camp (may be semi-permanent)

Soil Shallow, outcrops and stones with finer soil beneath latter. Finer soil has no peds and is neither sticky nor plastic.

Gritty silty loam. Color (dry): 10YR 7/6.

Plant Species On and Around Site

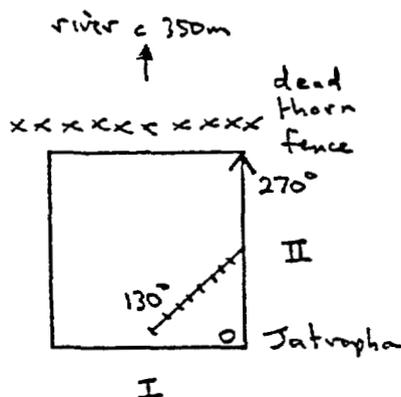
<i>Acacia reficiens</i>	4m	dom
<i>A. horrida</i>	1m	occ
<i>Commiphora</i> sp	4m	rare
<i>Grewia tenax</i>	2m	com
<i>G. villosa</i>	0 15m	rare
<i>Ziziphus hamur</i>	2m	com
<i>Cordia sinensis</i>	1 5m	occ
<i>Solanum jubae</i>	2m	rare
<i>Maerua</i> ?	3 5m	occ
unidentified shrub	1 6m	occ
unidentified climber	3m	occ
<i>Sericocomposis hildebrandtii</i>	0.4m	occ
<i>Dactyloctenium</i> sp	0.1m	rare
<i>Sporobolus helvolus</i>	0 25m	com
<i>Justicia</i> sp aff. <i>odora</i>	0 25m	com

SITE NUMBER 68

Location 16.5 km from Luuq on 200°
3°40'N, 42°30'E
Established 9 July 1987

Directions. 0, N end of fenced enclosure S of Luuq (see site 60), 14.5, along main track (beyond turn for site 62) which ends Site c. 100m further at junction of floodplain Area called Maraayle or Aw Mad Madoole (Opposite site 66 on W bank)

Layout 20 x 20



Markers for relocation: rock pile beyond end of track, 3.4m on 300° to site

Description

Gentle gypseous limestone slope just above the floodplain alluvium
87 flood said to cover part of site, but not evident from vegetation, therefore probably very short inundation.
Signs of heavy browsing periodically, thought not of current growth
Soil Moderate depth, surface covered with small/medium stones with some limestone outcropping. Finer soil beneath surface stones has no peds, few stones. Not sticky or plastic
Stony fine sandy loam. Color. 10YR 6/4

Plant Species On and Around Site

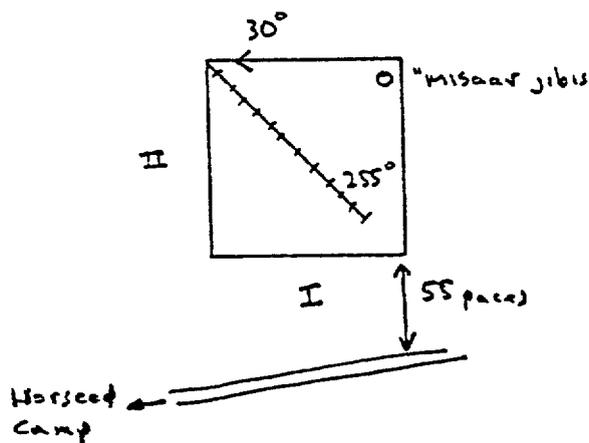
<i>Ziziphus hamur</i>	1.5m	com
<i>Jatropha rivae</i>	3m	com
<i>Solanum jubae</i>	0 9m	occ
<i>Combretum hereroense</i>	1 5m	com
<i>Acacia reficiens</i>	0 75m	occ
<i>A. senegal</i>	0 7m	occ
<i>A horrida</i>	0 5m	rare
<i>Grewia tenax</i>	1m	rare
<i>Grewia sp</i>	2m	occ
<i>Salvadora persica</i>	1 8m	rare
unidentified bush	0 4m	com
<i>Aristida mutabilis</i>	0 15m	com
<i>Tribulus terrestris</i>	prostrate	com
<i>Aerva persica</i>	0 3m	occ
<i>Cleome sp</i>	0 2m	rare
<i>Barleria argentea</i>	0 3m	rare
<i>B. quadrispina</i>	0 2m	rare
<i>Hibiscus somalensis</i>	0.1m	rare

SITE NUMBER 69

Location 2km from Luuq on 240°
3°47'N, 42°32'E
Established 9 July 1987

Directions 0, W end of Luuq bridge, 0 7, turn right (S),
1 8, site c. 50m to right, S end of Horseed refugee camp

Layout. 10 x 10



Markers for relocation 58m from roadside hole on 140° to
site (corner tree is isolated misaar jibis)

Description

Sandy alluvial plain next to refugee camp, vegetation devastated by cutting, grazing and browsing. Sandy soil allows rapid infiltration.

Soil: Deep, surface has 1-2cm of loose quartz sand No real ped formation, but sand is consolidated. Not sticky or plastic.

Slightly loamy sand. Color (dry) · 5 YR 6/8.

Plant Species On and Around Site

[due to poor condition names not necessarily reliable]

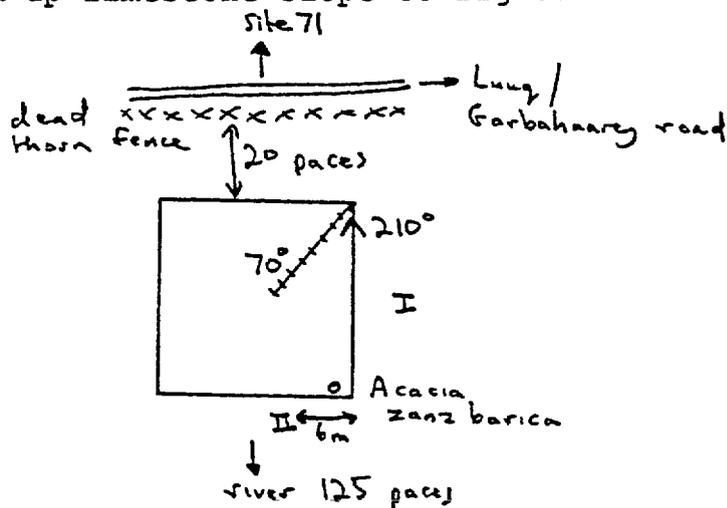
unidentified tree (Misaar jibis)	2m	rare
<i>Anisotes trisulcus?</i>	0 3m	occ
<i>Acacia reficiens</i>	0 7m	occ
<i>A. horrida</i>	0 25m	occ
<i>Dactyloctenium</i> sp?	prostrate	com
<i>Eragrostis cilianensis</i> ?	0 1m	com
<i>Boerhavia</i> sp?	prostrate	com
<i>Indigofera</i> sp	0 1m	occ
<i>Cassia racemosa?</i>	0 1m	com
unidentified plant	0 2m	com

SITE NUMBER 70

Location 29km from Luuq on 205°
3°32'N, 42°29'E
Established 10 July 1987.

Directions: 0, W end of Luuq bridge, 0 7, turn left (S) road to Garbahaarey ; 39 1, turn left on to track towards river (1 7km after large termite mound on road), 56 7, road reaches thorn enclosure; turn right (S) for c 50m (left leads to stock watering point). Site 70 is inside enclosure, site 71 is c 30m up limestone slope to right.

Layout 10 x 10



Markers for relocation: hole at roadside, 26.7m on 50° to site

Description

Floodplain towards inland side; cultivated until 3 years ago.

Flooded in 87, but near to upper limit.

Grazed in dry season.

Soil Deep, surface has recent layer of flood-deposited sediment cracking into silty flakes. Hard angular peds

Moderately sticky, moderately plastic

Silty loam/silty clay loam. Color (almost dry) 7 5YR 5/4

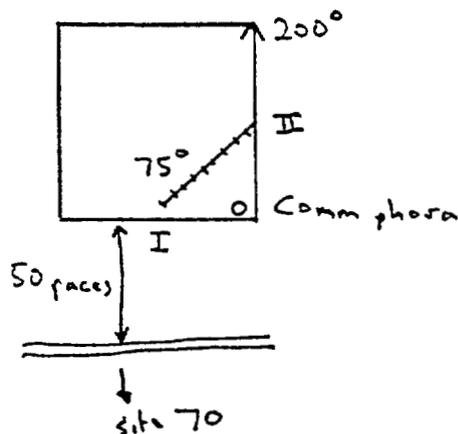
Plant Species On and Around Site

<i>Acacia zanzibarica</i>	12m	dom
<i>Lawsonia inermis</i>	3 5m	occ
<i>Cordia sinensis</i>	2m	occ
<i>Sporobolus helvolus</i>	0 5m	dom
<i>Chloris virgata</i>	0 5m	com
<i>Eriochloa fatmensis</i>	0 4m	com
<i>Paspalidium desertorum</i>	0 8m	com
<i>Eragrostis aethiopica</i>	0 25m	occ
<i>Digera muricata</i>	0 5m	com
<i>Chorchorus olitorius</i>	1m	com
<i>Solanum coagulans</i>	0 25m	com

SITE NUMBER 71

Location & Directions: see site 70
Established 10 July 1987

Layout: 20 x 20



Markers for relocation: from hole (see site 70), 37m on 197°

Description

Rocky limestone slope above floodplain with massive outcrops and stony patches.

