Herlocker

Somali Range Bulletin

A Bulletin of Range Management, Forestry,
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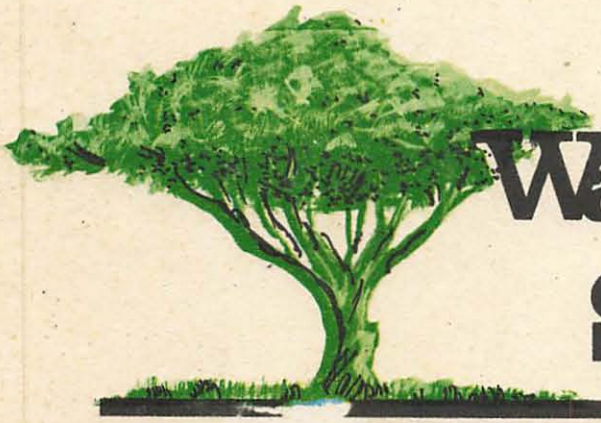

Warsidaha Daaqa Soomaaliyeed

Warsidaha Maareeynta Daaqa, Dhirta,
Ugaarta & Maadooyinka la Xiriira.

NATIONAL RANGE AGENCY
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NO. 16, MAY 1984

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ARTICLES

LETTERS TO THE EDITOR

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Somali Range Bull. No. 16, May 1984

BADBAADI UGAARTA SOOMAALIYEED

Yuusuf Maxamed Axmed*

Mudooyinkaan dambe inta laga bilaabo 1979kii, Ugaarta dalku waxay la kulantay dhibaatooyin aynan muddo fara badan soo marin, waxaadna moodaa haddii sida hadda ay tahay ku sii socoto in muddo gaaban ka dib meelaha qaarkood laga waayi doono neefna, laakiin ay sheekada soo geli doonto in waa' ay ku noolaan jirtay ugaari.

Hadddii aan tafaasiil ka bixiyo aragtidaas, waxaan qofna kadaahnayn dhibaatooyinka ugaarta in ay ka timid dadka farahа badan ee hubabka xad dhaafka ah haysta una laaya hababka hoos ku qoran:

1. Kuwa laaya inta laga ganacsado ilkahooda, iyo hargahooda, ayna ka dambeeyaan dad maalqabeen ah oo badeecaddaas ka iibsada ka dibna dibedda u dhoofiya, iyagoo habab kala gedisan u maraayo.

2. Kuwa ulaaya in ay cunaan hilibkooda inta cidoodka ah, ayna suura gasho in ay mararka qaarkood ku toog bartaan, taas oo dhibaatadeedu ay noqotay mid aad u culus.

3. Dadka beeralayda ah iyo xoola dhaqatada oo ayguna ka laaya meelaha ay daaqsinta iyo biyo cabidda u soo aado, taas oo keentay in ay ka cararaan dhulkii ay ku noolaan lahayd.

Qodobada aan kor ku soo sheegay oo dhan su'aalaha ka imaan kara jawaabtoodu waxay tahay, haddii uusan jirilahayn hubkaas xad-dhaafka ah uu qofkastoo hanaqaad ahi haysato, dhibaatadu intaa way ka yaraan lahayd, maxaa yeelay markii horeba naflaydas duur joogta ah iyo dadweynaha way wada noolaan jireen, mana ay soo gaari jirin dhibtaas farahа badan ee aan korku soo sheegay.

Gobolada ay dhibaatadu sida tooska ah uga soo gaartay waxay yihiin:- Jubada hoose, Jubada dhexe, Shabeelaha hoose, Shabeelaha dhexe, Hiiraan iyo Sanaag. Kuwaas oo ahaa gobolada ay ugaartu ugu tiro badan tahay.

Si kasta iyo xoog kasta oo la saaro, haddii aan dadweynaha iyo dawladduba meel uga soo wada jeensan, ma suura geli doonto in dhibaatooyinkaas ugaarta haysada wax laga qabto, sababtoo ah dadka ay ugaarta duurka kula nooshahay waxaa lagama maarmaan ah in ay fahmaan in ay tahay kayd dhaqaale ah oo dadka u yaal oo loo baxsaan karo markii la doono, dawladda ruuxeedu waa lagam-maarmaan in ay xoogeeda saarto

*Maareeyaha Waaxda Ugaarta ee W.D.Q.

si ay uga mid noqoto wax yaabaha mudnaanta kowaad la siiyo, oo dhaqaale ka imaan karo sida; Beeraha, Xoolaha iyo Kalluunka.

Maqaalkan aan halkan ku qoraayo ma aha mid aan magac hay'ad ama derejo ku aan ku qoraayo, waa mid ii shaqsi ah, waxaana qabaa in mudooyinkaan dambe ay maaamulka hawshaas u xil saaran uusan sidii la doonayey wax uga qaban, maxaa yeelay ilaa iyo hadda badbaada ugaarta waxay ku jirtaa isku tuurtuur iyo isku hallayn, taas oo wax weyn u dhintay wax ka qabadkii la doonayey oo ahayd in loo sameeyo xal horumar ay ku gaarto.

Sida runta ah, si kasta oo laysugu dayo in loo sameeyo mashaariic horumarineed maxba kama xasilayaan haddii aan maarka hore la adkaynin badbaadadeeda , wax mudnaanta hore lehna waxay tahay in marka hore ay xasisho markaa ka dibna looga faa'iideysto daawasho iyo sawirasho.

Waxaan hay'adaha ay arrinta ugaarta khusayso u soo jeedinayaa in sida ay hadda arrintu ku socoto wax laga bedelo, qorshe mideysan oo ay fuliyaanna loo sameeyo. Hay'adahaas oo kal ah. Wasaaradda Xanaanada Xoolaha Dhirta iyo Daaqa, Wasaaradoa Dalxiiska iyo Ciidanka Buuliiska iyo Wakaaladda Daaqa Qaranka.

Waxaan kaloo u soo jeedinayaa dadka jecel ugaarta in ay gacan ka geystaan wax ka qabadka badbaadada ugaarta, taas oo ah in ay hay'adahaas ku caddaadiyaan af iyo acinba wax ka qabadka ugaarta, tabaabushe xoog lehna loo sameeyo

Somali Range Bull. No. 16, May 1984

KHUDBADDII MICHAEL BROWN KA AKHRIYEY SIMINAARKI B/WEYNE*

Michael Brown

Waxaa bedelay:
Abdikarim Hassan Naalaye
Saciid Hassan Maxamed.

Caaqiladda, Odayaasha iyo Jaalayaasha Mashruuca horumarinta Daaqa ee Goboladda Dhexe, dhamaantiinba waad salaamantihiin.

Salaan ka dib, aad baan ugu faraxasanahay in aan idin kala soo qaybgalo shirkan lagu qabanayo B/Weyne, isla markaasna aan kula kulmo saaxibo cusub iyo saaxibo hore.

Anigu dalkan waxaan joogey todoba bilood; waxaana ku dadaalay in aan af Soomaliga barto, waxase laga yaaba in hadalkaygu uu u ekaado, hadalka caruurta. Inkastoo khudbadaydani ay tahay middi ugu horeysay, laakin waxaan rajeynayaa hadalkayga soo socoda in ay noqdan kuwa wanaagsan, oo ka habaan kan hadda. Mashruuca, iyo sida dhinaca dhaqan-dhaqaaluhu uu u caawinikaro dadka reer miyiga ee ku nool Goboladda Hiiraan, Galgaduud iyo Mudug. Mashruuca Horumarinta Daaqa Goboladu Dhexe waxa loogu talagalay in uu u faaiideeyo xooladhaqatada Gobolada Hiiran, Galguduud, iyo Mudug. Waxaana ka mid ah:-

1. In loo hagaajiyo loona habeeyo dhirta ay xooluhu daaqaan xag tiro iyo mid tayaba.

2. In loo kordhiyo ceelasha meelaha ku haboon, daaqsintooduna wanaagsan tahay, ai loo yareeyo waqtiyada iyo xoogga ama awooda badan.

Mashruuca horumarinta daaqa ee Goboladda Dhexe, wuxuu ugu talagalay qalab iyo aqoonyahana horumariya biyaha (warro iyo ceelal), hagaajiya baceadada daryeelidda caafimaadka xoolaha. Sida dadkii iga horeeyay ay idiin sheegeen, haddii la rabo in guul laga gaaro mashruucan, waxay ku xirantahay dadka reer miyigu. Dadka aqoonyahannada ama khubaradu iyo dawladuba midna wax kama qabankaro haddii aydan gacmsiinin.

Idinkama filaayo in aad diidaysaan wax idina faaiido idiinleh am horumar idiinleh. Waxaan ku dadaalaynaa in aan barasho dheerad ah sarno hab dhaqankiina xoolaha si ay u waafaqdo ujeeddooyinka mashruuca. Tanlabaad, mashruuca wuxuu doonayna in uu ururiyo wararka ku saabsan dhirta, taranka xoolaha, nocyada xoolaha iyo go'aanada xoola dhaqatada ay ka

*Khudbadan waxaan ka jediyay magaaladda B/Weyne taariikhdu markay ahayd 26 Sept 1983; Michael Brown.

garaan waqtiga iyo meesha xoolaha la dajiyo, sida badanaaba loo iibiyo xoolaha iyo sababaha loo iibiyo waxaanu rumaysanahay in uu jiro xiriir muhiim ah oo u dhexeeya tirada iyo tayada daaqsinta iyo baaxadda la daajiyo xoolaha kala duwan, ama kala jaad jaad ka ah.

Waxaana kalco u baahanahay warar ku saabsan tirada iyo tayada dhirta, tirada iyo nooca xoolaha iyo siyaabaha loo gado xoolaha iyo hababka loo isticmaalo lacagta laga helo xoolaha, haddii xoolo badan lagado iyo haddi kale. Arrimahan aan soo sheegnay waxaan u barbardhigidoona wararka aan rajeynayno in aan ururino dhammadka mashruucan, kuwaas oo na tusidoona in Mashruucu wax qabtay iyo in kale. Waxaan filaaya in qodobkaasi uusan caddayn, hase ahaatee waxaan doonayna in aan si fiican u sii qeexno. Khaasahan, wararka aan ururino waxaa lagu isticmaala go'aanada mashruuca ee ku saabsan qoditaanka ceelasha, samaynta waraha iyo biyo qabatimada, meelaha ururada xoolaha laga sameeynayo, iyo nooca dadka ay yihiin, iyo meelaha xanaanada xoolaha laga samaynayo. Wararkaas sugan oo dhan waxaa lagu ssameeyaa ama lagu gaaraa go'aano sugan, waxaana qaata ama isticmaala haya'daha mashruucan lacagta siiya. Haya'dahaas oo qiimeeya mashruucan dabadeedna go'aan ka gaara in mashruuca la sii wado iyo inkale, iyo in mashruucaani ku dhamaado sidii looqu talagalay sanadka Kun iyo Sagaal Boqol Sideetan iyo Lixda.

Goboladda dhexe waxaa ka jirta baahi looqabo wararka ku saabsan barashada dhirta, wax soo saarka xoolaha, habka noolasha dadka, iyo dhibaatooyin kala duwan ee dadka xoola-dhaqatada ka haysta degaanada kala duwan. Waxaanu bilaabayna inaanu fahamo dhibaatooyinka guud ee haysta dadka xoola-dhaqatada saddexda Gobol ee Hiiran, Galgaduud iyo Mudug. Hase ahaatee, waxaanu ka ognahay wax yar dhibaatooyinkaas, waxana ka mid ah:-

1. Tirada xoolaha Gobolada dhexe ma kordhayaan, ma yaraanayaan, mise waa meel dhexaad.

2. Degaanada qaarkood tirada xoolaha ma kordhayaan, qaarkoodna ma yaranayaan ama ma meel-dhexaadba, haddi ay haa tahay, waayo?

3. Waa maxay tirada ugu badan ee Xoolaha hayn karta dhul daaqsintiisu caadi tahay roobkeeduna yaryahay, ka hor intaan loogeysan dhibaato daaqsinta iyo dhirtaba?

4. Waa maxay go'aanada qoyska keliyah uu ka gaari karo roobka aan caadiga ahayn. Nooca xoolaha qaabka xoolaha, tirada qoska iyo baahida ay u iibsadaan xoolaha.

5. Waa maxay xiriirka ka dhexeeya dhaqanada reer guuragga, guddiga tuulooyinka oo ay dawladdu magacawday, iyo hawlqabadka dadka reer miyiga?

Sanadkii aanu soo dhaafnay ayaanu wax yar oo su'aalahaas ka

mid ah wax ka qabanay. Aragtidayda, waxay ila tahay in xoog la saroc sidi ay u wada shaqayn lahaayeen, ama isu kaashan lahayeen shaqaalaha Mashruuca iyo xoola-dhaqatada gobolada dhexe si ay u hagaajiyaan ugana jawaabaan su'aalaha aan kor ku soo sheegnay. Haddi aan xoog la saarin wararkaas, way adkaanaysa sida looqiimeeyo sannadada soo socoda in mashruuca u hagaajiyeey nolosha xoola-dhaqatada iyo inkale, inu hagaajiyey daaqsimaha iyo inkale. Taas waxaa lagayaabaa inay dhibaato u gaysato cusboonaysinta mashruuca ama mashruucyo kale. Jaantuuskaani wuxuu ino muujinaya sida lacagtu iyo wararka mashruuca u socodaan.

Deeq bixiyeyaashu waxay lacag siiyaan mashruuca iyo shaqaalihiisa. Shaqaaluhu waxay wararka mashruuca is dhaafsadaan dadka reer miyiga. Iyadoo saldhig ahaan loo qaadanayo wararkaas ayaa mashruuca wax qabadkiisa iagu habeeyaa, dabadeedna sidoo kale ayaa wararku ku laabtaanin deeq bixiyeyaasha, kebacadi waxay gaaraan go'aanka sii kordhinta mashruuca. Haddi ay wararkaas ku qancaana ku waxay si kordhiyaan mashruuca, waxana laga yabaa in ay ku daraan waji labaad. Wararka badan oo wanaagsan oo aan helno waxay keeni karaan in shaqo kale laga sii qabto gobolada dhexe. Haddaba wararka aad ku kaalmeysaan ama siisaan mashruuca, si uu u kordhiyo hawlihiisa, waxaa laga yaabaa muustaqbalka inay dib idinkugu soo laabtaan iyago hab lacageed ah. Laakiin, anigu balan idinka qaadi maayo, waase wax aan rumeysanahay anigu. Khaas ahaan, sii socodka mashruuca wax keeni kara haddi si wanaagsan loo fuliyo qodobadan soosocda:-

1. Iskaashiga wararka fiican oo ay sameeyaan shaqaalaha mashruuca iyo xoola-dhaqatada.

2. In la fahmo habka dadku xoolahu u dhaqadaan iyo sida mashruuca wax uga qaban lahaa dadka reer miyiga, xooloxcoda iyo dhirta degaan kooda. Fikrad ahaan, waxay ila tahay in mashruucani u yahay mashruuc dheer, wada shaqaynteenuna aysiin karto warar hay'adaha deeqda bixya, taas oo keeni karta in mashruuca mar labaad la kordhiyo.