Browsed

Soil: Shallow with patches of finer soil between outcrops and beneath stones Stony soil with no peds. Not sticky, very slightly plastic

Gritty clay loam. Color (dry) 7 5YR 7/6.

Plant Species On and Around Site

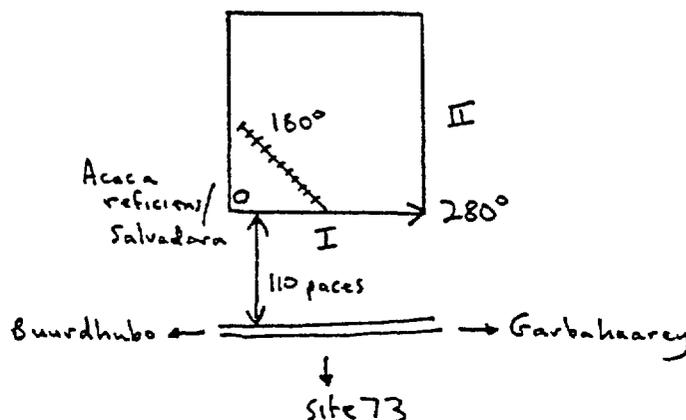
<i>Acacia horrida</i>	0 15m	rare
<i>A reficiens</i>	3 5m	com
<i>Commiphora</i> sp	4 5m	occ
<i>Euphorbia cuneata</i>	1.5m	com
<i>Jatropha rivae</i>	2 5m	occ
<i>Lanea</i> sp	2m	occ
<i>Grewia tenax</i>	1 2m	com
<i>Cordia sinensis</i>	2m	rare
<i>Dactyloctenium aegyptium</i>	0 3m	occ
<i>Tetrapogon tenellus</i>	0.4m	occ
<i>T. cenchroidiformis</i>	0 3m	com
<i>Eragrostis cilianensis</i>	0 2m	occ
<i>Farsetia robecchiana</i>	0 3m	occ
<i>Aerva persica</i>	0 4m	occ
<i>Justicia</i> sp aff <i>odora</i>	0 25m	com
capparid shrub	0 7m	rare
2 unidentified plants	0 3m	occ

SITE NUMBER 72

Location: 26km from Garbahaarey on 130°
3°12'N, 42°24'E
Established 12 July 1987

Directions: 0, Garbahaarey police check point, head S; 14 0,
fork left (E) to Buurdhubo road, 28 0, site 72 c 100m on
right (S) of road, site 73 c 50m on left (N) of road

Layout 20 x 20



Markers for relocation hole off road, 100m, on 280° to site.

Description

At base of gentle slope from road. Gypseous soils have been deposited from a higher ridge.

Above floodplain, but undulating site ponds rain water and is generally poorly drained.

Seasonally grazed and browsed

Soil Deep, largely bare soil puffed up and gypseous Some silty flakes on surface which also has crumbs and some small pisolitic laterite No peds. Non sticky, very slightly plastic

Fine loamy sand. Color (dry). 5YR 6/8

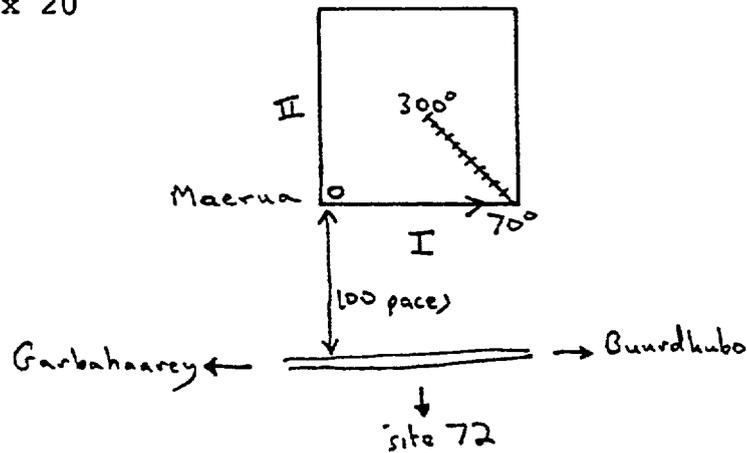
Plant Species On and Around Site

<i>Acacia reficiens</i>	2 5m	com
<i>Salvadora persica</i>	4 5m	com
<i>Cordia sinensis</i>	0 8m	com
<i>Eragrostis</i> sp	0 1m	occ
<i>Sporobolus</i> sp	0 25m	occ
<i>Sporobolus</i> sp(=Beckett 562)	prostrate	com
unidentified grass	0 3m	com
<i>Zygophyllum simplex</i>	prostrate	com
<i>Cadaba glandulosa</i>	0 3m	com

SITE NUMBER 73

Location & Directions. see site 72

Layout 20 x 20



Markers for relocation hole and rocks near road, 90m on 350° to site

Description

Higher on slope than site 72, mainly limestone with less gypseous deposition Better drained and vegetated than site 72.

Seasonally browsed.

Soil Shallow, surface mostly covered by mantle of stones
No peds, but soil hard and consolidated. Moderately sticky, plastic

Silty clay loam Color (dry): 7 5YR 7/6.

Plant Species On and Around Site

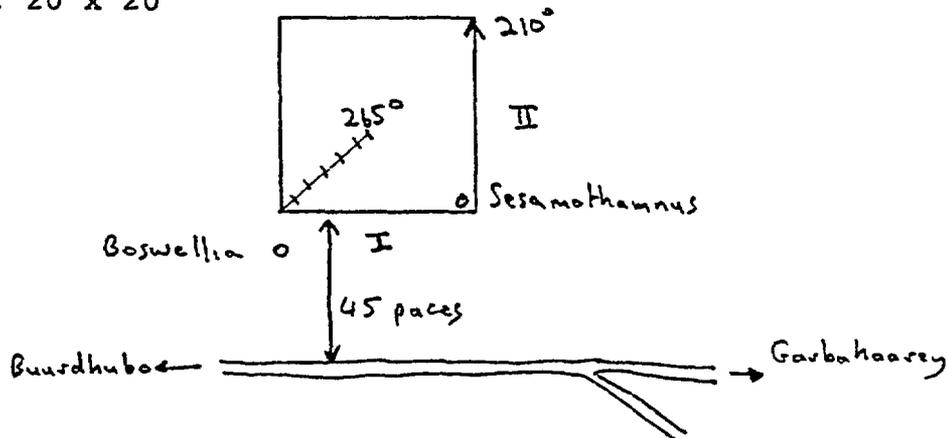
<i>Maerua sessiliflora</i>	3 5m	occ
<i>Combretum hereroense</i>	1 7m	rare
<i>Acacia reficiens</i>	2 5m	com
<i>Cordia sinensis</i>	1 2m	occ
<i>Grewia tenax</i>	0 3m	rare
<i>Terminalia parvula</i>	1 5m	rare
<i>Aristida</i> sp	0 3m	com
<i>Aerva persica</i>	0 4m	occ
<i>Farsetia robecchiana?</i>	0.25m	rare
unidentified Malvaceae	0 3m	occ

SITE NUMBER 74

Location 25km from Garbahaarey on 130°
3°12'N, 42°24'E
Established 12 July 1987

Directions: 0, Garbahaarey police check-point, head S, 14 0,
fork left, 26.9, site on right of road.

Layout: 20 x 20



Markers for relocation: hole and rocks by road, 46 4m on
190° to site

Description

Higher than site 73, but otherwise very similar land
(although species quite different). Massive limestone
outcrops from a gentle slope.

Soil: Shallow; surface mostly covered by stone mantle. Finer
particles have no peds; slightly sticky, moderately plastic.
Silty clay loam Color (dry) 7 5YR 6/8

Plant Species On and Around Site

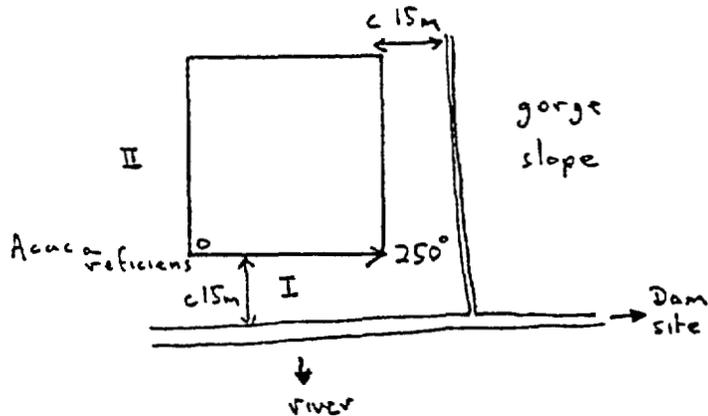
<i>Sesamothamnus busseanus</i>	6m	com
<i>Commiphora</i> sp	2 5m	occ
<i>Boswellia</i> sp	4m	rare
<i>Euphorbia cuneata</i>	3 5m	com
<i>Acacia tortilis</i>	1 5m	occ
<i>A. horrida</i>	0 8m	rare
<i>Dalbergia commiphoroides</i>	1.5m	com
<i>Ziziphus hamur</i>	1 5m	occ
<i>Cordia sinensis</i>	2 2m	occ
<i>Grewia tenax</i>	1 5m	com
<i>Grewia</i> sp	1.5m	occ
<i>Gardenia florii</i>	1.5m	rare
<i>Maerua sessiliflora</i>	3 5m	rare
<i>Solanum jubae</i>	1 5m	rare
<i>Solanum</i> sp	0 8m	rare

SITE NUMBER 75

Location 1km from dam site on 50°
2°37'N, 42°20'E
Established 14 July 1987

Directions. 0, dam site (E), continue N on track for 1 km

Layout 10 x 10



Markers for relocation: rocks next to track, 22.7m on 145° to site.

Description

Steep rocky slope of gorge
Little sign of browsing

Soil: Shallow, comprises large rocks up to 1m wide Small amount of gritty finer soil is slightly sticky and slightly plastic

Sandy clay loam between rocks Color (dry) 10YR 7/6.

Plant Species On and Around Site

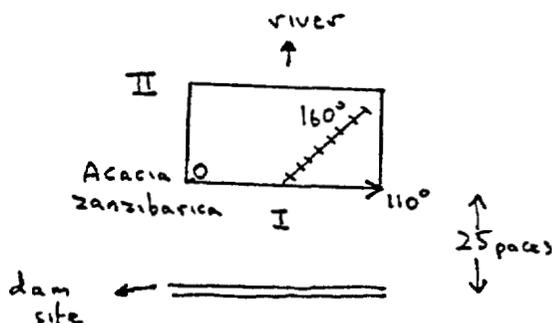
<i>Commiphora</i> sp	4m	com
<i>Sericocomopsis hildebrandtii</i> ?	1.4m	com
<i>Acacia reficiens</i>	3 5m	com
<i>A. horrida</i>	0.8m	rare
<i>Anisotes trisulcus</i>	1m	com
<i>Balanites</i> sp.	4m	com
<i>Grewia tenax</i>	1.5m	com
<i>Cordia sinensis</i>	3m	occ
<i>Euphorbia cuneata</i>	1 5m	occ
<i>Maerua</i> sp ?	2m	rare
<i>Satanocrater</i> sp	1 5m	com
<i>Andropogon kelleri</i>	1 2m	com
unidentified Malvaceae	1 2m	occ
<i>Asparagus</i> sp	1m	rare
<i>Indigofera</i> sp	0 25m	rare

SITE NUMBER 76

Location 5km from dam site on 80°
2°37'N, 42°22'E
Established 14 July 1987

Directions along track N, 2.9km from site 75.

Layout. 20 x 10



Markers for relocation: 25 2m from gap in thorn fence on 36° to site

Description

Flat part of floodplain behind levee. On river side of levee is almost pure stand of *Tamarix aphylla* and on back side, *Salvadora persica*. Inland of the site is an ecotone to the gorge slope with *Albizia anthelmintica* and *S. persica*. Site was cultivated many years ago.

Grazed and browsed, probably year round, more intensively in dry seasons

Soil Deep, surface has silty flakes following 87 flood and subsequent drying. Weak sub-angular peds. Slightly sticky, highly plastic

Silty clay loam. Color (dry) surface, 10YR 6/3
below, 10YR 4/4

Plant Species On and Around Site

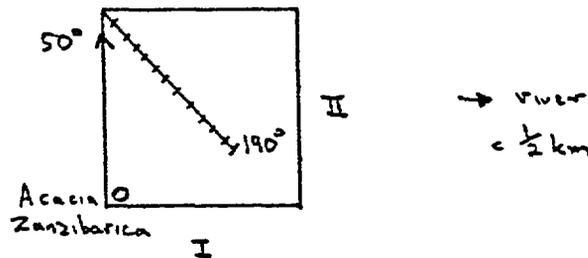
<i>Acacia zanzibarica</i>	8 5m	dom
<i>Echinochloa colona</i> ?	0 25m	co-dom
<i>Nothosaerva brachiata</i>	0.15m	co-dom

SITE NUMBER 77

Location 31km from Garbahaarey on 80°
3°22'N, 42°30'E
Established 16 July 1987

Directions 0, beginning of road N in Buurdhuubo refugee camp, 21 9, pass concrete block buidings in Malka camp, continue N parallel to river, 26 9, stop on hill by enclosure (site below hill in tog). Area called Dhuuroole

Layout 10 x 10



Markers for relocation c 49 paces from rock next to thorn fence on 65° (36° from mundul).

Description

Inland edge of floodplain, includes a broad flat tog bed, thus gets water from Jubba floods and from run-off into tog. Probably seasonally browsed and grazed.

Soil: Deep; surface grassed, but with silty flakes following recent flood. Weak sub-angular peds break to crumbs and dust. Not sticky, slightly plastic.

Silty loam Color (dry). surface, 10YR 8/4
below, 10YR 5/4

Plant Species On and Around Site

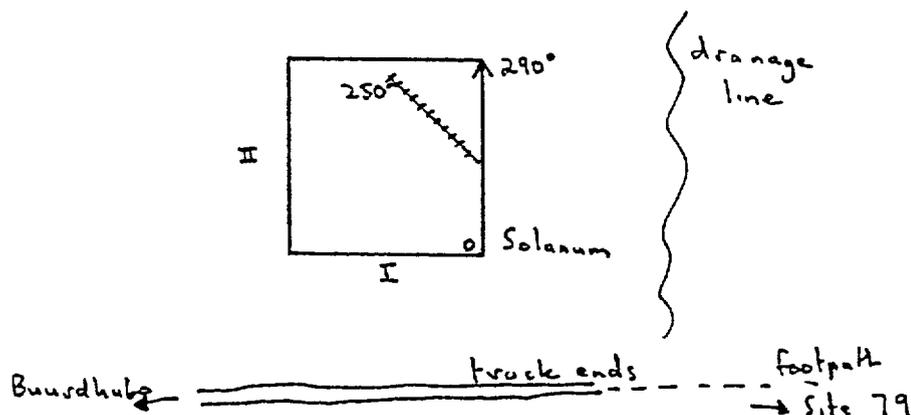
<i>Acacia zanzibarica</i>	4m	dom
<i>A senegal</i>	1 5m	rare
<i>Cordia sinensis</i>	3 5m	occ
<i>Lawsonia inermis</i>	2 2m	occ
<i>Dalbergia sp</i>	4 5m	rare
<i>Celosia polystachia</i>	2m	com
<i>Sporobolus helvolus</i>	0 5m	dom
<i>Cenchrus ciliaris</i>	0 8m	occ
<i>Echinochloa colona</i>	0 6m	sub-dom
<i>Senra incana</i>	0 6m	rare
<i>Solanum sp.</i>	0 3m	com
curcubit	prostrate	occ
<i>Cissus aphylla</i> (climber)	2m	rare
<i>Rhynchosia minima</i>	2m	rare
<i>Indigofera sp</i>	0 6m	occ

SITE NUMBER 78

Location 30km from Garbahaarey on 83°
3°22'N, 42°29'E
Established 16 July 1987

Directions: 0, beginning of road N in Buurdhubo refugee camp;
22.0, concrete buildings in Malka camp; 25 2, fork left up
slope, 25 7, site 78 on left, site 79 c 100 paces further up
footpath (uphill) on left.