Qaybtayda labaad ee hadalkeygan waxaa weeye masuuliyada aniga iyo lamaanayaashayda, Saciid Shaanle iyo Abdikarin Hassan aan ugu hayno mashruuca oo ah.

1. In aan u sheegno mashruuca iyo hay'addaha deeqda bixiya dhibatooyinka soofoodsaara dadka reer guraaga iyo wixii hakinaaya tirada iyo wax soo sarka xoolahooda.

2. Waa in aan fahmnaa, una sheegna mashruuca, dhaqdhaqaaqa dhaqan-dhaqaale iyo habayntu xoolaha dadka reer miyiga.

3. Markaa aan darisno, xooladhaqataduna wadajir noola shaqayaan wuxuu mashruucu qorshaynayaa wax qabadyo khaas ahaanid, taaso marka yaraynaysa khilaafkii ama dhibaatadi abuurmilahayd.

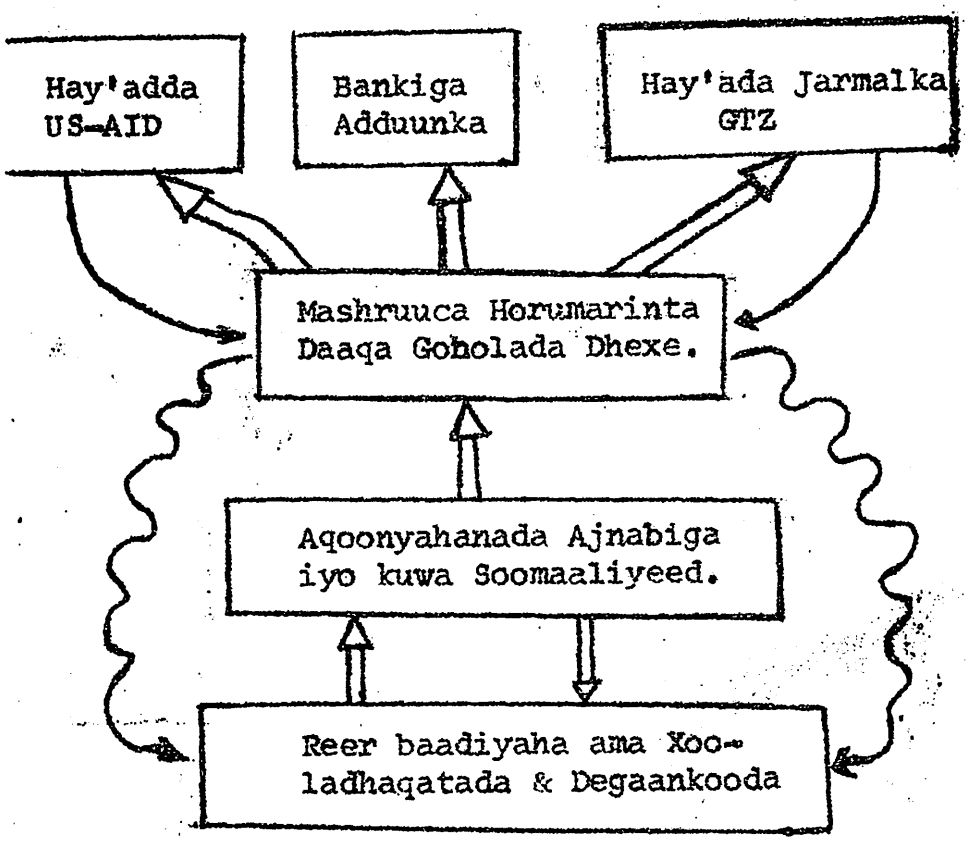

Figure:-

Lacag

Wararka

Waxqabadka

4. Anigoo hordhigidoona dadka go'aanada mashruuca sameeya oo jooga Xamar, meelaha ku haboon in laga sameeyo ceelal, waro, ururada xoolaha iyo seerayaasha.

5. Ka dib marka ay go'aan wada gaaraan xoola-dhaqatadu iyo dadka go'aanka mashruuca u sameeya ayaan gacan ka qaataa wixii laga qabanayo ama laga sameeyoneeyo.

6. In aanu hordhigno una sheegno hay'adaha deeqda bixiya sida ay wax ugu darilahayeen lacagta mashruuca mustaqbalka ama waqtiyada soosocda.

7. In aanu kala shaqayna dadka reermiyiga sidi ay u sameeysan lahaayeen ururo xoolaad una sheegi lahayn shaqadooda, anagoo tixgelinayna ururadoodii hore sidaasna ay shaqooyinkooda.

8. In aan ilaalino guusha ama guuldarada ururada xoolaha kutimaada, iyo sidi ay u hagaajin lahayeen, ulana xiirir lahaayeen bi'adoda iyo dabicadooda, iyo sidi ay kor ugu qaadilahayeen waxsoosaarka xoolahooda.

9. Sidi aan u xaqijinlahayn in xiriir wanaagsan, ka dhexeeye shaqaalaha mashruuca, dadka sare ee go'aanada sameeye, iyo dadka reer miyiga.

Sidaad ogtihiin aniga iyo nimanka lamaaneyaasha ee ila shaqeeya waxaan awoodayada saaraa saddex degmo ee kale ah Buloburti, C/Dheer iyo Hobbio. Suurtagalna ma'aha in aan hal mar wadajoogno saddexda degmo, sidaas darteed haddii ay jiraan wax dhibaatooyin ama fikrado ah ee ku saabsan mashruuca iyo degaankiinaba, anigu hadda, waxaan diyaar u ahay in aan la kulmo qofkii doonaya. Haddii kale waqtiyadda soo socoda waxaad igu dhaafi kartaan farriin shaqaalaha mashruuca oo ay ka mid yihiin maamulayaasha daaqa ee degmooyinka, saraakiisha fiirinta, iwm.

Waxaan doonaya in aan mahad u ceesho dadka xooladhaqatada sida ay iila shaqeeyaan, iina soo dhoweeyaan waqtigan iyo ka horba.

Haddii aan anigu su'aalo badan idin weydiiyo sida u xaaji Cabdulahiga Maxaas igu yiri Mikaahiil Rooble waa su'aalo badan yahay, haddaba waxaan idinka codsanayaa in aad u dul qaadataan su'aalahaas faraha badan ee aan idin weydiiyo, ogsadana in su'aalahaas faraha badani iyo wararkaasi ay idin caawimidoonaan.

Haddii aad wax su'aalo ah haysaan waxaad igu weydiinaysaan af Ingriisi, sida anigu aan hadalkaygan ugu jeegiyay afka Soomaaliga.

Waa salaama alaykum wa raxmat Allah wa barakaatu.

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SOME PRELIMINERY RESULTS OF RANGE ANALYSIS OF EL-DHERE DISTRICT, GALGADUUD REGION.

The Acacia nilotica - Acacia horrida shrubland range site.

Part 2.

Dennis Herlocker*
and
Ahmed Musa Ahmed.**

INTRODUCTION.

This report presents an up date on range analysis for the range site previously named as Acacia nilotica, Dichrostachys cinerea, Solanum incana, Acacia horrida shrubland (Herlocker 1983). It is based on a subsequent survey of the herbaceous and dwarf shrub layer and further analysis of previously collected data from the shrub layer. It emphasizes the causes and subsequent patterns of secondary succession, of the vegetation.

METHODS

Herb layer data was obtained from foliage cover measurments taken along 10 meter point transects; 1000 points per transect. Dwarf shrubs were sampled with 10 square meter circular plots. Species, crown diameter, density and degree of hedging were noted. Both herb layer transects and dwarf shrub plots were coincident with previosly measured 100 square meter circular plots sampling the shrub layer which collected data on shrub height, crown diameter, degree of hedging and vigor. Plots were placed systematically at 5km intervals along road and tracks within the range site. Additional plots were placed near villages to sample continuum changes in vegetation and soils resulting from use by livestock. Time constraints caused few herbaceous transects and dwarfs shrubs plots to be taken than shrub plots.

RESULTS AND DISCUSSIONS.

Seventy-three plant species were measured: 37 shrubs and trees, 6 dwarf shrubs, 9 grasses and 21 forbs. Most were of low importance.

The dwarf shrubs were shown to be an important vegetative

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component of this range site. Indigofera ruspolii, the principal dwarf shrub species, was, infact, dominant plant species, constituting 13.9% of total cover and 72.9% of total density respectively (fig.1). Acacia nilotica, a large shrub, had the highest cover (25% of total). Indigofera ruspolii is not included in the range site name because it is not a dominant species of climax (or near climax) stands.

Perennial grasses dominate the herb layer, constituting 75% of all foliage cover of the herb layer (table 1). The most important are : Aristida kelleri, Leptothrium senegalense, Cenchrus ciliaris, Dactyloctenium aciniticum and the forb Blepharis Sp. Relative cover percentages are 36, 21, 8, 7 and 6% respectively. Annual plants are not important.

Table 1. Vegetative cover.

Component	Cover %	Total %
Shrubs	29.8	75.4
Dwarf shrubs	5.4	13.7
Herbs	4.3	10.9
(Grasses)	1.1	(75)
Forbs	3.2	(25)
Litter	6.8	
(Relative Cover)		
Total ground cover	11.1	
(Herbs and litter)	39.5	
Total living cover	100.0	

VEGETATIONAL RELATIONSHIPS WITH AGRICULTURE

Shrub species composition shows no relationship to distance from permanent water (fig. 2, table 2), but species are associated with one another in a sequence of secondary succession originating with Solanum incanum (a pioneer invader on recently abondoned farms) and ending (apparently) with Acacia nilotica, the largest and propably the longest lived of the shrub species, which dominates climax (or near climax) stands.

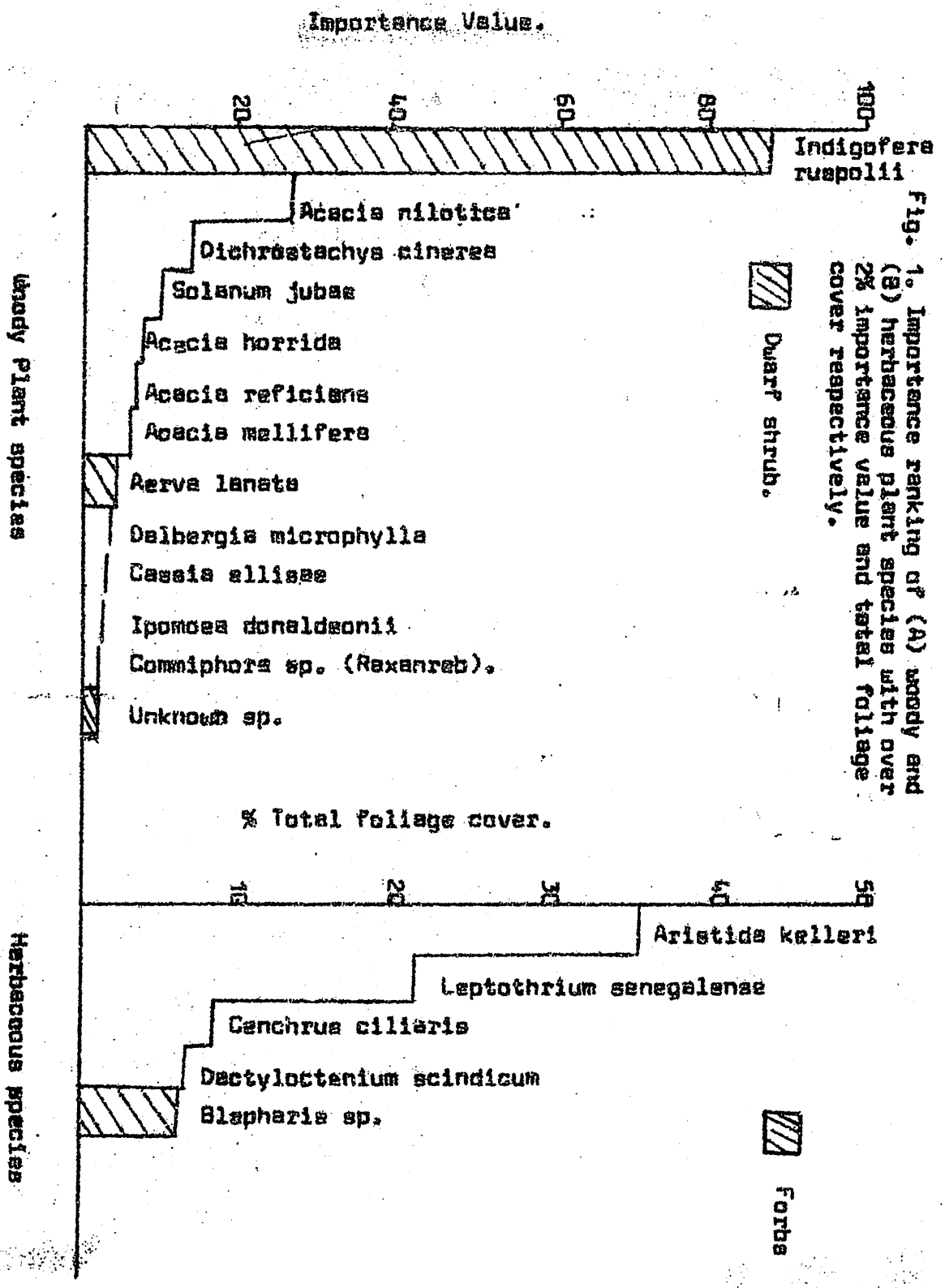


Fig. 1. Importance ranking of (A) woody and (B) herbaceous plant species with over 2% importance value and total foliage cover respectively.

Fig. 2. Occurrence of important shrub species in occular plots. at increasing distance from permanent water.

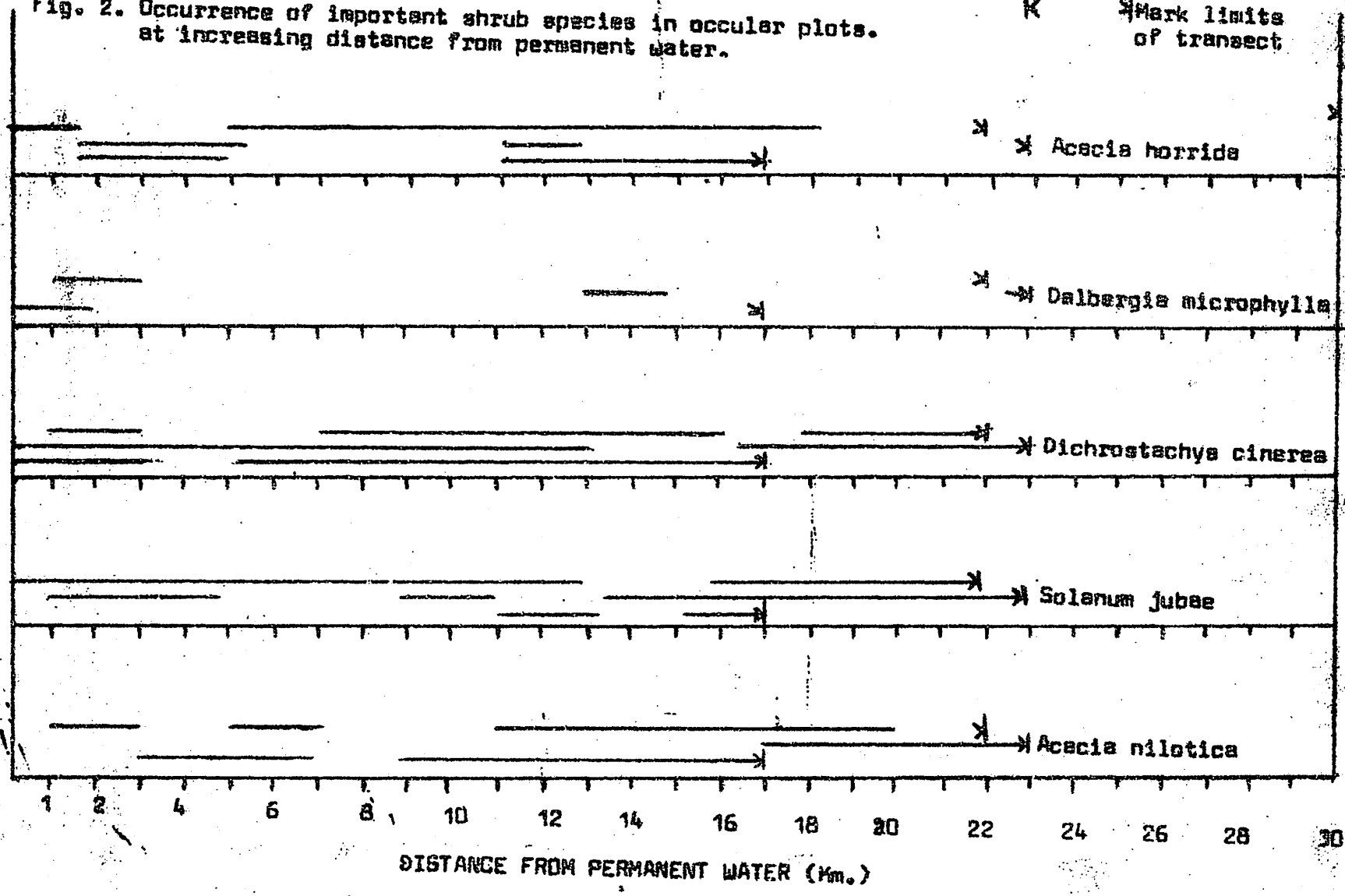


Table 2. Relationship of shrub importance with distance to permanent water.

Distance to permanent water (km)	Relative importance of major shrub				
	Dc	Si	Ah	Dm	An
0.3	6	11	27	-	-
0.7	9	37	13	8	1
2.0	23	-	2	-	-
7.0	19	9	9	40	-
12.0	10	2	17	-	53
15.0	-	-	5	-	-
17.0	43	-	8	-	-
20.0	-	27	5	6	-
25.0	-	27	-	-	-
30.0	27	7	2	-	-

Dc = Dichrostachys cinerea
Sj = Solanum jubae
Ah = Acacia horrida
Dm = Dalbergia microphylla
An = Acacia nilotica

The two end points of successional sequence are often clearly seen in the field. Solanum jubae regenerates abundantly on recently abandoned farms, often dominating them for at last several years. As other shrubs become important, Solanum jubae plants become fewer in number and larger in size. Finally, in stands dominated by large Acacia nilotica and Acacia horrida, Solanum jubae only occurs ocassionally and then as large decadent or dated shrubs in the understory.

The relationships between the shrub species dominating the intermediate stages of secondary succession are more easly shown statically. Matrices of similarity indices show that when all plots in which a species occured were considered, all species were associated to some extent (table 3). Dichrostachys cinerea and Solanum jubae were poorly associated with Acacia nilotica (33% and 39% respectively) and Dalbergia microphylla was highly associated with Solanum jubae (92%). Where only those plots in which importance values were at least 10% were considered (table 4), Dalbergia microphylla and Acacia nilotica and Solanum jubae were poorly related (17%). However, Dalbergia microphylla and Solanum jubae were fairly highly related (67%). Thus, the sequence of secondary succession of shrub species is as follows: Solanum jubae, Dalbergia microphylla, Dichrostachys cinerea, Acacia horrida and Acacia nilotica. However, because

the intermediate stages are not always clearly seen in the field, the sequence is best presented as three stages; pioneer (Solanum), intermediate (Dalbergia/Dichrostachys/Acacia horrida), and climax (Acacia/nilotica/Acacia horrida) (fig 3).

Table 3. Matrix of indices of association between major shrub species based on simple occurance.

	A.n.	A.h.	D.m.	D.c.	S.j. D1
Acacia nilotica (A.n.).	-	47	42	33	39
Acacia horrida (A.h.).	70	-	50	73	50
Dalbergia microphylla (D.m.).	50	40	-	40	61
Dichrostachys cinerea (D.c.).	50	73	50	-	56
Solanum jubae (S.j.).	70	60	92	60	-

D2

D1 = No plots in which species "A" occurs with species "B" / Total no plots in which species "A" occurs ~~xxxx~~.

D2 = No plots in which species "B" occurs with species "A" / ~~xxxx~~ Total no plots in which species "B" occurs.

Table 4. Matrix of indices of association between major shrub species based on minimum occurence of 10%

	A.n.	A.h.	D.m.	D.c.	S.j. D_1
Acacia nilotica (A.n.).	-	33	01	18	8
Acacia horrida (A.h.).	50	-	50	38	31
Dalbergia microphylla (D.m.).	0	33	-	31	31
Dichrostachys cinerea (D.c.).	33	56	67	-	31
Solanum jubae (S.j.).	17	44	67	31	-

D_2

Fig. 3. Stages in secondary succession originating on abandoned farms.

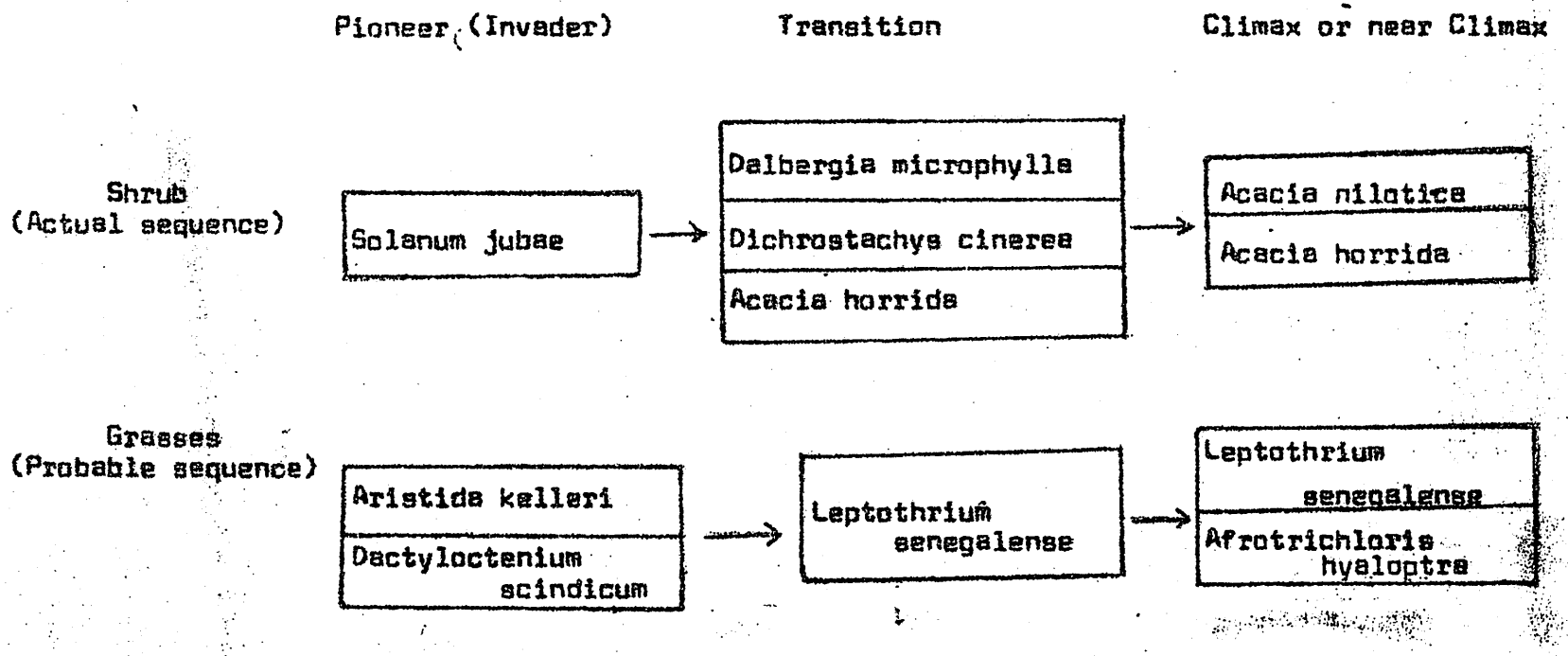


Fig. 4. Population structures of important shrub species.

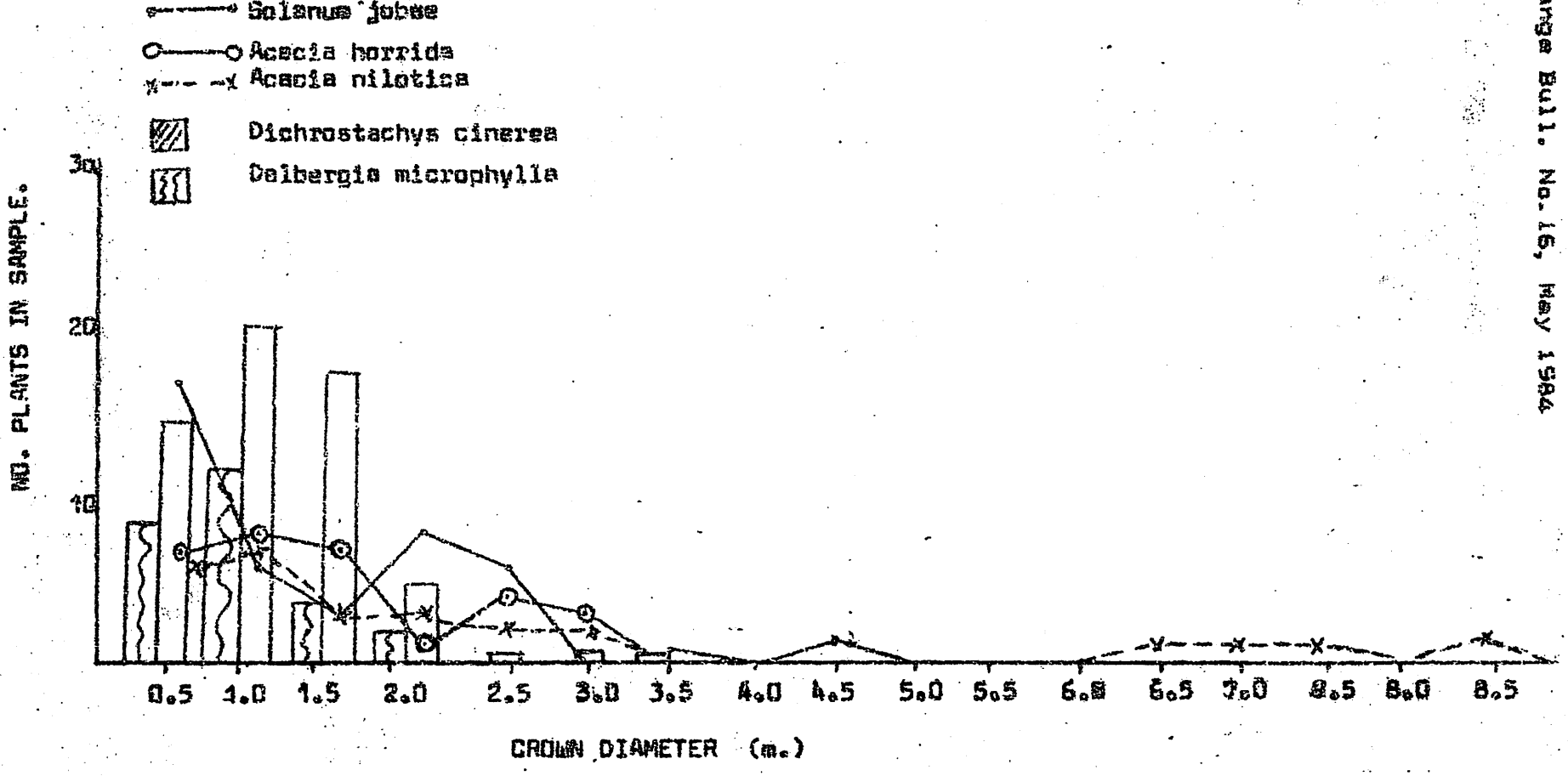


Table 3. Relationship of degree of hedging of shrub palatability and thornness.

Species	Palatability	Thorn	% occurance of moderately or heavily hedged plants.
Balanites	low	yes	100
Unknown species (several)	unknown	no	98
Good waraabe (somali)	unknown	no	96
Hamir (somali)	high	no	96
Dalbergia microphylla	high	no	92
Boscia minimifolia	high	no	89
Huyun (somali)	high	no	92
Heeran (somali)	no concensus	no	78
Sesamium sp.	unknown	no	75
Grewia sp. (chamaq)	medium high	no	67
Indigofera dumosa	medium	no	65
Commiphora sp. (gurey)	high	yes	50
Acacia nilotica	high	yes	45
Acacia edgeworthii	high	yes	37
Acacia mellifera	medium	yes	36
Dichrostachys cinerea	high	yes	36
Acacia horrida	high	yes	32
Commiphora sp.	unknown	yes	30
Euphorbia cuneata	medium	yes	26

Bare areas including incipient sand dunes are colonized by low stoleniferous and rhizomatous mat forming grasses Cynodon dactylon and Dactyloctenium scindicum, but especially former (fig. 7). These species are apparently better adapted to these extreme conditions than forb species. Hence the decrease in abundance of the later close to water. Cenchrus ciliaris is not as important as shown (fig. 6). It occured only once but at a typically highly foliage cover.

Species composition of the dominant grasses is distinctly related to distance from permanent water (fig. 7). Cynodon dactylon and Dactyloctenium scindicum, low stoleniferous mat forming grasses, dominate near water (0-1km) these are respectively palatable and highly palatable invader species. Dactyloctenium scindicum increases in importance from 2-9km from water where it shares dominance with the palatable bunch grass Leptothrium senegalense but decreases in importance thereafter. Leptothrium senegalense which is apparently an increaser species is even of greater importance from 9-18km or so from water where it shares dominance with a perinnial Aristida (probably Aristida kelleri). Aristida kelleri a

That this successional sequence shows no relationship to distance from permanent water indicated that it is little influenced by livestock use. The major influence appears to be shifting cultivation, through shrub clearance, farming and subsequent regrowth of vegetation back towards the climax state. That this influence strong and widespread is shown by the overall importance of the closely associated Solanum jubae within the range site (fig.1), and the healthy stage of its population structure, especially regeneration (fig. 4).