Layout. 20 x 20



Markers for relocation hole next to track, 28 4m on 330° to
site

Description

Flat land above current floodplain with little herbaceous
vegetation

Browsed seasonally.

Soil: Deep mixture of old river alluvium and colluvial soil
from upslope. Smooth surface with some silty flakes, and
many very small stones Weak peds crumble to dust and very
small stones. Not sticky, slightly plastic.
Gritty loamy sand Color (dry). 10YR 7/3.

Plant Species On and Around Site

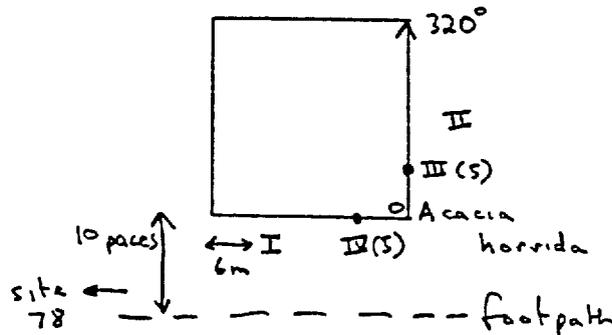
<i>Acacia reficiens</i>	4m	dom
<i>A horrida</i>	1 5m	com
<i>A zanzibarica</i>	6m	occ
<i>Balanites</i> sp	1 8m	rare
<i>Solanum jubae</i>	2m	occ
<i>Dalbergia</i> sp	3 5m	rare
<i>Cordia sinensis</i>	0 4m	rare
<i>Euphorbia cuneata</i>	1 5m	occ
<i>Euphorbia</i> sp	1 5m	rare
<i>Jatropha</i> sp.	2m	rare
<i>Commiphora</i> sp.	0 4m	rare
<i>Adenium globosa</i>	1 2m	rare
unidentified shrub	1 4m	occ
<i>Eragrostis</i> sp.	0 2m	rare
<i>Aloe</i> sp.	2m	rare
<i>Senra incana</i>	0 4m	rare
<i>Farsetia robecchiana</i>	0 4m	com
<i>Ecbolium violaceum</i>	0 4m	occ
<i>Barleria</i> sp. ?ff <i>mucronifolia</i>	0 25m	occ

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SITE NUMBER 79

Location & Directions see site 78
Established 16 July 1987

Layout: 20 x 20



Markers for relocation: rock pile by side of foot track,
7.7m on 295° to site

Description

Moderate slope upslope from site 78 with outcropping limestone and rocks and stones of variable size.
Browsed seasonally

Soil: Shallow and stony with few fines visible at surface
Sub-angular/angular peds are soft, breaking to dust. Non sticky, moderately plastic
Silty clay loam. Color (dry) · 7.5YR 6/8.

Plant Species On and Around Site

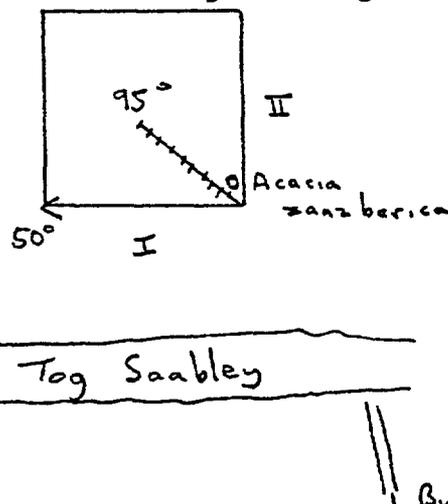
<i>Acacia horrida</i>	1 8m		comm
<i>A reficiens</i>	2 5m		occ
<i>A nubica</i>	1 8m		rare
<i>Boswellia sp. ?</i>		3.5m	com
<i>Solanum jubae</i>	1 9m		occ
<i>Commiphora sp</i>	2m		occ
<i>Euphorbia cuneata</i>	1 8m		occ
<i>Euphorbia sp</i>	1.2m		rare
<i>Balanites sp</i>	2.5m		rare
<i>Anisotes trisulcus</i>	0 6m		occ
<i>Dalbergia sp</i>	1m		occ
<i>Combretum hereroense</i>	2.2m		rare
<i>Dobera glabra</i>	0 3m		rare
<i>Adenium globosa</i>	1.7m		rare
unidentified shrub	1.7m		occ
<i>Tetrapogon cenchriiformis</i>	0 25m		com
<i>Aristida sp.</i>	0 3m		com
<i>Aerva persica</i>	0 4m		occ
<i>Senra incana</i>	1m		rare
<i>Farsetia robecchiana</i>	0 3m		occ
<i>Ecbolium violaceum</i>	0 3m		occ
<i>Indigofera spinosa</i>	0 15m		occ
unidentified plant	0 4m		occ

SITE NUMBER 80

Location. 38km from Garbahaarey on 130°
3°7'N, 42°29'E
Established 17 July 1987

Directions 0, ferry/bridge junction in Buurdhubo camp, turn
S through camp, 5 4, fork left, 6.7, bank of Tog Saabley.

Layout 20 x 20



Markers for relocation hole at end of track on S side of
tog, 178 paces on 180° to second hole on north bank of tog,
from this hole, 21 7m on 120° to site (If in difficulty try
reverse order of bearings as field notes unclear)

Description

On bank of tog with alluvium deposited over limestone
visible in tog bed.

Site floods from tog, but not Jubba.

Heavily grazed, browsed and cut for wood; many cut trees
still lying

Soil ~2m riverine alluvium over limestone bedrock, surface
is largely bare with some silty flakes resulting from drying
after last flood Weak angular peds break to dust. Non
sticky, moderately plastic

Silty clay loam. Color (dry): 7 5YR 5/8.

Plant Species On and Around Site

<i>Acacia zanzibarica</i>	7 8m	dom
<i>A. reficiens</i>	5m	com
<i>Albizia anthelmintica</i>	3 5m	occ
<i>Balanites</i> sp.	2 2m	occ
<i>Grewia tenax</i>	2 3m	com
<i>Cordia sinensis</i>	2 8m	occ
<i>Terminalia</i> sp.	10m	occ
<i>Dalbergia</i> sp	2 5m	occ
<i>Anisotes trisulcus</i>	1m	occ
<i>Solanum</i> 2 spp	1 2/1 5m	occ/com
<i>Eragrostis cilianensis</i>	grazed down	
<i>Brachiaria ramosa</i>	" "	
<i>Tetrapogon tenellus</i>	" "	
<i>Sansevieria</i> sp	0 6m	com
<i>Abutilon anglosomaliae</i>	1 8m	com
<i>Leucas urticifolia</i>	0 25m	com
unidentified Malvaceae	1 5m	rare
<i>Maerua subcordata</i>	0 5m	occ
<i>Maerua</i> sp	0 8m	occ

SITE NUMBER 81

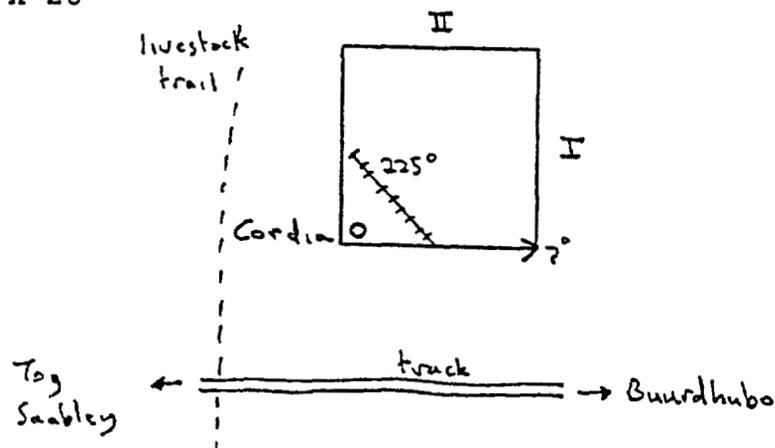
Location: 37km from Garbahaarey on 130°

3°7'N, 42°29'E

Established 17 July 1987

Directions. 0, ferry/bridge junction in Buurdhubo camp, head S, 5.4, fork left, 5 6, stock route crosses track, site is 45 paces right along stock route and to right of stock route

Layout 20 x 20



Markers for relocation hole along track, 40m on 266° to site.

Description

Almost flat level plain above floodplain. Minor undulations probably cause ponding.

Seasonally browsed

Soil Deep, surface is bare with some fine silty flakes

No peds Not sticky or plastic

Silt loam. Color (dry) 7.5YR 6/6.