The bimodal population structure of Solanum jubae (fig. 4) could be caused by periodic pulses of regeneration. If so this would likely reflect two phases of farm abandonment with in the range site. As farms are used about 7 years and take about 20 years to recover, the period of time between the two phases could be in the order of 30 years or so.

The absence of middle sized Acacia nilotica trees is propably because these are the largest sizes which are economically feasible to cut down during shrub clearance for farms. Acacia trees which attain such large sizes at maturity may be 100yrs or over in age (Herlocker 1976). Thus when periodic reclearance of land farming is common little Acacia nilotica regrowth probably attains maturity before being cut again.

The impact of livestock of shrubs is shwown by the amount of hedging caused by boowsing. The percentage of shrub plants that are moderately or heavily hedged definitely decreases with distance from water (fig.5). Highly palatable and unarmed or, armed but evergreen shrubs of lower palatablity show the greatest use. Palatable or highly palatable armed shrubs and the least palatable shrubs are used less and least respectively (table 5).

Herbaceous layer attributes show a definite relationship to distance from perminant water, and, therefore, to grazing pressure. Foliage cover % of grasses the dominant component and cover % of litter increase outward away from water. Except for a distinct peak in the 2-9km range, forb, foliage cover % diclines with distance from permanent water (fig. 6). This results from an increase in grazing pressure as the distance to permanent water decreases. Grasses are apparently favored over forbs by grazing resulting in increasing abundance of the latter up to a point.

Immediately adjacent to permanent water, soils and vegetation are highly degraded and livestock impact intense.

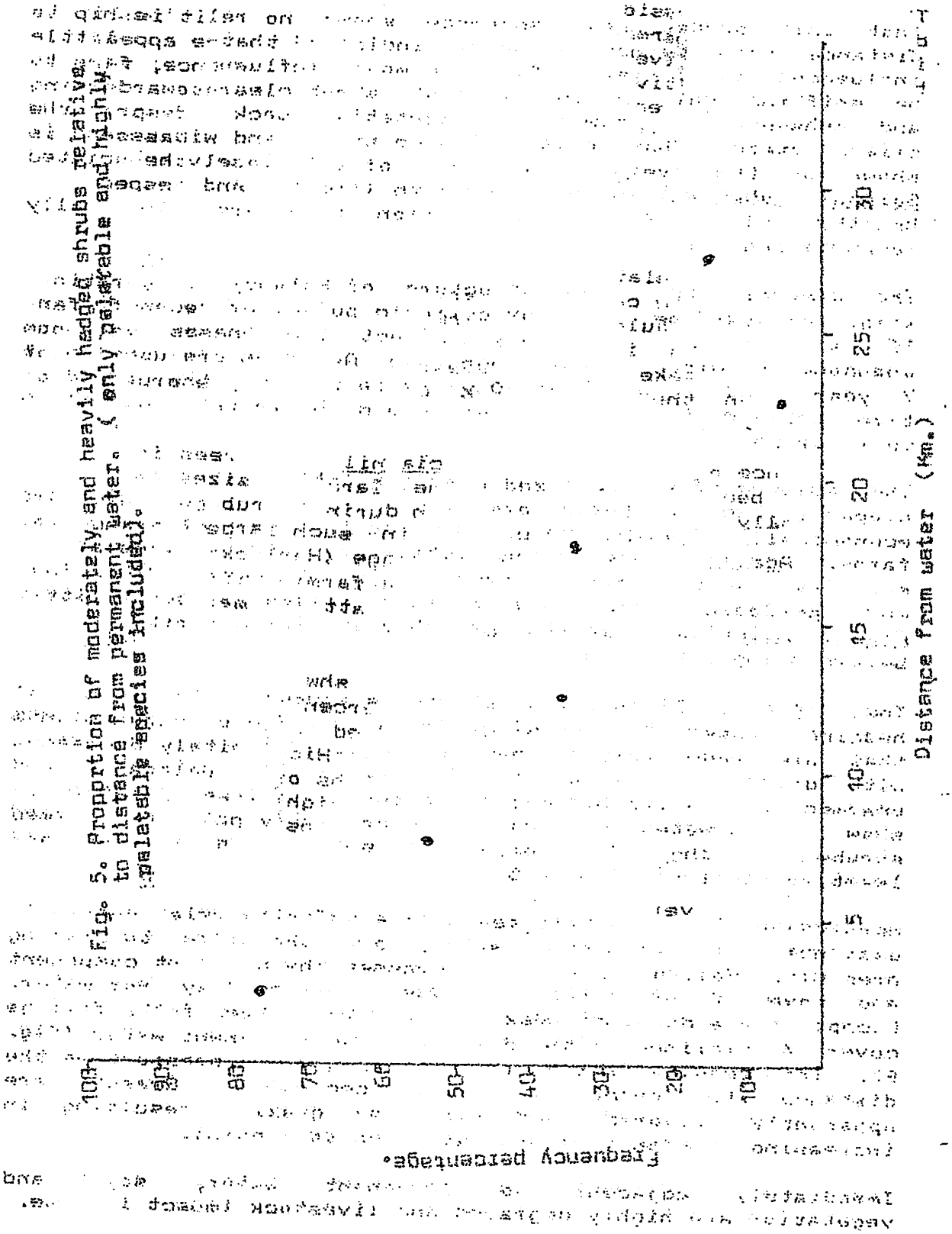


Fig. 5. Proportion of moderately and heavily hedged shrubs relative to distance from permanent water. (Only palatable and highly palatable species included).

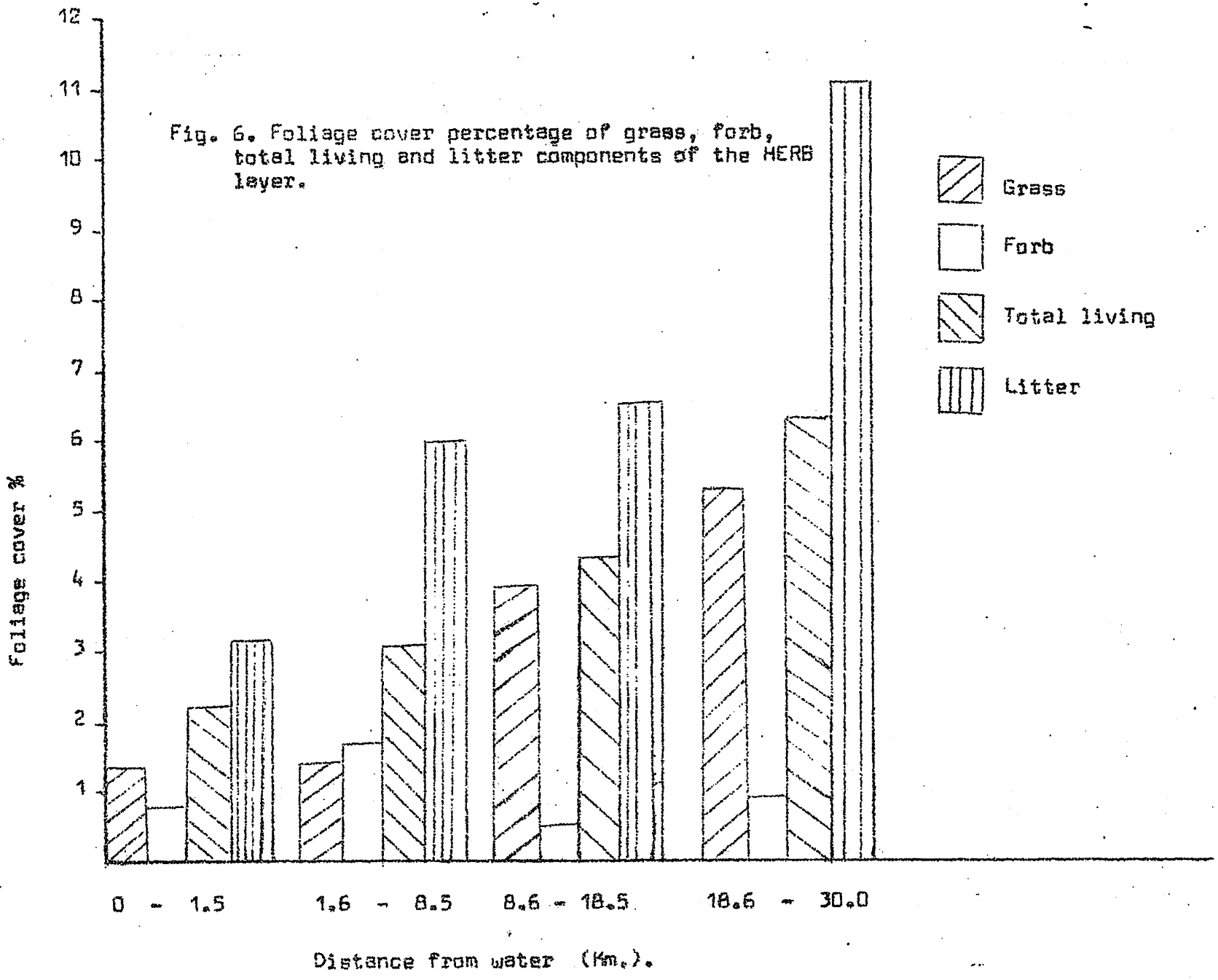


Fig. 6. Foliage cover percentage of grass, forb, total living and litter components of the HERB layer.

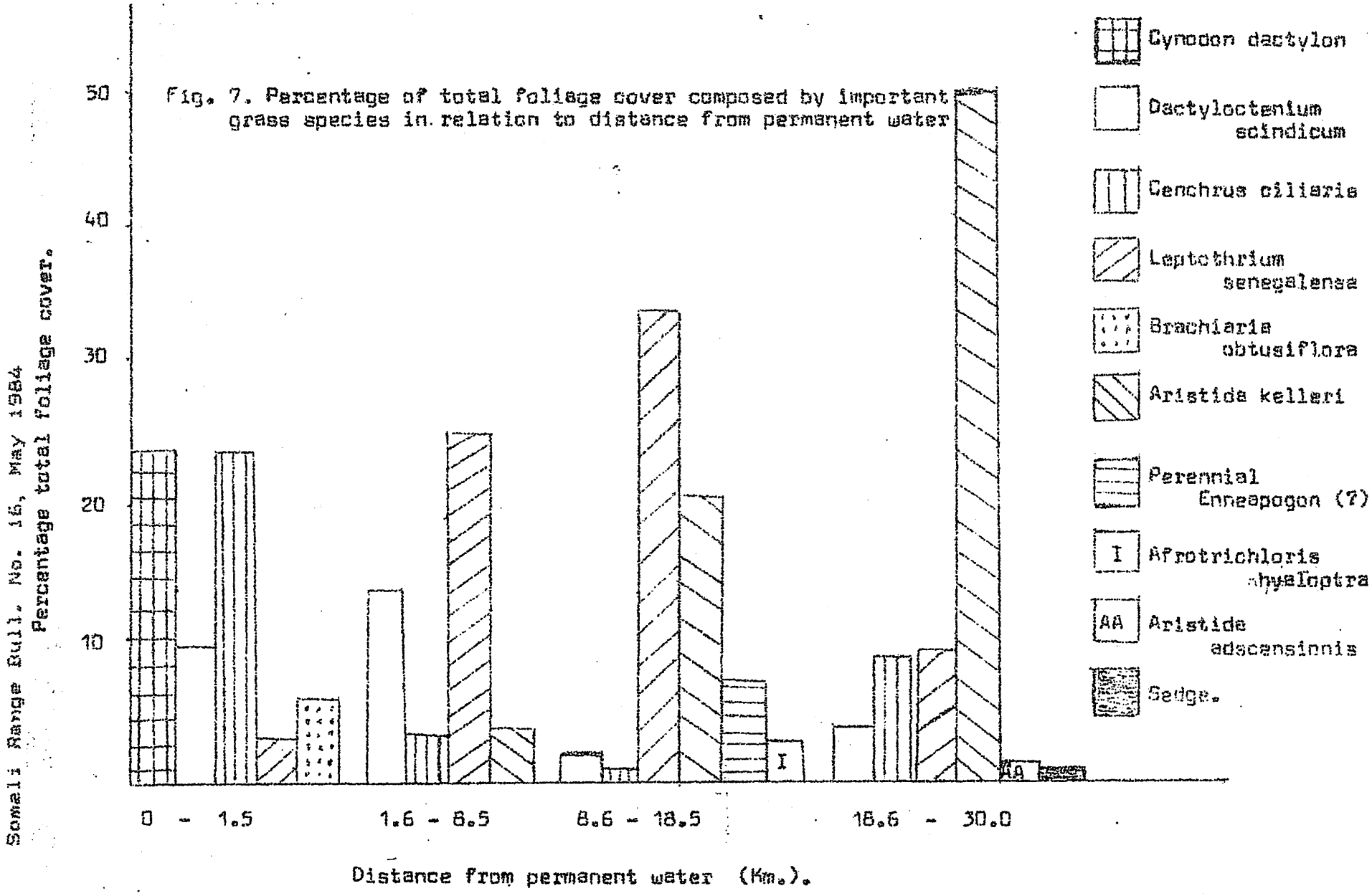
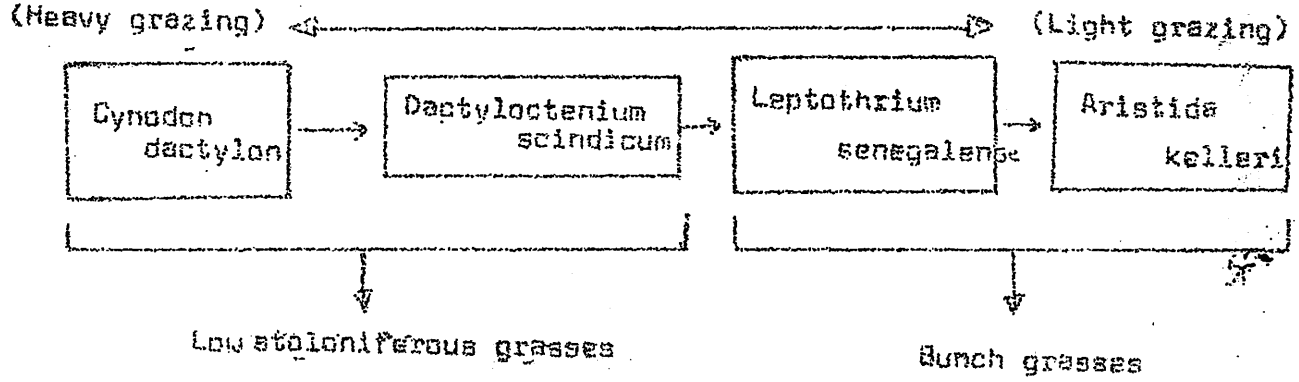


Fig. 7. Percentage of total foliage cover composed by important grass species in relation to distance from permanent water
50
40
30
20
10
Percentage total foliage cover.
0 - 1.5
1.6 - 8.5
8.6 - 18.5
18.6 - 30.0
Distance from permanent water (Km.).
I
AA
Cynodon dactylon
Dactyloctenium scindicum
Cenchrus ciliaris
Leptothrium senegalense
Brachiaria obtusiflora
Aristida kelleri
Perennial Enneapogon (?)
I Afrotrichloris chyaloptra
AA Aristida adscensionis
Sedge.