Plant Species On and Around Site

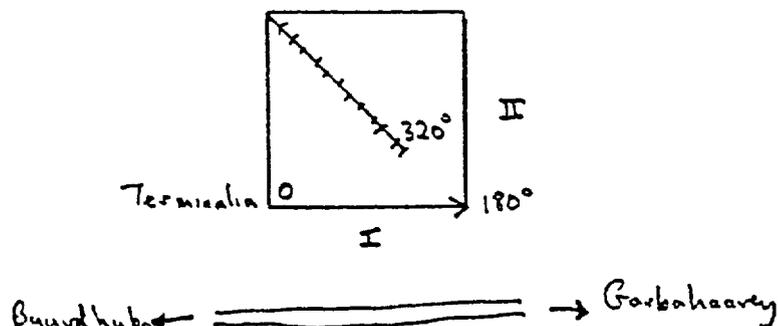
<i>Acacia horrida</i>	1 7m	occ
<i>A reficiens</i>	2 7m	occ
<i>Commiphora</i> sp	4m	com
<i>Cordia sinensis</i>	2m	com
<i>Lannea</i> sp	2 3m	occ
<i>Grewia tenax</i>	1 2m	occ
<i>G. villosa</i>	1 6m	rare
<i>Adenium globosa</i>	2.2m	rare
<i>Euphorbia cuneata</i>	3m	rare
<i>Sericocomopsis</i> ?	0.4m	rare
<i>Asparagus somalensis</i> (climber)	2m	rare
2-3 spp of dry grass including		
<i>Aristida</i> sp	prostrate	
<i>Aloe</i> sp	0 4m	rare
<i>Indigofera</i> 2 spp	0.1m	rare

SITE NUMBER 82

Location: 35km from Garbahaarey on 120°
3°10'N, 42°29'E
Established 17 July 1987

Directions ~60 paces S of a point 150m W of the road N from Buurdhubo refugee camp.

Layout: 10 x 10



Markers for relocation from road by Munduul (where TEBS camped), 49 5m on 194° to site

Description

On edge of Buurdhubo refugee camp, a flat alluvial plain which does not flood Local ponding occurs
High grazing, browsing and wood-cutting pressure, but better vegetated than other refugee camp sites
Soil: Deep, surface has dry grass, silty flakes, soil crumbs and very small stones No peds Not sticky, plastic
Sandy clay loam. Color (dry) 7 5YR 5/8.

Plant Species On and Around Site

<i>Terminalia parvula</i>	4.5m	rare
<i>Acacia mellifera</i>	2m	occ
<i>A. reficiens</i>	0 4m	occ
<i>A. nubica</i>	0 4m	rare
<i>Celosia polystachia</i> ?	0 3m	com
<i>Echinocloa</i> sp	0 4m	dom
<i>Dactyloctenium</i> sp	0.3m	occ
<i>Eragrostis</i> sp	0 15m	com
<i>Aristida</i> sp	dry	occ
<i>Senra incana</i>	0 4m	com
<i>Solanum</i> sp	0 3m	com

other spp probably present but unrecognizable due to grazing pressure

SITE NUMBER 83

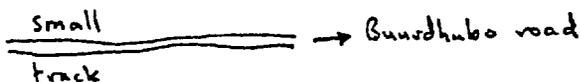
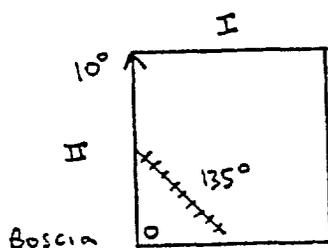
Location 31km from Garbahaarey on 118°

3°12'N, 42°28'E

Established 18 July 1987

Directions 0, beginning of road N from Buurdhubo refugee camp, 5.4, take track on left (direction ~250°), 7.8, site to right of track

Layout 20 x 20



Markers for relocation hole at roadside 14 5m on 330° to site

Description

Slight slope above floodplain, well drained

Good cover of annual grass and relatively little evidence of substantial grazing, browsing or wood cutting

Soil: Deep, smooth surface with a few silty flakes and cracks and some very small stones of limestone and laterite.

Weak angular peds which break to dust. Non sticky, moderately plastic

Sandy loam Color (dry) · 5YR 5/8

Plant Species On and Around Site

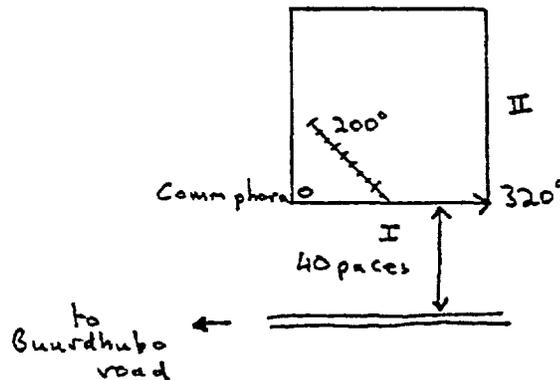
<i>Acacia reficiens</i>	3 5m	dom
<i>A horrida</i>	1 2m	occ
<i>A mellifera</i>	0 7m	occ
<i>Terminalia parvula</i>	4m	occ
<i>Boscia minimifolia</i>	4m	rare
<i>Cordia sinensis</i>	1 7m	occ
<i>Combretum sp</i>	1 2m	occ
<i>Commiphora unilobata</i>	3m	rare
<i>Tetrapogon cenchriformis</i>	0 25m	occ
<i>T tenellus</i>	0 3m	com
<i>Eragrostis cilianensis</i>	0 3m	com
<i>Aristida sp</i>	0 3m	dom
<i>Abutilon anglosomaliae</i>	0 4m	occ
<i>Euphorbia arabica</i>	0 15m	com
<i>Ecbolium violaceum</i>	0 25m	occ
<i>Neuracanthus polyacanthus</i>	0 3m	occ
<i>Duospermum eremophilum</i>	0 25m	com

SITE NUMBER 84

Location: 26km from Garbahaarey on 95°
3°18'N, 42°27'E
Established 18 July 1987

Directions: 0, beginning of road N from Buurdhubo refugee camp, 14 7, turn on track to left (direction ~300°), 16 7, site to left of track.

Layout: 20 x 20



Markers for Relocation: rocks and hole 29 2m on 215° to site.

Description

Gently sloping site on rocky hillside above floodplain
Site seems much altered with predominance of unpalatable species, little herbaceous vegetation and substantial wood cutting

Soil: Shallow; surface mostly stony with some outcrops and a few cracks and flakes between stones. No peds. Non sticky, moderately plastic

Silty clay loam Color (dry): 10YR 6/4.

Plant Species On and Around Site

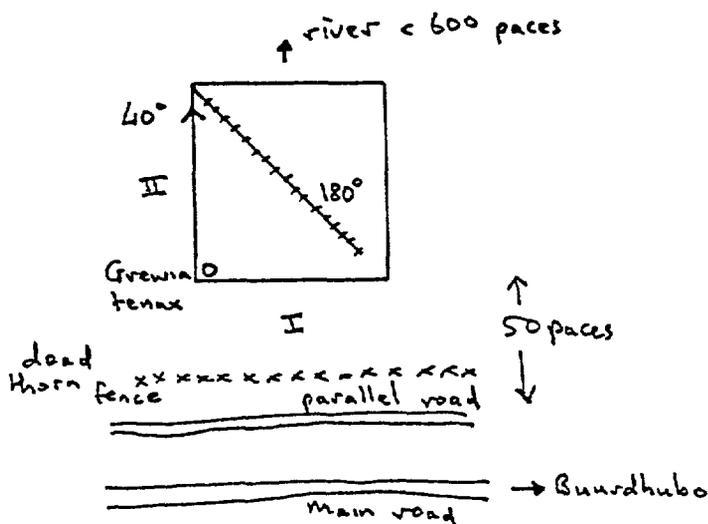
<i>Commiphora</i> sp (spp?)	4m	com
<i>Elaeodendron aquifolium</i>	3m	rare
<i>Euphorbia</i> sp ("stringy")	2m	com
<i>E. cuneata</i>	1 5m	occ
<i>Acacia tortilis</i>	3 5m	com
<i>A. senegal</i>	2 5m	occ
<i>A. horrida</i>	1 2m	com
<i>A. ogadensis</i>	4m	rare
<i>Cordia sinensis</i>	2 5m	com
<i>Solanum jubae</i>	2m	occ
<i>Grewia tenax</i>	1 5m	occ
<i>Terminlia</i> sp.	12m	occ
<i>Boswellia</i> sp.	4.5m	com
<i>Eragrostis cilianensis</i>	0 2m	rare
<i>Aloe</i> sp	0.4m	com
<i>Sansevieria</i> sp.	0 4m	occ
<i>Maerua</i> ?	0 15m	rare
<i>Indigofera coerulea</i>	0 3m	com
<i>I spinosa</i>	0 25m	com

SITE NUMBER 85

Location: 27.5 km from Garbahaarey on 95°
3°18'N, 42°28'E
Established 18 July 1987

Directions: 0, beginning of road N in Buurdhubo refugee camp,
14 0, floodplain enclosure on right of road, site c 25m
inside towards river

Layout 10 x 10



Markers for relocation holes by road, 36.5m on 58° to site.

Description

Level area c 400m from river, partly cultivated at inland edge of floodplain
No current grazing, but used by owner's camels in dry season.

Soil: Deep; surface covered with dense grass, but surface cracks and silty flakes evident following recent flood. Sub-angular peds break readily to crumbs and dust
Moderately sticky, plastic
Clay loam. Color (dry) 10YR 5/4

Plant Species On and Around Site

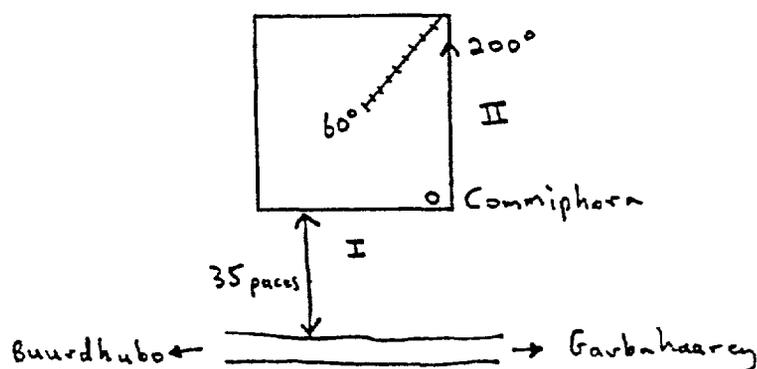
<i>Acacia reficiens</i>	2 5m	com
<i>Cordia sinensis</i>	2m	com
<i>Salvadora persica</i>	4m	rare
<i>Grewia tenax</i>	1 6m	occ
<i>Grewia sp.</i>	0 6m	rare
<i>Sporobolus helvolus</i>	0 6m	dom
<i>Echinochloa colona</i>	0.7m	com
<i>Chloris virgata</i>	0 4m	occ
<i>Cenchrus ciliaris</i>	0 5m	occ
<i>Senra incana</i>	1 2m	occ
<i>Indigofera coerulea</i>	0 2m	occ

SITE NUMBER 86

Location 32km from Garbahaarey on 120°
3°11'N, 42°28'E.
Established 19 July 1987

Directions 2.6km from Buurdhubo camp (marked by junction with road to N) on road to Garbahaarey, site c 35 paces to left of road.

Layout: 20 x 20



Markers for relocation: hole at roadside is 20.5m on 200° to site

Description

Flat sandy plain above the current floodplain.
Seasonally grazed and browsed.

Soil: Deep, surface has dust and crumbs. Soft with no peds.
Non sticky, slightly plastic
Fine sandy loam. Color (dry) 5YR 5/8.

Plant Species On and Around Site

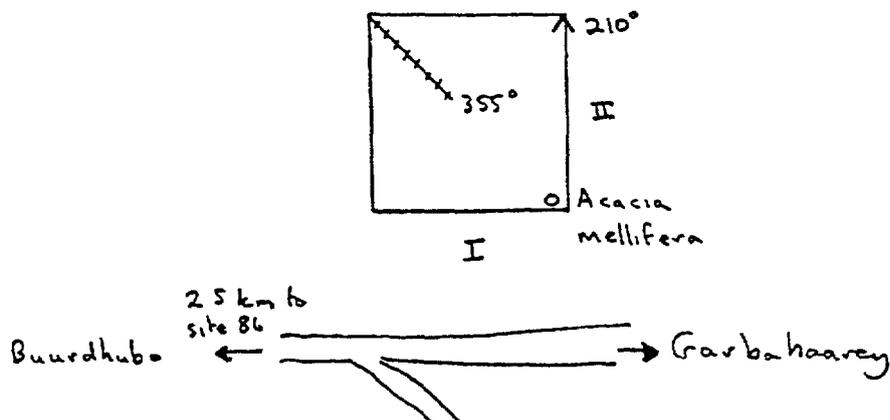
<i>Acacia reficiens</i>	2m	com
<i>A horrida</i>	2m	com
<i>Commiphora</i> spp (2)	4 5m	occ
<i>C unilobata</i>	1 2m	rare
<i>Cordia sinensis</i>	1 7m	occ
<i>Sericocomopsis pallida</i>	0 5m	occ
<i>Eragrostis cilianensis</i>	0 2m	grass spp too dry
<i>Tetrapogon cenchriformis</i>	0 2m	for abundance
<i>T tenellus</i>	0 25m	estimates
<i>Sporobolus</i> sp	0 25m	
unidentified Malvaceae	1m	
<i>Cadaba glandulosa</i>	2m	

SITE NUMBER 87

Location. 30km from Garbahaarey on 120°
3°11'N, 42°27'E
Established 19 July 1987

Directions 5 km from Buurdhuubo refugee campon road to
Garbahaarey (see site 86) on left side of road

Layout 20 x 20



Description

Flat area above floodplain, but rather lush vegetation than surroundings suggests favorable soil water regime
Seasonal browsing probable.

Soil. Deep, surface covered with dry grass and silty flakes
Soft angular peds breaking easily to dust. Non sticky,
moderately plastic
Loam Color (dry). 5YR 5/8.

Plant Species On and Around Site

<i>Acacia reficiens</i>	3.5m	comm
<i>A. horrida</i>	1.6m	com
<i>Caesalpinia erianthera</i>	2.4m	rare
<i>Grewia tenax</i>	1 8m	occ
<i>Cordia sinensis</i>	2m	com
<i>Commiphora</i> sp.	5m	rare
<i>Boscia tomantella</i>	10m	rare
<i>Raphanocarpus stefaninii</i>	1 5m (climber)	rare
<i>Eragrostis cilianensis</i>	20cm	dry
<i>Sporobolus</i> sp	0 25m	dry
<i>Pavonia arabica</i>	0 1m	rare
<i>Heliotropium aegyptiacum</i>	0 2m	occ
<i>Justicia flava</i>	0 15m	occ
<i>Cadaba glandulosa</i>	2m	com
capparid (small leaf)	1m	occ
<i>Barleria orbicularis</i>	0.15m	occ

SITE NUMBER 88

Location. 35km from Garbahaarey on 110°

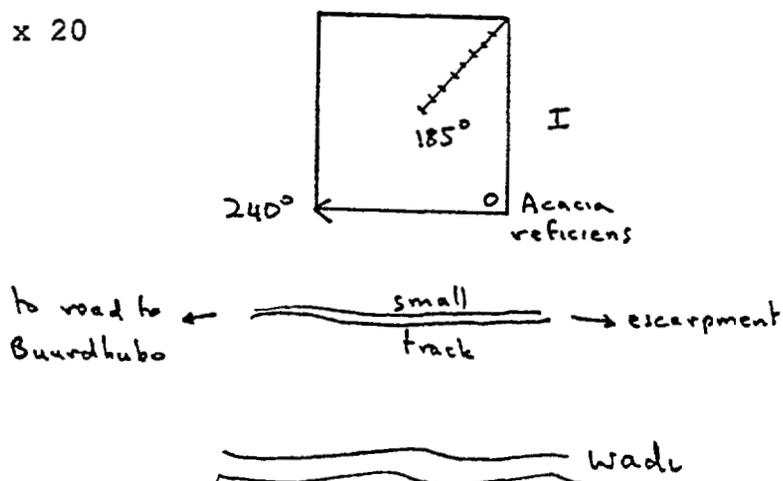
3°14'N, 42°31'E

Established 20 July 1987

Directions 0, junction of Qansaaxdheere road and track running N at edge of floodplain (east bank at Buurdhubo), 5 9, take track to right (direction c 60°); 7 1, site to left of track Area called Hilo Mareer, wadi called Mijilsami.

II

Layout 20 x 20



Markers for relocation hole 31 5m on 350° to site.

Description

Ancient pediplain, above floodplain, formed by scarp retreating to E. Mostly stony surface is slightly incised by small drainage lines and undulates sufficiently to cause some ponding.

Probably browsed seasonally. Substantial wood cutting.

Soil Shallow and stony. No peds. Non sticky, plastic.

Gritty clay loam. Color (dry) 2 5YR 5/8.