Fig. 8. Actual successional sequence of dominant grasses influenced by farming and livestock grazing.



perrinial bunch grass, dominates beyond 18km from water (fig. 7). Aristida kelleri, which is of low palatablity is an anomaly here in that it dominates layer of climax or near climax stands where grazing pressures are relatively light and more palatable grasses would be expected to dominate instead. Lepothrium senegalense and a large bunch grass species Afrotrichloris hyalotera are two such species. Instead Aristida kelleri apparently acts as a decreaser becoming less important with nearness to permenant water (fig. 7). This anomaly probably reflects a combination of agricultural and livestock use impacts.

Most of grass species occurced most often on areas that were obviously abandoned farms (table 6). This pattern would probably be even clearer if all farms abandoned during the last decade were easily identifiable as such. Thus, importance of grasses is increased - at last for a few years - by farm abandonment. Aristida kelleri, which is low palatability would probably be unimportant on unfarmed and highly grazed areas but acts as a pioneer on the bare soils abandoned farms. Once established, its importance is probably increased over that of palatable species by concertrated grazing of fallow and newly abandoned farms as is often the practice of this range site. Farming appears widespread throughout the range site. Therefore, suitable conditions for establishment of Aristida kelleri are also widespread.

Although generally of low palatability Aristida kelleri is grazed when young and apparently is not highly resistent to grazing when this occurs. Thus, as grazing intensifies near water this species is gradually eliminated and more grazing resistant and, in this case, palatable grasses take over.

Table 6. Comparison of occurance as dominants of important grass spec. on sites once obviously farmed and those not so.

Species	Frequency % of occurance as A dominant		
	Obviously old Farms (n=12)	Not obviously so (n=45)	Difference
Per. Aristida (A.kelleri)	42	24	+18
Cenchrus ciliaris	33	9	+24
Leptothrium senegalense	17	9	+10
Dactyloctenium scindicum	8	16	-8
Other Aristida species	8	2	+6

CONCLUSIONS

Secondary succession in this range site is controlled by both livestock husbandary and agricultural practices. Farming is widespread within the range site is not dependant upon close proximity to water, and influences the subsequent composition of both herbaceous and woody plant regrowth. Use by livestock, however, clearly decreases in intensity as distances from perminant water increases and, primarily compositionally influences only the herb layer.

Thus, there are the two sub-patterns of secondary succession. That influenced by farming originates with pioneer species on abandoned farms and - at least in the case of the shrub - continues on until climax is reached or land is cleared once more for farms (fig. 3). However a combination of agricultural (in the early stages) and subsequent livestock impact keep the herb layer in a sub-climax condition (fig.8).

Only that area of range site within about 9km from permanant water is in poor condition. This is primarily due to livestock and is expressed in degraded
sandy soils near villages, heavily hedged shrubs and dominance of low stoloniferous mat farming grasses. Most of the range site, however, is in fair condition principally because of abundant shrub and grass species of low palatablity which have originated on soandoned farms. Therefore, range improvement of the two different areas required different approaches. The poor condition areas is probably improvable by a form of rotational grazing system in which blocks of land are periodically rested from grazing. Improvement of the fair condition area will probably have to concentrate on protecting fallow and recently abandoned farms from grazing as part of long term range extension effort directed at the individual farmer/pastoralist.

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Somali Range Bull. No.16, May 1984

CHEMICAL ANALYSIS OF TEN IMPORTANT LOCAL FORAGE SPECIES "HERBACEOUS".*

Ali Yusuf Dirie
Mohamed Mohamoud Farah.

INTRODUCTION

In somalia very little information exsists on the nutritive value of forage plants. Forages are premarily for livestock nutrition and one of the major objective of range management is production of wild or domestic animals. The effeciency of animal production is closely related to the nutrient value of forage available to the animals.

The chemical analysis of forage is only a close approximation of nutrient content because some plant parts are indigestable to livestock. But an analysis can serve as a guide to a what may be lacking or excessive in an animals diet and corrections can be made.

Plant growth and nutritional value of forage plants are influenced by climatic factors: Precipitation, Temperature, Light intensity, Mineral content, Compitition among other plants, etc. The evaluation of plant chemical composition is complicated by the above influences.

This study will evaluate the nutrient content of ten herbaceous forage plants that are found in the diets of cattle at the Artificial Insemination Center and October 21st Dairy farm near Afgoi.

PROCEDURES AND METHODS

The plants selected for analysis were:

1. Cenchrus ciliaris (Perennial grass)
2. Dactyloctenium aegyptium (Annual grass)
3. Aristida funiculata "
4. Leptothrium senegalense (Short-lived perennial grass)
5. Digitaria scalarum " "

6. Cyperus esiculensus (Annual sedge)
7. Crotolaria commenatiana (Small forb)
8. Glycina javanica " "
9. Commolina forskalii " "
10. Clitoria ternata " "

*Thesis project conducted by the Dept. Bot. & Range Management, Faculty of Agriculture, Somali National University.

CHEMICAL COMPOSITION OF FORAGE SPECIES

Proximate analysis-Data referred on dry matter basis-Percentage.

	Dry matter	Crude protein	Ether extract	Crude fibre	N-free extr.	Ash	Lignin	Digest-bility	FU/kg
GRAMINAE									
Cenchrus ciliaris									
24/10/82	26.25	17.25	3.65	28.00	40.00	11.10	4.85	61.6	0.69
18/11/82	22.15	17.40	3.00	31.10	37.80	10.70	7.05	54.9	0.57
4/12/82	24.70	10.10	2.45	36.00	41.80	9.65	8.55	50.4	0.49
21/12/82	27.10	7.65	1.75	41.25	42.25	7.00	14.50	32.4	0.17
Aristida funiculata									
18/11/82	25.35	8.70	1.90	36.10	42.60	10.70	7.95	52.2	0.52
4/12/82	27.05	7.60	2.80	37.05	43.30	10.25	7.10	54.8	0.57
21/12/82	26.35	6.50	1.60	37.80	44.20	9.90	8.90	49.3	0.47
Dactyloctenium aegyptium									
18/11/82	22.65	11.00	2.20	34.30	43.25	9.25	7.15	54.6	0.57
4/12/82	23.40	11.35	2.00	32.25	39.10	15.30	6.40	56.9	0.61
21/12/82	25.75	8.60	1.55	33.90	41.20	14.75	8.60	50.2	0.49
Leptothrium senegalenses									
24/10/82	26.35	16.00	2.95	33.25	41.00	6.80	6.70	56.0	0.59
18/11/82	26.60	10.70	1.90	37.30	41.70	8.40	10.50	44.5	0.38
4/12/82	26.95	10.10	2.00	39.30	41.50	7.10	9.75	46.8	0.43
21/12/82	25.75	9.70	2.15	37.15	43.55	7.45	10.05	45.8	0.41
Digitaria scalarum									
24/10/82	25.55	15.65	4.25	28.70	40.20	11.20	3.85	64.6	0.75
18/11/82	24.05	10.90	3.60	32.35	44.55	08.60	5.20	60.5	0.68
4/12/82	26.55	8.80	3.30	34.80	43.75	09.35	6.95	55.2	0.58
21/12/82	26.60	8.05	2.60	39.00	39.65	10.50	9.75	46.8	0.43

LEGUMINOSAE

Clitoria ternata									
18/11/82	20.45	18.55	2.90	27.05	38.85	12.65	8.80	56.0	0.59
4/12/82	19.95	19.50	3.35	28.30	38.05	10.80	8.80	56.0	0.59
21/12/82	25.80	20.30	2.85	32.05	35.60	9.20	9.20	55.0	0.58
Crotolaria commenatiana									
24/10/82	26.65	24.30	3.15	20.60	35.70	16.25	7.20	42.78	0.67
18/11/82	24.20	21.90	3.10	21.00	36.70	17.30	7.20	42.78	0.67
4/12/82	26.40	19.30	2.75	26.25	35.90	15.80	8.80	56.00	0.59
21/12/82	26.20	16.25	2.45	82.10	33.80	15.40	8.95	56.00	0.58
Glycina javanica									
24/10/82	27.35	19.10	3.15	20.80	47.15	9.80	20.40	-	-
18/11/82	24.10	18.65	1.30	24.25	46.20	9.60	23.15	-	-
4/12/82	27.10	14.45	2.05	29.00	42.60	11.90	22.20	-	-
21/12/82	20.45	15.10	1.60	33.80	42.50	7.00	27.80	-	-
CYPERACEAE									
Cyperus esculentus									
24/10/82	25.25	15.25	3.65	22.35	39.85	14.90	4.55	62.51	0.71
18/11/82	22.90	7.95	2.60	24.55	50.35	14.95	9.30	48.16	0.45
4/12/82	21.00	8.55	3.10	23.10	50.75	14.50	6.55	56.47	0.60
21/12/82	25.87	6.90	2.20	27.35	47.70	15.85	7.95	52.24	0.52
COMMENILACEAE									
Commelina froskalii									
24/10/82	10.20	19.65	3.50	18.80	32.90	25.15	5.25	60.39	0.67
18/11/82	10.05	19.00	2.4	20.20	39.10	19.30	5.30	60.24	0.67
04/12/82	10.20	18.70	3.35	18.40	41.25	18.30	4.00	60.17	0.74

Plants were sampled for the"Deyr" and "Jilaal" seasons, wet and dry respectively. About 300 grams wet weight was taken from the feild to be over-dried at 70 c. All samples were ground through 1mm sq. mesh screens to assist in chemical analysis. This analysis refered to as a proximate analysis includes the fallowing tests: Crute protein, Ether extract, Crute fibre, N-free extract, and Ash. Farther tests were also conducted to determine lignin content, digestibility and the net energy expressed as forage unit (Fu).

RESULTS AND DISCUSSION

As shown in table 1. the dry matter content of all species is relatively constant. Some of the more obvious trends seen are:

1. Protein content decreases with the onset of the dry season and continues.

2. As protein content decreases crude fiber increases with the oncoming dry season.

It is also apparent that the peak period for maximum plant nutritional value is during the rains. Of caurse the inverse is true for the dry season period when lignin content has increased. Lignin is totally undigestible to livestock.

CONCLUSION

The low values of grass crude protein during the dry season are not so low that they are considered bad forage. Apparently these grasses cure very well in the field and are a good source of standing hay. The Artificial Insemination Center cuts and stockpiles this grass. The crude protein content is sufficient to maitain their bulls throughout the dry season.

Somali Range Bull. No. 16, May 1984

EFFECTS OF BRUSH CONTROL OF HERBACEOUS VEGETATION COMPOSITION, COVER AND PRODUCTION.*

Ahmed Abdirahman Hassan
Ahmed H. Aden Mohamed
Mohamed Hassan Aden

INTRODUCTION

Brush invasion and control has been a problem associated with many grazing lands of the world. Early rangeland history provides evidence that large areas now completely dominated by brush were once virgin grassland (Young et al 1948).

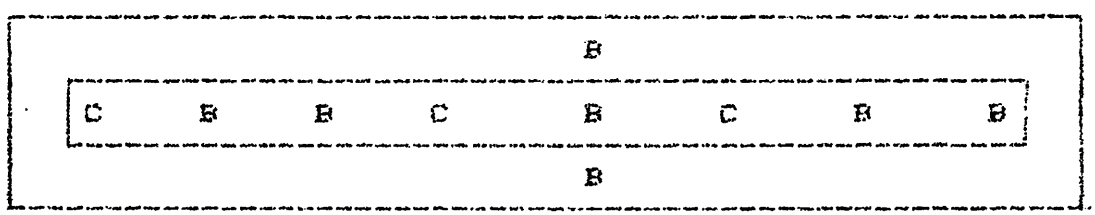
Brush control measures, if properly done are effective means for improving forage production by reducing competition for available water, nutrients and light. In addition to competing with grass many woody species are thorny, so the grass produced under their canopy is inaccessible to grazing animals.

In Somalia most of rangelands have significant brush plant species. Most of these woody species are very important browse species for camels, goats and to some extent sheep. Despite heavy brush occupation of the rangelands, very little information is available on brush control and subsequent influence on herbaceous forage vegetation. Therefore, it is necessary and is the objective of this thesis to conduct a scientific study to observe the effects of brush control on herbaceous vegetation composition and production.

PROCEDURES AND METHOD

Two study sites were chosen. Using a randomized block design each site had three replications of two treatments; cleared and uncleared. (see figure 1).

Fig. 1. Example of study site design.



------ Brush fence

*Thesis project conducted by the Dept. Bot. & Range Management, Faculty of Agriculture, Somali National University.

B Buffer zone of 10m
C Cleared plots 10 X 30m.

The first site called the sandy site was dominated by Acacia horrida while the second site, called the highway site, was dominated by Acacia nilotica and Dichrostachys cinerea.

Sampling took place during the"Dayr" 82, "Jilaal" and "Gu" seasons '83, with randomly selected permanent transects in all plots. Cover was determined using a ten points frame at 5m intervals. For values of dry weight herbage production during the two wet seasons five 5m square quadrats were clipped within each cleared and uncleared plots. Throughout the study precipitation and soil moisture were monitored.

RESULTS AND DESCUSSION

The amount of rainfall was generally the same at each site for the respective wet seasons. There was the expected difference in precip. recieved in the cleared plots versus uncleared plots due to shrub canopy interceptiuon. This resulted in soil moisture differences between cleared and uncleared plots.

The soil moisture content did vary between sites and at soil site depth. Soil moisture increases with depth because moisture near the soil surface is subject to utilization by the plants and evaporation. There was a higher moisture percent at the highway site throughout the course of the study because the field capacity of a clay soil is greater than that of sandy soil.

There was a significant increase in aerial cover and species composition and all cleared plots during this experiment. See table 1. Trends in herbaceous dry weight production were similar to those observed for the above. see table 2.

Commelina forskalea, Ipomea garchiana, Cyperus esculentus, Gisekia pharnacoides, and Leptothrium senegalense were the prevalent species at the sandy site.

Table 1. Percent Herbaceous Cover.

	Dayr		Jilaal		Gu	
	C	unc	C	unc	C	unc
Sandy site	56.3	28.3	33.0	8.2	47.5	20.8
Highway site	24	19	5.9	6.2	14.3	3.6

C = Cleare
unc = uncleared

At the highway site the dominant vegetation included: Clitoria ternata, Glycena javanica, Panicum sp. and Brachiaria reptans.