Plant Species On and Around Site

<i>Acacia reficiens</i>	2 5m	com
<i>A horrida</i>	1 7m	com
<i>Caesalpinia erianthera</i>	3m	com
<i>Commiphora</i> sp.	2 4m	occ
<i>Sesamothamnus busseanus</i>	4m	occ
<i>Sarcostemma viminalale</i>	2m	occ
<i>Grewia tenax</i>	1.6m	occ
<i>Gardenia florii</i>	0 3m	rare
<i>Terminalia parvula</i>	3.5m	rare
<i>Tetrapogon tenellus</i>	0 2m	grasses too dry for
<i>Sporobolus</i> sp	0 2m	abundance estimates
<i>Aristida</i> sp	0 2m	
<i>Eragrostis cilianensis</i>	0 2m	
<i>Enneapogon schimperianus</i>	0.1m	
<i>Dactyloctenium</i> sp	0.3m	
<i>Euphorbia</i> sp	0.25m	com

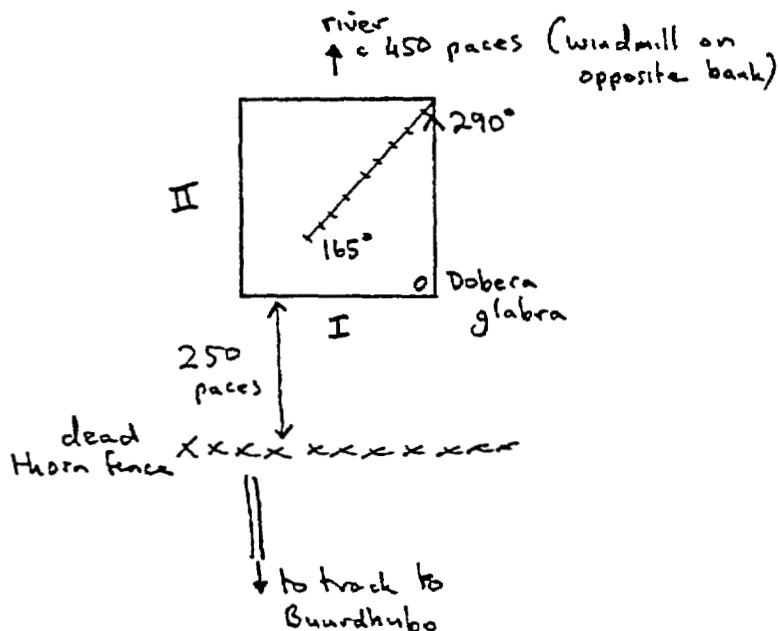
SITE NUMBER 89

Location. 32.5 km from Garbahaarey on 105°
3°15'N, 42°30'E

Established 20 July 1987

Directions 0 same track N as site 88, 8.7, fork left, 9 2,
track ends at enclosed floodplain; site c 200m on river side
of enclosure

Layout: 10 x 10



Markers for relocation hole 200 paces inside enclosure is
46.8m on 286° from site

Description

Part of 0.5km wide floodplain which has an inland edge of *Acacia tortilis* and annual grasses, then a band of *Phyllanthus somalensis*, *A. nubica* and *Ziziphus hamur* shrubs, then a wide stretch of perennial grasses. The site is to the inland edge of the perennial grassland. Flooded in 87. Formerly cultivated as evidenced by small irrigation bunds. Presumably grazed seasonally.

Soil: Deep, surface mostly covered with grass, but exposed parts have a cracked clay surface deposited by the flood. Angular peds break to crumbs and dust. Non sticky, plastic. Silty clay loam. Color (moist) 5YR 4/6.

Plant Species On and Around Site

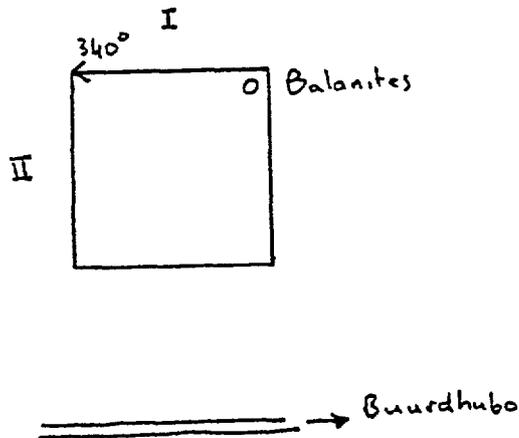
<i>Acacia zanzibarica</i>	0.5m	occ
<i>A. nubica</i>	0 8m	occ
<i>Dobera glabra</i>	6m	rare
<i>Sporobolus helvolus</i>	0 5m	dom
<i>Eragrostis</i> sp	0 3m	occ
<i>Echinochloa colona</i>	0 4m	occ
<i>E haploclada</i>	1m	occ
In nearby areas without irrigation bunds		
<i>Heliotropium aegyptiacum</i>	0.4m	dom
<i>Solanum coagulans</i>	prostrate	com
<i>Leucas nubica</i>	0 15m	com
unidentified Malvaceae	0 4m	com
unidentified curcubit	prostrate	com

SITE NUMBER 90

Location 25km from Garbahaarey on 115°
3°10'N, 42°31'E
Established 20 July 1987

Directions. 0, same track N as site 88; 3.8, turn right (E),
site c 100m from road

Layout. 20 x 20



Markers for relocation. hole next to track, 88.6m on 117° to
site

Description

A gently sloping plain of ancient riverine alluvium above
the present floodplain.

Moderately browsed, lightly grazed and substantial wood
cutting

Soil Deep, surface has fine cracks, silty flakes and very
small stones of limestone, laterite and quartz Soft sub-
angular peds break to crumbs and dust Non sticky, very
slightly plastic.

Fine loamy sand. Color (almost dry) 7.5YR 5/6

Plant Species On and Around Site

<i>Acacia reficiens</i>	3m	com
<i>Balanites</i> sp	4m	com
<i>Commiphora</i> sp	3 5m	com
<i>Caesalpinia erianthera</i>	2 2m	com
<i>Sesamothamnus buseanus</i>	2m	rare
<i>Terminalia</i> sp	7m	rare
capparid	1.6m	rare
<i>Aristida</i> sp.	0 2m	dom

SITE NUMBER 91

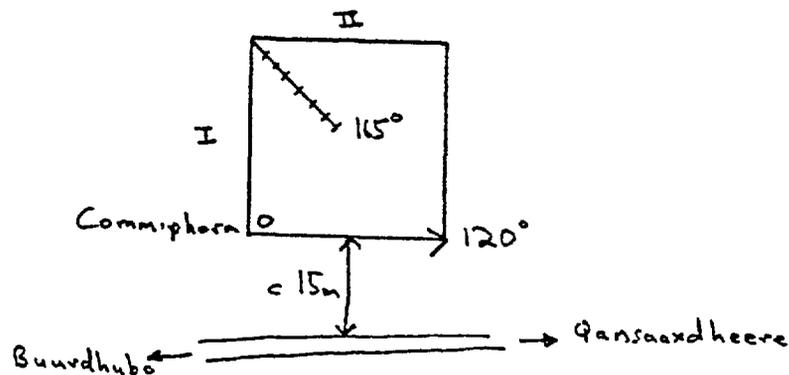
Location 37.5m from Garbhaarey on 120°

3°10'N, 42°31'E

Established 21 July 1987

Directions: 0, same junction as site 88, but take Qansaaxdheere road (E); 1 7 large *Terminalia* on left of road, site beyond and upslope of this tree

Layout 20 x 20



Description

Gentle slope from limestone ridge/plateau down towards river. Stony with some outcrops

Above floodplain

Lightly browsed and little wood cutting

Soil Shallow, surface covered with stones No peds in soil between stones. Non sticky, very slightly plastic.

Silty loam. Color (dry): 10YR 6/4

Plant Species On and Around Site

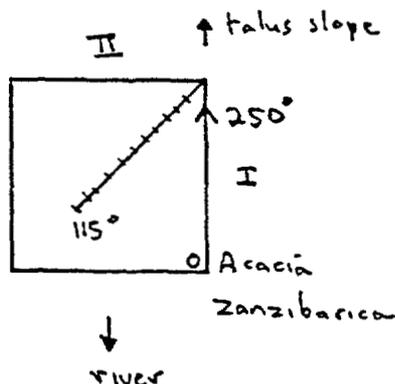
<i>Commiphora</i> spp	3 5m	dom
<i>Euphorbia cuneata</i>	1.7m	com
<i>E. glochidiata</i>	3m	occ
<i>Acacia horrida</i>	2m	occ
<i>Grewia tenax</i>	2m	com
<i>Terminalia</i> sp.	5m	rare
<i>Gardenia florii</i>	1 8m	occ
<i>Jatropha</i> sp	2 2m	occ
<i>Sericocompositis</i> sp. ?	0 3m	occ
<i>Dalbergia</i> sp	2 4m	occ
<i>Combretum hereroense</i>	3.5m	rare
<i>Boscia minimifolia</i>	3m	rare
<i>Cordia sinensis</i>	1 7m	rare
<i>Aristida</i> sp	dry remnants	
<i>Aerva persica</i>	0 4m	occ
<i>Cleome brachycarpa</i>	0 1m	rare
<i>Indigofera spinosa</i>	0.15m	com
<i>Seddera microphylla</i> ?	0.2m	com
<i>Blepharis</i> sp.	0.2m	com

SITE NUMBER 92

Location 52km from Garbahaarey on 135°
3°0'N, 42°33'E
Established 1 December 1987.

Directions: by boat on W side of river, km S of Buurdhubo
bridge Area called Xagar Weyn

Layout. 10 x 10



Markers for relocation: from *Hyphaene* tree on bank 100 paces
on 295° to hole, from hole 10m on 280° to site

Description

Flat floodplain with distinct zones of cut and chopped
Acacia towards the river, then a narrow zone (including
site) of less devastated trees behind which is a band of
Salvadora persica bushes. At the base of the talus slope of
the gorge wall an area of mixed *A. reficiens*, *Grewia tenax*
and *Spirostschys venenifera*.

Flooded in 87

Most of area heavily cut for wood, probably also grazed and
browsed particularly in dry seasons

Soil. Deep, surface has flakes from last flood and plant
litter. Very weak subangular peds break to crumbs and dust
Not sticky or plastic

Sandy loam Color (dry): 7 5YR 4/4

Plant Species On and Around Site

(See also "description")

<i>Acacia zanzibarica</i>	15m	dom
<i>Sporobolus</i> sp	0 25m	com
<i>Setaria</i> sp	0 2m	occ

SITE NUMBER 93

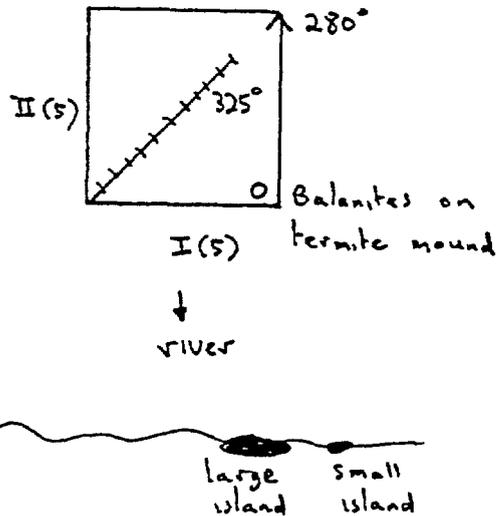
Location: 48km from Garbahaarey on 132°

3°3'N, 42°32'E

Established 1 December 1987

Directions: by boat on W side of river km downstream from Buurdhubo bridge. General area called Gowraar, site called Jiqley

Layout 10 x 10



Markers for relocation: *Hyphaene* tree on bank opposite a small (N) and large (S) island, 74 paces on 290° to hole; 14.6m on 290° from hole to site.

Description

Talus slope at base of gorge just above 87 flood line.

Some grazing browsing and wood cutting.

Soil: Shallow, surface covering of rocks and stones No peds, break down to dust Very slightly sticky, moderately plastic.

Clay loam. Color (dry) 7 5YR 8/6

Plant Species On and Around Site

<i>Balanites</i> sp	5m	occ
<i>Grewia tenax</i>	2m	ab
<i>G. villosa</i>	2.5m	occ
<i>Cordia sinensis</i>	2.5m	com
<i>Acacia reficiens</i>	3m	occ
<i>A. ogadensis</i>	3m	occ
<i>Commiphora</i> sp	4m	occ
<i>Boswellia</i> sp	4m	occ
<i>Thespesia danis</i>	4m	occ
<i>Sericocomopsis</i> sp	1.5m	com
<i>Gardenia fiorii</i>	2m	rare
<i>Blepharispermum fruticosum</i>	3m	occ
<i>Satanocrater paradoxus</i>	1.5m	rare
spindly, spiny acanth	0.5m	com

SITE NUMBER 94

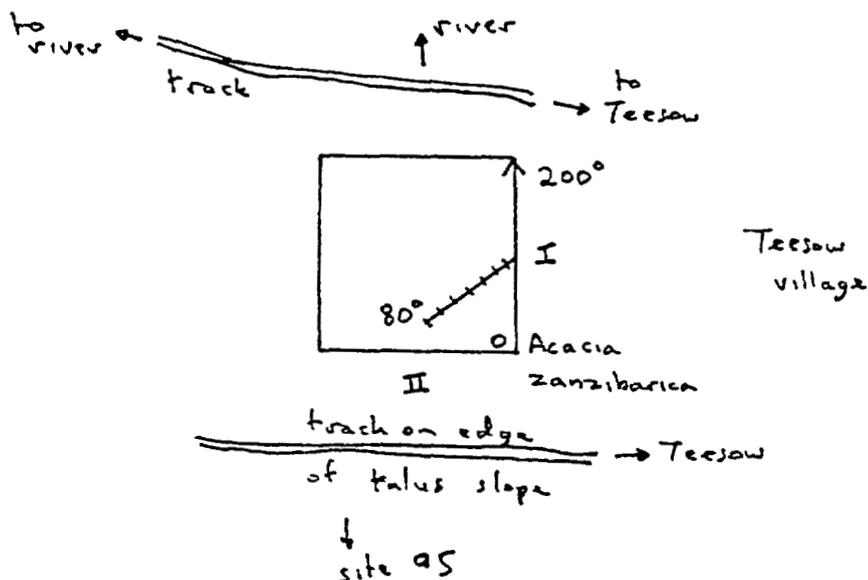
Location: 46km from Garbahaarey on 126°.

3°6'N, 42°34'E

Established 2 December 1987

Directions: by boat on E side of river km S of Buurdhubo ferry. Close to Teesow village (see layout)

Layout 20 x 20



Markers for relocation: 57 paces from Teesow along track at upper edge of floodplain, or 286 paces from river along main track to hole. Hole is 49.7m on 355° from site

Description

Level floodplain towards inland edge, flooded in 87
Heavily grazed and much wood cutting (some felled trees left lying).

Soil Deep; surface smooth with occasional rocks fallen from gorge wall. Subangular peds break to dust. Not sticky or plastic.

Alluvial sandy loam. Color (dry): 10YR 5/4.

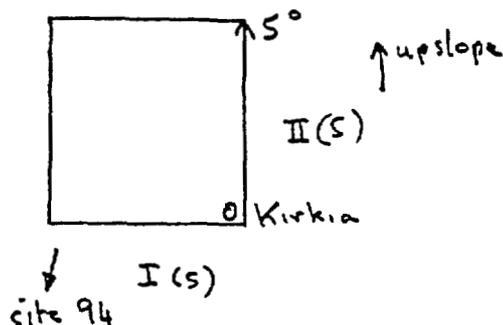
Plant Species On and Around Site

<i>Acacia zanzibarica</i>	20m	dom
<i>Phyllanthus somalensis</i>	2.5m	ab
<i>Elaeodendron aquifolium</i>	0 3m	occ
<i>Cordia sinensis</i>	1 5m	occ
<i>Grewia tenax</i>	1 5m	occ
<i>Hyphaene</i> sp. (?seedlings)	1m	occ
unidentified grass	prostrate	com
<i>Leucas urticifolia</i>	0 1m	com
<i>Solanum</i> sp	0 1m	occ

SITE NUMBER 95

Location & Directions as for site 94.

Layout 10 x 10



Markers for relocation: 31 9m on 22° from site 94

Description

Steep rocky slope of gorge wall.

Never floods.

Probably browsed seasonally

Soil: Shallow, surface of large stones, rocks and outcrops

Subangular peds break to crumbs and dust. Not sticky or plastic

Sandy loam Color (dry) · 10YR 5/4.

Plant Species On and Around Site

<i>Kirkia tenuifolia</i>	4m	com
<i>Acacia horrida</i>	2m	occ
<i>A. zanzibarica</i>	1m	rare
<i>Euphorbia cuneata</i>	3m	com
<i>Commiphora</i> sp.	2m	occ
<i>Anisotes trisulcus</i>	1 5m	occ
<i>Blepharispermum fruticosum</i>	2m	occ
<i>Cordia sinensis</i>	1m	occ
<i>Dalbergia commiphoroides</i>	3 5m	rare
<i>Grewia villosa</i>	1 2m	rare
<i>Hildebrandtia</i> sp ?	1 2m	com