Table 2. Dry weight production, Kg/ha.

	Deyr		Gu.	
	C	Unc.	C	Unc.
Sandy site	1491.3	605.2	1356.8	635.4
Highway site	1079.1	811.9	621.6	126.1

CONCLUSION

The cover, composition and production of the herbaceous vegetaion increased after brush clearing by reducing competition for available water, nutrients and light. The initial vegetative response from this experiment has been quite impressive. However, the long term effects resprouting of shrub, invasion by undesirable species, etc., cannot be overlooked when the major objective is maximum forage production. At this stage grazing management is important factor in maintaining a sustained yeild of good quality of herbaceous vegetation.

Somali Range Bull. No. 16, May 1984

DEVELOPING RANGE AND LIVESTOCK ASSOCIATIONS TO MANAGE THE SOMALI RANGELANDS.

RICHARD M. HOLT*

INTRODUCTION

The Central Rangelands Development Project (CRDP), encompassing an area of 150,000 sq.km., roughly the middle quarter of Somalia, was initiated in 1981, with the principle objectives being to improve the substainable animal production in the Mudug, Galgaduud and Hiraan Regions. It was conceived and designed in response to the disastrous 1974-75 national drought.

The U.S.$.50 million Project, financed by the World Bank, U.S.AID, World Food Program and the German and Somali Governments, planned to achieve these objectives through an integrated development program involving the;

a) resting and reserving of large areas (range management).

b) surveying, studying and monitoring of the range resource.

c) installation and maintenance of many additional livestock watering points.

d) improvement of veterinary services.

e) rehabilitation of limited areas of the range.

The major project intervention planned to divide up 30% of the rangelands into management units, called 'reserves' then subject these to various forms of grazing management, including rotational, seasonal and famine grazing only. This proposal completely depended on whether the livestock herders within these reserves would;

a) agree to the proposed range management strategies for their grazing land (or some acceptable compromise).

b) form a grazing association for each reserve, the members being all the users of the range resource with the particular reserve, and that these members would elect a committee which they felt represented them.

c) give the grazing committee sufficient support and

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co-operation, for it to implement the range management plan, with technical and physical support from the project and the National Range Agency (N.R.A.).

In 1982 a reappraisal of the range component of the project was adopted, which essentially proposed to eventually develop range reserves and their association for all the rangelands in the project area.

The sociological/educational/economic and husbandry objectives of the project appeared very ambitious. The approximately 500,000 nomadic and semi-nomadic Somali pastoralists in this area are a notoriously proud and independant people. The area is harsh climatically, and particularly isolated and undeveloped with a limited infrastructure. The pastoralists are theoretically free to move their livestock wherever they want. Yet the project proposed within 5 years to organise all these people into grazing associations with elected committees that would be capable of, with the technical assistance of the C.R.D.P., systematically resting, reserving and rehabilitating large area of the rangeland, and managing other interventions such as new water bores.

In addition, there was vertually no data available on the local herding system; the species, numbers and distribution of livestock, herd composition, grazing rational, animal husbandry practises, animal diseases, marketing sociopolitical organisation, number of people, household composition, role and extent of shifting cultivation, privatisation of land, livestock watering systems etc.

PRELIMENARY PROGRESS

The job of assisting to develop range and livestock associations and to undertake associated "community herding distribution" surveys was one of the functions of the Non-formal Education and Training (now called Extention) component of the C.R.D.P. The work began soon after the Range Training Officer and additional Somali Field Extension Officers were recruited in late 1981. They have since been supported by a network of nomadic Pastoral Leaders and recently an expatriate Socio-Economist (Micheal Brown).

The original project design contained no details concerning how the associations would be formed, or what be their structure, function and powers, or their relationship to NRA and the local government. In addition, no details were given and little provision was made for the collection of the non vegetative data needed.

Considerable progress has been made. Following extensive discussions within the project, and with the pastoralists, a series of survey questionaires were designed as a method of obtaining what was perceived as the initial, most basic

information needed to form grazing associations and design a range development management plan. The questionaires are filled out by 9 field Extension Officers, during interviews with pastoralists. A key fact contributing to the success of these surveys has been the use of a local respected pastoralist (Range Elders) to assist the Extension Officers to survey his community. Data is then collected on the name and locality of each pastoralist, and what number and species of livestock he owns usually by interviewing the pastoralists as they water their animals. With the uncertaking of such census type surveys of nomadic pastoral people, it is notoriously difficult to collect and validate data, however, the project ecologists felt it was essential information for grazing associations to function properly, so a first attempt was made to be backed up by further checks and surveys including, if possible, intensive aerial surveys.

Similar methods are being used to undertake at the same time as this census survey, a number of sample surveys, which determine where, when, and why the pastoralists graze their animals throughout the year and map the boundaries of their traditional grazing areas, the "grazing degaans".

Initial results indicated it would in many cases be impossible to institute functional range management plans involving such programs as large scale rotational, seasonal or famine reserves without even a basic knowledge of the different pastoral husbandry and production system in the central regions. For example preliminary studies indicate that under certain circumstances in particular areas, cattle and camels are not herded. They operate under a "Gefer" or free range system. It is thus difficult to control grazing patterns in these areas. Such information is not available in the literature, or from local Somali experts such as Yusuf Abdi Gelle, a Somali Pastoralists and anthropologist who is helping the author and his counterparts with these studies. Similarly, any range management intervention must take into account the extensive movement between grazing degaans, in certain places and times. Example are the Gel Xer, the movement of predominantly dry herds of camels far from the family unit often into other degaans, mainly to seek better feed. This is common in some of the drier areas of the central regions during the two dry seasons, but is not practised in many other areas, or during successful wet seasons. If the jilaal, the main dry season is particularly bad, if labour is available and the size of the herd warrents it, in some areas an analogous Lo Xer, or seperate dry cattle herding system is adopted.

Many other major husbandry and productive strategy variations are comming to light which must be taken into account in developing and implementing proposed range management plans. One of the most important is

agropastoralism. Significant portions of Bula Burti, Ceel Buur, Ceel Dhere, Haradere, Hobyo, Belet Weyne and Jalalaksi districts are cultivated. In the Nooleye degaan, Ceel Dheere district for example, the CRDP area ecologist, Dennis Herlocker's initial vegetation survey suggested the shifting cultivation/clearing practises had probably a greater effect on the vegetation than the livestock, although almost all cultivators have many livestock too. To enable him and the project soil and water conservationist, Bill Fobair to develop an improved range management plan, they thus requested the Extension Section to investigate the ownership, cultivation, fallowing, production and husbandry practises of these pastoral cultivators. Already, initial results are proving very useful, such as the discovery that some agro pastoralists traditionally reseed their fallowed field after cultivating it for 5 to 10 years with buffel grass (Cnencrus ciliaris) and occassionally Acacia species, to provide feed for their animals and to reduce the chance of erosion.

In conjunction with this data collection, other project component investigate the vegetation, hydrology and livestock diseases. Also a series of public meetings and numerous discussions are held with the local pastoralists to discuss their needs, the project aims, and specifically, range and livestock associations. Eventually a public meeting of the livestock owners and range users of a grazing degaan is held to elect an association committee. Committee members also include a representative of the party, and the District Range and Extension Officers.

The general responsibilities of the association, and the committee which is elected to represent it are:

a) To assist in the development of a range management plan for the grazing degaan (reserve).

b) Assist in the implementation of the agreed reserve management plan.

c) Make proposals for the modification and improvement of the reserve management plan as may be necessary.

d) Take an active role in the improvement and development of the reserve in consultation with NRA.

Once the committee is formed, a draft management plan is presented to it. In a series of meetings with the committee, project staff discuss, negotiate and if necessary change the management plan, until it is accepted by the commitee, NRA and the party. This process can take a few months.

To date, two associations, Suguule and Daanle in Hobyo District have accepted management plans and are keeping animals away from grazing areas they have agreed to rest.

Five other associations are formed and are waiting for draft management plans. The most basic data needed to form associations has been collected in many other grazing degaans, and committee could be formed when the project is ready to provide the physical developments inputs as specified in the reserve management plan.

CONCLUSIONS

Initial experience suggests a few conclusions;

a) The pastoralists are generally very receptive to our suggestions and proposals, but at the same time, they are practical pragmatic individualistic pastoral experts. In the reserve management plan they are asked to make considerable sacrifices, especially to not graze (rest) one twentith to one quarter of the degaan. Yet the expected improvement in the condition or (health) and the productivity of the vegetation is a slow process. Significant results would not be expected for five to ten years. To maintain the commitment of the pastoralists for such a long period with little apparent results, it is thus essential to assist the associations with other physical, highly visible development activities which they consider are high priorities. These particularly include; the provision of more watering points (water bores, shallow wells and temporary dugouts), improvement in veterinary care, improvement in livestock and human water distribution system (troughs, shallow well concrete rims etc.), access roads, and food and shelter for specific association members to guard rested areas.

b) The associations will only keep functioning properly if the members percieve that it is useful. This will only happen if the members needs and proposals are always sought and taken into account before any range development and management proposals are instituted in that degaan.

c) The probability that any range management and development proposal will succeed and be substained over a long period is greatly increased if the local pastoralists take an active part in that interventions.

d) Management structures such as grazing associations, and communal range management and development are completely foreign concepts to Somali pastoralists. Thus after associations are formed, there will be a need for many years for project/NRA staff to regularly spend a lot of time and effort supporting them.

The whole concept of range and livestock associations in the CRDP is still evolving. Many critical points about their

function and powers are under discussion. Of great importance is the issue of whether the association should be able to raise money from their members to use for range development and management in their degaan. If so how should the money be collected; by a per livestock levy, rested pasture livestock levy, water use levy etc?. Whether the association have a source of income or not, much of their detailed functional structure and responsibilities need to be defined as experience is gained, a process in which pastoralists should have a major role. To date, each association has elected a committee of 8 to 10 members including a Chairman. It is possible they may decide to elect larger committees in future in some of the more nomadic areas where at times it would be difficult to bring together sufficient committee members for a meeting. The committees have been selecting certain members for specific responsibilities. Thus one man is selected to be particularly responsible for livestock health, another for water development, soil conservation, marketing, guarding reserves etc. Perhaps in future they may decide groups of people (sub committees) are needed for certain of these responsibilies.

Also under discussion is the possible need for a district grazing association committee, with a delegate from each grazing association in the district (8 to 15 per district), the local government and NRA, with the District Commissioner as Chairman. This committee would be responsible for solving any problems that may arise concerning grazing and livestock production between associations. At a district level, it could also take on some of the responsibilities of the local grazing associations.

Whether these grazing associations are successful or not, for the substainable livestock production and quality of life of the Somali pastoralists to be maintained, and hopefully improved significantly, the pastoralists themselves will need to take an active role, and outside contributors will need to develop an understanding of the local pastoral system. The development of grazing associations and the conducting of associated herding system surveys is a first step in this direction.

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NOMADIC STRATEGIES FOR SURVIVAL

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INTRODUCTION

The word nomad is a Greek word which means one who wanders for pasture. This very general statement relates nomadism to movement. But the diversity and complexity of the migrations make this statement a misleading one. Even the nature of the movement, whether it is vertical (Nuer, Somali, Turkana) or horizontal (Masai, Twareg), is varied. The extent of the migrations area also variable, sometimes requiring long distances. Bacon (1950) described nomads as people who dwell the year round in portable dwellings and who practise no agriculture. The nature and complexity of the peoples dwellings and the degree of crop plant cultivation are, thus, important characteristics reflecting both limited material wealth and lack of crop plant production. Fisher (1963) distinguished true nomadism from Transhumance, the former being a movement from one district to another, while the latter is movement in mountainous regions where different levels in the same district are occupied successively. The difference in altitude can bring remarkable difference in both temperature and precipitation; thus, making it a necessity for people and animals to move from areas of unfavourable temperature and low precipitation to those where weather is favourable. For example, in Tibet the severity of the winter snows in higher elevations forces people and animals to retreat to the low-lying areas; they return to the mountains in summer. In northern Somalia, although winter temperatures are not limiting, the summers are extremely hot in the coastal areas. Thus, people and animals move to the plateau in summer and back to the coast in winter.

Apart from the different versions of the term nomadism, there are several characteristics of pastoral nomads which are shared by most of them, or at least by a large part of them. First, pastoral nomads are livestock herders. The species of livestock might sometimes change from time to time and place to place depending upon the availability of pasture and water as well as the historical background of the group involved.

Secondly, nomads move from place to place in search of pasture and water and, sometimes, as a result of temperature changes. This can be a limited local movement (vertical nomadism) of some of the herds and people or annual

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migrations involving whole families or clans. Pasture and water are not the only causes of movement, as other factors are also important. For example, escape from raiding, incidence of disease, poisonous plants, and tribal or family reunions may all cause some sort of movement.

Thirdly, and in fact a major factor facilitating mobility is the communal ownership of land. Thus, although livestock belongs to a family or an indi- vidual, the land belongs to the whole tribe or clan. Communal grazing of the land is a prerequisite to the nomadic migration. If land were individually owned, nomadic movement would cease to exist.

Fourth, nomadic pastoralists accept all kinds of pastoral products unqualified by such reservations as the rejection of milk by lactose intolerant crop growers or the rejection of beef by cow worshipping Indians (Crotty 1980). This, in fact, demonstrates the nomad's heavy dependence on pastoral products as compared to other pastoralists.

Fifth, most pastoralists possess little material wealth. Bacon's (1950 definition of nomads as people who dwell the year round in portable dwellings is a reflection of this characteristic. It is, in fact, logical that some body in a continuous movement should have minimum possessions except the live stock which can move by themselves.

MOBILITY

The first and, in fact, the most important strategy for nomadic survival is mobility. As discussed earlier, the water regime and availability of grazing is very unreliable and changes in both space and time. Thus, in order to cope with the varying nature of the resources, both man and his animals must possess a high degree of mobility. This movement can be either opportunistic (Sahara) or partly cyclical based on season (most other areas). Pastoral economies, introduced into arid Australia (and partly America), become sedentary after a nomadic stage but retain options of motorized nomadism in droughts (Meir 1974).

Johnson (1969) attempted to classify various types of mobility inherent in nomadic pastoralists. He distinguished two types of nomadic movement, horizontal nomadism and vertical nomadism. In the first case, horizontal variations in the seasonal availability of pasture and water are utilized. This is characteristic of nomads who dwell in lowland plains, steppes or plateaus. The Sahellian nomads and Kabbabish of the Sudan are examples. In this situation, marked seasonality movement involves clustering around summer wells during the dry, hot, intensely dessicated portion of the year. The beginning of the rainy season marks the movement of the people and herds to those areas which are too arid to be grazed during the dry season. Two factors are important: the availability of water and the

availability of forage. Water is often limiting, during the dry season, on ranges used for wet season grazing; thus, lack of water makes it impossible for nomads to stay there in the dry season. The wet season grazing area and that of the dry season also might be characterized by two different vegetation types.

The wet season area might be a rangeland where annual grasses are predominant. Thus, with their short life span, grazing is only possible in the rainy season. On the other hand, the dry season area might have a perennial growth of grasses or shrubs, thus making both grazing and browsing possible. A good example of this pattern is found in the Sahel region of west Africa, where changes in both rainfall and vegetation affect the nomadic movements. Here there are two distinctive regions: the northern Sahel and the southern Sahel. The northern Sahel or Sahara Sahel has a very discontinuous vegetation, which is dominated mainly by annuals. The southern Sahel, receiving 400-600 mm of rainfall, has a much taller and denser ground cover in which perennials are predominant. In this case, movement of the nomads to the north during the wet season utilize the annual growth and back to the south during the dry period to take advantage of the perennial growth is necessary.

Vertical nomadism makes use of the altitudinal variations in the seasonal occurrence of pasture and water and is very common in lands with variable topographic features. Temperature also plams a major role in this type of movement. Typical of this is the northern Somali nomadism. In the coastal areas, the major rainy season is around December to January, while in the higher plateaus, the main rainy season begins in May. This offers the possibility of two periods of vegetation growth. Thus, the nomads who have spent the winter period along the coastal areas, migrate to the highland plateaus in May (Lewis 1961).

Whatever the type of movement, the objective is to fully utilize the variable resources. Whether it is the Kabbabish of the Sudan, the Twareg of the Sahel or the Somali of the Horn of Africa, the migrations are based on the utilization of variable resources in different seasons, in different areas and at different times.

LIVESTOCK VARIETY

There is a common tendency to analyze the nomad economy and ecology in terms of the cattle component. Equally important are the other species of livestock, mainly camels, sheep and goats. For example, Swift (1977b) recorded that of Somalia's exports live animals, sheep and goats formed 95% camels formed 2.5% and cattle formed only 2%.

The fact that different livestock species are used has both ecological and economic implications. First, it is a widely

accepted fact that different animal species can utilize different ecological niches much more efficiently than a single species. For example, camels and goats are considered to be browsers, although they might be grazers at certain times. Cattle and sheep are regarded as grazers. Thus, an area containing both grasses and shrubs can best be utilzed by the combination of different animals with different grazing and browsing habits. Apparent digestibility of various dietary constituents by different ruminant species have shown that goats have a better ability for utilizing fodder than either cattle or sheep (Devendra and Burns 1970).

Another advantage of the combination of different species of livestock relates to the water requirement of different species. In arid areas, cattle need water every or every other day. Thus, the grazing distance from a watering place cannot be too long. This is probably the reason why overgrazing is common along water points, where nomads spend the dry season. On the other hand, camels can graze about 80 km from water during the dry season and only need water every five or six days (Lundholm 1976). Williamson and Payne (1978) have also stated that the camel can withstand a very considerable degree of dehydration and in a hot dry environment, camels can tolerate the loss of at least 27% of their body weight. In arid environments, where water is a limiting factor, this characteristic can be a very useful one.

A major advantage of grazing a mixture of livestock species, which is often underestimated, is their population growth rates. Sheep and goats can both have multiple births, although it is less common in sheep. Certain breeds of goats are reported to have about 78% multiple births (Devandra and Burns 1970). Goats can also have two kiddings from a doe per year, depending upon the availability of feed and the management practices. Both sheep and goats can be mature before they are one year old (four to six months). The first kidding can be realized at the age of ten to twelve months. The intervan between kiddings might be less than 240 days. On the other hand, cattle reach maturity at the age of one to four years, depending upon feed availability, while camels reach sexual maturity by the age of five years. However, camels can be milked for eleven to fifteen months, while milking time after calving of indigenous zebu cattle is on the order of six months (Williamson and Payne (1977).

Small stock are also important in terms of meat supply for the nomad family. Brown (1971) has stated that sheep and goats produce 7-9 kg of meat, which can be eaten by a family in a meal, whereas a steer or camel either rots in the humid areas or must be shared with other people or dried and stored difficult under nomadic conditions.

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ANIMALS AS A CAPITAL

Nomads are charged with the notion that they keep large numbers of livestock without any concern to the productivity of the environment. Although there is some truth about this, there are several important adaptive strategies related to the accumulation of large numbers of livestock. Swift (1977a) has argued that large herds are the adaptive response of a subsistence economy to the demands of a difficult and variable environment. In an environment so characterised by frequent droughts and disease outbreaks, a person keeping a hundred head of cattle is in a better position than one who started with fifty head at the beginning of the drought. Crotty (1980, p. 119) described the role of cattle in nomadic societies:

> "Cattle have important advantages as money in a predominantly pastoral society. They are directly useful as sources of milk blood and meat and do not have to be first converted like coins into consumable products, that may not always be available in a vast continent with poor communications and little commerce. Like money in deposit they increase and multiply, at little cost or inconvenience to the owner; but unlike currency, they have an inbuilt hedge against inflation. Perhaps of greatest importance to a people who especially in the past were frequently and necessarily nomadic, cattle are mobile, while other sources of wealth including coins must be transported from place to place, cattle move themselves and can if necessary, transport other forms of wealth also. Cattle for these reasons are an attractive asset for pastoralists to hold. This very attractiveness adds an additional element of a attractiveness to cattle as an asset: it confers on the holder of cattle in a pastoral society security and status, as money in the bank does in sedentary societies".

Thus the presence of large numbers of animals is a hedge against environmental hazards and sometimes an equally uncertain political environment. There are also other uses of cattle (or any other livestock) which serve to strengthen one's status in the community. The borrowing and loaning of livestock is means of gaining friendship, which can be useful in times of need. Equally important is the role livestock plays in the payment of bride prices.

Halland (1977) points out another characteristic of livestock which makes this investment more attractice than other forms of enterprise: the fact that ivestment in cattle is possible without benefit of any economic institution, since one of the main products of the herd is lambs, calves, etc. In this sense the production of calves in an increase

in the capital stock of the owner.

Brown (1971) attributes the nomad's large number of stock to the subsistance needs of the nomad and his family. Assuming that the main diet of the nomad family is milk and taking the average nomad family to be 6.5 adult equivalents, the daily calorie requirement of the family and the herd which can supply this requirement can be computed. Using the standard scale, the calorie requirement of an adult is 2500 a day. For a family of 6.5 adults, this would be 14,950 calories. These calorie requirements of the family can be obtained from 21 lkitres of pure milk; 3/4 milk, 1/4 meat, i.e., 16 liters of milk and 2.41 kg of meat or 1/2 milk and 1/2 meat, i.e. 10 liters of milk and 4.82 kg of meat. If a good cow produces three liters of milk a day, then seven cows are necessary to supply the required milk diet. Since cows have a lactation period of six months, at least 15 cows are necessary to supply the required milk diet a year. On the other hand, if camels are used with a lactation period of about 18 months, and a lactating camel produces five liters a day, four camels will be needed. Of course the family herd will not consist of the milk cows only, in an environment where deaths due to disease, predation and forage scarcity are common. This means that the family must keep more replacement heifers, at least three to four bulls and a few draft animals. Brown's estimate is that at least 35-40 head of cattle, half of them mature milk cows, must be maintained for the family's survival. If we convert this into standard stock units (ssu) (1 ssu = 1 camel = 2 adult cattle =10 sheep or goats), a family owning 35-40 head of cattle will require 17-20 ssu. If the family owns camels, the number will be less.

The demand of this number of stock from the environent is enormous. If rainfall figures are used to estimate the carrying capacity, at least 750mm annual rainfall, at least 2.3 ha are required per ssu (Brown 1971). In areas receiving less than 100 mm of rainfall annually, the production of more than 50 hectares are needed to support an animal (Gilles 1981). Thus, figures of 30-50 ha are required per family in 750 mm annual rainfall. If rainfall is 100 mm or less, as much as 2000 hectares are required per family for subsistence. However, these figures are averages, and there will be variations according to the season, animal species and the botanical composition of the ranges.

In general, whether it is for immediate subsistence needs or for longterm capital formation, the nomad family will require large numbers of livestock.

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CONCLUSIONS

The image of the nomads as a warrior moving from place to place with his animals, and keeping livestock for the purpose of prestige with neither an ecological nor an economic background for his decisions is a misleading one. The nomads live in an environment where the survival of both animals and plants is constrained by numerous factors. The scarce and the unreliable rainfall is the primary element which conditions and, in fact, is the governing factor of life in nomadic societies. Yet, nomads and their livestock have learned and have adapted numerous strategies to cope with their hostile environment.

Various kinds of mobility are methods of crisis survival as well as ways of exploiting a rangeland poorly endowed with moisture. The keeping of different species of livestock has both biological and social justifications. On the other hand, large numbers of livestock above subsistence is a mechanism of saving and investment.

Various interventions have shown both short-term success and long-term environmental degradation. The developoment of stock water points as well as veterinary services does not seem to solve the environmental problems unless accompanied by a workable range management plan. Such a plan should not consider the fundamental range management principles only, but should also take into account social factors; as Milo Cox said (pers. comm. 1981): "We are not managing rangelands only; we are managing people as well."

Previous livestock developoment projects have tended to address single components of the system without regard to their relationships with other components of the system. Provision of water supplies without regard to the carrying veterinary services and water points without ensuring a regular offtake from herd is another example.

Another problem is that nomadic production systems have been approached in terms of cattle, with little or no regard to the diversity and complexity of the other animal species. Sheep, goats and camels are all utilized. Developers and planners should therefore assign importance to small ruminants and camels as well.

Above all, nomadism makes use of an environment which is hard to manipulate in the light of present technology and social institutions, and its existence contributes much to the provision of an important nutrient-protein. It is, therefore, recommended that existing ways of nomadic land use and animal husbandry be attempted only after an ecological and sociological analysis of the system.

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PRELIMINARY OBSERVATION ON CAMEL MANAGEMENT

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INTRODUCTION

The one humped camel (Camelus Dromedrius), was domesticated in Southern Arabia about 3000 B.C, and introduced to the "Horn of Africa " about 2500-1500 B.c.(Mason, 1979). It has been, since then the most consistantly successful animal in the harsh environment of the "Horn".

Somalia represents a large portion of the Horn of Africa, covering approximately 637,000 sq km, in which about 90% of the area is best suited for grazing of Camels, Sheep, Goat and Cattle (FAO, 1968, IBRD, 1975). Significance of livestock to Somalia is of paramount importance because the welfare of its people depends on livestock. The size of the rangeland, the number of animals which browse-graze on it, the number of people dependent on range livestock and the value of export income from the livestock industry shows that the growth and development of the nation would have been seriously impeded without its natural rangeland resources.

It was estimated that about 60% of the Somalis are totally dependent on livestock production. Another twenty percent obtain part of their support and supplementary income from range livestock industry (FAO, 1968; IBRD,1975). Thus livestock is the principal source of livelihood for more than 80% of the Somali population. Besides this, livestock has always been the mainstay of the subsistence economy of the country. It generates about 2/3 of the nations foreign exchange which enables it to purchase essential products from world markets.

Somalia has more than 5 million Camels and 44% of the Camel population of Africa (Mukasa-Mugerwa, 1981). For Somalis Camels are the precious animals and play significant role in the over-riding importance of Livestock to Somalia. They are used for milk and meat production. Mukasa-Mugerwa (1981) reported that 160,000 Camels are sold for meat every year in which 136,000 are slaughtered for local consumption. In addition to Camels value for food, they are also used for transportation.

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Despite the economic value of Camels, their ability to survive in harsh environment and their tolerance to drought and water stress, little is known to outsiders about their management. This preliminary observation, therefore, deals with the management of Camels with respect to seasonal browsing, grazing and watering. It exclusively reflects results of several field trip to Camel owners and author's personal background experience on Camels.

GRAZING AND WATERING IN DIFFERENT SEASONS OF THE YEAR.

In Somalia the management systems practised by the nomads from generation to generation is dictated by different seasons of the year. Four distinct seasons (two rainy and two dry), in which a wet one is followed by a dry one, occur in the year. Grazing by Camels and watering them greatly depends on the availability of forage and water which is directly related to these different seasons. How the nomads adjust their Camels to the avilability of forage and water is explained in the following pragraphs.

1- "Gu" Season (Spring: April, May and June) is the first major rainy season of the year. In this season the old settlements infested with ticks and tickborn diseases are abandoned and new homes generally made for the Camels. In this fresh new dusty places Camels can get rid of remaining ticks on their body by rubbing themselves against dusty ground ("Galgalin"). As the "Gu" is a calving as well as a breeding season, separate thorn fenced corrals "Xero" are built separately for milking or dry Camels to minimize disturbance to milking Camels and their calves at night. In the day time, however, they browse graze together. Camels are kept to late hours of the morning in their "Xero" so that

   (1) The night dew is evaporated from the green shrubs and grasses otherwise the Camels will not graze but walk fast and far from home in search of dew free pasture thus start grazing late.

   (2) The Camels remain close to camp areas.

   (3) The females could be milked late, especially, when calves spend the night with their mothers.

   (4) To minimize day-long herding difficulties.

   During "Gu" season Camels are seldom watered because the bush green forage provides the amount of water required moreover the rain water accumulated in natural ditches, roads, etc,are available to them. Uncles forage availability becomes scarce, movement of Camels from one place to another is restricted.

2- "Xaga" season (Summer:July, August and part of September) is the first and short dry season in inland areas. It is hot in northern coaste but humid and rainy in the southern coastal areas. Because "Xaga" is windy, therefore, Camels are protected form wind by making new wind-proof "Xero" in new camps or reinforcing the old "Xero" if the camp is not changed. In this season whether the claves stay with their mother or not depends on milk requirement of the owner family.

Maximum efficient utilization of available forage in this dry windy season is obtained by frequent watering of the whole herd. In northern regions, the interval between two consecutive waterings is shorter in "Xaga" season than in the dry "Jilaal" period (see below), because in "Jilaal" forage is even less available than "Xaga". It has been observed that more forage Camels consume in a short time the more water they require. As in "Jilaal" the forage is limited, Camels spend more time in search of food which lengthens the interval between watering periods.

3- "Dayr" season (Fall: part of September, October and November) is the second rainy season. Management of Camels in this season is the same as in the "Gu" rainy season. A new home is built, a separate "Xero" is required for milking and dry herds during the night but they graze browse together during the day. If forage, water and disease problems are limited, camels stay on the same range the following "Jilaal" dry season.

4- "Jilaal" season (Winter: December, January, February and March) is the second longest dry season. It is cold and dry in the north but dry and hot in the south.

Usually in "Jilaal" the Camels stay in the same "Xero" which was built in "Dayr" except the frequent cleaning of dung from the "Xero". The frequency of cleaning varies with Camel population, density, presence of ticks and other diseases. Usually removing of dung once to three times a week minimizes tick infestation and diseases. Unlike the rainy seasons, Camels are released from the "Xero" early in the morning and come back late in the evening to get enough time for grazing/browsing. From a short time observation (few days) in Afgooye district an average of twelve (12) hours per day for browsing/grazing is noted. If sufficient forage is available in the vicinity and water is located at a reasonable distance usually the herd is not divided into milking and dry groups. Not dividing the herd has the advantage of the keeping the family together and save the extra labour for herding the groups of Camels, Sheep and Goats. However, sometimes dividing Camel herd into milking and dry groups becomes indispensible in view of the forage and water availability, time of birth and family need for milk.

When water is plentiful but forage is scarce, the milking Camel herd remains close to water together with small ruminants. The dry herd, however, moves far away from water sites where sufficient forage is available and comes back and forth for watering, usually once every week or once every two weeks. When both water and forage are limiting, the whole Camel herd is moved together with small ruminants. If there is a place where both water and forage are present the Camel herds are not divided. If not then the milking herd is moved close to water locations with small stock, while the dry Camel are herded away from water for better range. The milking herd is watered every 3-7 days . This varies from place to place. In lower Shabelle where river water is available almost throughout the dry season, Camels are watered every 3 days. In the Haud areas (far inland) Camels browse/graze at a distance of one day walk from water sites. In this case both calves and mother Camels go together for watering. They stay one night around water wells and go back to the range. If the calves can not go with their mother, the Camels walk back to their calves at night the same day. Intervals of watering, in this case, are about a week.

Herd division also takes place at time of birth. This happens only when calving time coincides with lack of forage in the present settlement areas and also with the onset of rainfull. Those Camels giving birth remain in site while dry Camels go for better forage areas. This period of seperation is short unless drought occurs which could dictate the milking herd stay with small stock around water sites.

The family requirments for milk also dictate division of camel herds. The need for milk could be for family consumption and/or for cash-selling to nearby villages and towns, thus the milking herd stays close to small stock with in the care of women, children and elders.

SUPPLEMENTAL FEEDING

When forage becomes scarce and there is no other suitable place to move, supplemental feeding is provided to milking Camels by cutting inaccessible Acacia branches, collecting pods or looking for certain types of plants such as the prasitic Loranthus species growing on top of Acacias and other trees. One of them is called "Qadow" which nomads believe that when Camels eat it they produce more milk. Another one is "Dhiillowyahow" which is believed to break thirst. This natural forage supplementation is required to avoid long distance walking in search of forage which affects milk production.

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USE OF SALT

In order to efficiently utilize available forage, Camels, whether milking or dry are provided with salt, salty water or salty plants. Salt and salty soil are given at the onset or shortly after the first rains when forage is expected to be abundant. When forage is limited in dry seasons, Camels are browsed/grazed on salty plants or watered with salty water. If neither is available, salt is dissolved in water and given to them. Camel owners believe that salty water cures deffective udders, other ailments and best of all enhances efficient use of dry period forage. But the fact is that salt is required for thermal resistance and blood regulation.

BREEDING

Proper breeding of Camels is very important to the nomadic system of Camel management. A unit of the Camel herd is specifically owned by a unit of family (Husband, wife, children younger brothers and sisters). This unit of camel herd usually consists of:

1-One mating male "Baarqab".

2-Castrated males "Goolal" not used as pack or draft animals but kept for sale.

3-Castrated males "Baarfuran" or "Koran" used for pack and draft.

4-Young males 3-years old to be castrated for the purpose indicated in numbers 2 and 3 or used for:

a- Exchange of young females.

b- Given as gift to needy relatives.

5- Pregnant females.

6-Milking females with calves.

7-Dry females which include:

a-Old females and defective ones not needes to be bred but kept for sale.

b-"Galoof" females with seasonal abnormalities which may give birth once or twice or kept for sale like castrated males.

c-"Abeer" mature young females for breeding but due to infertility problems could not breed at early ages. These are given or sold

after waiting up to eight years.

8. 3-5 years old young females kept for replacement and /or for additional breeding.

The pregnant and milking females are generally about equal in number. Breeding starts at the on-set of the "Gu" rainy season. The mating bull then becomes sexually inactive the following "Xaga" season though it stays with the females all the time . At the beginning of the "Dayr", second rainy season, it becomes again sexually active and breeds those females not bred in the previous "Gu" season. Only one rutting male with a certified performance through its past off-spring (high milk production etc.) is allowed to breed the herd. Selected young males are also kept for replacement. If an excellent breeder is not available in the herd, then the owner borrows one from his relatives .The rutting male can breed up to 100 camels at a time.

As mentioned above the rutting period is, therefore, the "Gu" and "Dayr" seasons. Females breed in "Gu" season give birth in the following "Gu" and those bred in "Dayr" season produce calves the next "Dayr" season. Thus the gestation period of camels is about 13 months. Camels sometimes produce calves in the dry season but this is very rare. Young females are bred or reach sexual maturity when five years old and give birth to their first calf a year later. However, breeding at the age of 4 and calving at 5 accasionally occurs. The camel is normally productive for 20 years. Breeding every other year, female camel give birth to seven to eight calves assuming it will breed continuosly. But this never happens in the nomadic herding system. Even if she bred continuously, calf loss is common . Loss of calf crop is attributed to the following factors:

1-Loss as early as 2 months during pregnancy due to forced mating, lack or excess of salt which leads to loss of appetite and diseases such as "Dhugato".

2-Loss at 6-8 months during pregnancy - usually stillborn greately caused by diseases.

3-Loss at 8-12 months - calves born alive but won't survive more than few hours. This occurs generally when rainy season delays and subsequent dry season elongates.

4-Born dead at about 13 months. This is very rare but happens.

5-Live calf loss due to Diarrhoea caused usually by consumption of excess milk, improper handling and lack of sanitary conditions (such as milking the camel with dirty hands, etc., predators, diseases such as eye disease "Agaro", internal injury "dhaleeco", external injury, lip

and leg ulceration "Cadho" etc.

Once the calves are over 3 months of age and in good health chances of losing them are almost equal to that of adult camels. The male and female calves born at any season are about equal in number.

CALVES

When the calf is born the very first milk, produced by dam is called "black colostrum". Most of it is usually milked on the ground and discarded. The nomads believe that milking "black colostrum" immediately after birth stimulates and enhances more milk production in the dam. Two to five hours after birth the calf stands up. With the help of the owner, it starts sucking the remaining "black colostrum". The calf continues sucking the fresh colostrum partially or totally depending on the ability of the dam in milk production for the first few days .If the dam produces more milk than the calf requires, the calf is allowed to suck the appropriate amount it needs and the remaining is milked for human consumption, the owner attentively watches calf suck. To avoid calf loss due to the excess sucking, if the dam does not produce enough milk, the calf stays with her all the time to recieve the required amount.

Secretion and production of milk increases gradually after birth in some dams, it may take weeks to reach normal milk production . Despite this, some dams unexpectedly produce more milk. In such cases, the calf is separated from the mother during the night and only allowed to suck 2-3 times during the day, but under a close observation of the owner. Through past experience, the owner can easily tell whether that particular dam quickly regains more milk production or not. If the dam does not produce enough milk, the calf stay with her day and night without special care. Low milk production during early birth days is usually attributed to heridity (low milk producer) and the quantity of black colostrum milked out at birth. The growth of calf in the first 2-4 weeks depends on the kind of husbandry given. If properly treated like giving appropriate amount of milk, protected from ticks, etc. the additional milk allowed to suck will just help the calf grow vigorously.

The calf-dam separation depends first on the availability and quality of seasonal forage and secondly the competition between man calf for milk. Early separation occurs during rainy seasons "Gu'" and usually starts when the calf is about 3-4 weeks old. At this time plenty of good quality forage is available. During the dry seasons "Xaga" and "Jilaal", usually no separation takes place especially during the "Jilaal", period. Two out of the four teats are covered by tying on especially prepared soft Acacia bark fiber, called "marq" while the other two teats are left for the calf to suck throughout the day on the range. However,

if the calf was well fed in the previous rainy season and it is healthy and vigrous, it would be separated from its dam the following dry season. This practice varies from place to place and rarely affects the proper growth of the calf. It also provides more milk for the family.

For the first week of separation both calf and dam miss each other so much that both keep crying continously. The dam seldom browses grazes and every minute it tries to come back where her calf is kept. The affinity between calf and mother is well expressed in the following Somali poem which is translated here in english:

"Eridhabanka Geeluba	"Newly separated mother
Goortu Ilmaha Tabo	camel when she misses its calf
Halka loogu Oodiyo	Unless she comes back home or
Isagoon Rugtii imen	where the calf is tied never
Afka baad ma galin karo	browses or grazes
Dhulkan ma daayo"	But cries and cries".

Keeping the dams away from home is a very tedious job. Usually two persons take care of it. The calf separated from his mother is kept in a small thorn fence, "Edag", for approximately an hour after the dam is taken away. Then it is released and kept near the home usually under a shade tree when it is hot or protected in a thick thorn shelter in the cool season. After about two weeks it starts browsing/grazing and no longer has to be fenced. The young calf wanders around the home area freely and voluntarily comes back home in the evening. Immediately as the dam arrives home late in the evening the calf either freely sucks or the dam is first milked and then calf sucks. Distribution of milk again depends on the need of the family.

The reunion of the young calves with the herd usually takes place when the dams are bred after a year and stops milk production. But if it is not bred or fails to become pregnant, union may be suspended and the dam may continue to produce milk for another year. However, if the dam does not produce much milk but the calf continues to suck, then the owner punishes the calf. Either the tip of the tongue is punctured with a shrp blade so that it will not be able to suck, or a two forked sharp wooden stick is tied above the nose of the calf, so that when it tries to suck, the sharp sticks pierce the skin of the dam and she runs away.

When calves are born dead or die shortly after birth, and the nomads need milk from the dam who lost her calf, they bring another calf and rub the embryo duct fluid on it. Usually the dam accepts the new calf as her own but she sometimes refuses. If the dam refuses to accept the foster calf, then, severe punishment is given by piercing a sharp stick warpped with a rope in her nostrils tightly to

partially suffocate her. At the same time the anus is closed with two pieces of wood that fit each other exactly and tied with a rope on both sides. Sometimes one of the front legs is bent and tied so that she won't be able to sit or walk but keep standing. The owner checks frequently whether she lets the calf suck her or not. The punishment continues untill dam completely accept the calf as her own. Some namads use the skin of the dead calf for milk stimulation without punishing the dam.

CASTRATION

Nomads castrate their male camels. The major objectives of castration and procedures are as follows:

Objectives:

1- For easy handling.

2- For economic purpose- fattening.

3- For preventing undesirable breeder.

4- Others.

Procedure:

1- Tie a rope on the head of camel.

2- Tie two front legs together.

3- Make it sit down.

4- Bend neck backward towards the hump.

5- Lay it down to one side.

6- Tie four legs together in crisscross.

7- Somebody sits on the hump holding the tied head.

8-To open the scrotum close to the attachment near the hind legs with a sharp blade or a razer.

9- Take out testicles.

10-Cut off.

11-Treat the wound with medicinal plants. Sometimes the wound is filled with animal or plant hair.

12-Let it stand up.

13-Tie it to a tree for few hours.

14-Release to graze.

15-The wound cures within 7-30 days.

The process takes place in about an hour and death loss is almost nil.

CONCLUSION

Somalia stands first in the world in camel herding and with more than five million Camels it represents 44% Camel population of Africa. For Somalis camels are precious because they play a significant role in the national economy. They are used for milk and meat production and for transportation locally, and exported abroad together with other livestock to earn foreign exchange (hard currency) for the nation. Despite the camels economic value, their ability to survive in harsh environment longer than any other livestock, their tolerance to drought and water stress, little is know about their management in relation to browsing/grazing and watering behavior. Therefore, this preliminary observation has been designed to start the process of building up basic information, not only on management, but also on browsing/grazing behavior and the plant species they consume. The observations only give indications and are expected to lead to more detailed and complete studies.

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ROOT & TUBER CROPS OF SOMALIA
Manihot - Cassava

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INTRODUCTION

The root and tuber crops grown in Somalia are Cassava, Sweet Potatos, Carrots, Sugar Beet, Radish, Onions and Raffanello. Except Cassava the rest are grown on very small scale and are called yard crops because the farmers grow them around their houses or farm yards. Cassava is, however, grown widely as compared to the other root & tuber crops in Somalia.

Manihot, Cassava, Monioc or Trapioca plant is of American origin which was taken overseas as a vegetable about the year 1500. The written records of the period of Portuguese ascendancy on the oceans provide us with abundant evidence of the success of Cassava plant in Africa. Now it is grown widely as a crop for food or industry throughout the tropical countries and Europe. Leading producers are Brazil, Zaire, Thailand and Indonesia. In Somalia Cassava is cultivated on a small scale on sandy areas between Mogadishu and Balcad (40km neth of Mogadishu). Major constrains that make Cassava cultivation difficult, in spite of its being very usefull, are the
following:

a) Insufficient and eratic rainfall: While Cassava crops need plenty of water, in Somalia maximum mean recorded during 1926-61 is 596 mm in Afmadow at 36 m above sea level and minimum mean recorded during 1934-72 is 14 mm in Bosaso at 2 m above sea level (Anselmo 1979).

b) Poor soil condition or soil structure: Cassava needs high loamy sand, moist and deep, well prepared with a good drainage. Such suitable and fertile lands in Somalia are already used for other more profitable crops.

c) Lack of market.

d) Unawareness of the people.

Inspite of the fact that Cassava needs abundant water and loose soil, its small scale cultivation in Somalia shows that it can be grown well in the soils depleted by repeated cultivation but just have free drainage, or the soils where

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no more further crops can be grown. In the lines below the traditional methods of cultivation of Cassava in Somalia and its uses has been reviewed following some suggestions for improvement.

CULTIVATION OF CASSAVA

Soil: No detailed soil survey has been conducted throughout the country except on specific project areas for intensive agricultural purposes. We have no details of the soil characters and chemistry of the area where Cassava is cultivated but the detailed soil investigations on agricultural areas in the neighbouring areas indicate that most of the soils are alkaline in reaction with a PH varying between 7 and 8.5 with a low mineral content.

Rainfall: The Cassava growing areas as the other parts of Somalia get rains twice a year. The major raing season "Gu", is in spring during the months of April to June, followed by a more or less dry summer, "Hagaa", in June to September. The second rainy season is in the months of September to November of fall, "Dayr", followed by long dry period of winter from November to March. Balcad with an elevation of 107m from sea level has a mean rainfall of 505 mm (Anselmo 1979) which is well distributed throughout most of the months of the year.

Preparation of Land: Cassava growers first clear the area from weeds to minimize competition and remove other obstructions beneath the soil. At the beginning of rainy season the soil is loosened with hoe or other sharp locally made instruments. Where mechanization is available they plough and disc the soil to prepare good seed beds.

Transplantation of stakes: At the beginning of rainy season the Cassava stakes (cuttings) are planted in the previously prepared moist soil. Fresh stakes from mature plants are used because the common storage practices usually cause poor sprouting, reduce plant vigor, loss of moisture, and exposure to the attack of insects. Somali farmers do not used stakes with uniform diameter, usually the stakes are 40-50 cm long. Stakes are buried in the soil about 10 cm deep and about 1 m apart. Through practical experience, the local farmers are of the opinion that deeper than 10 cm plants will not produce high yield. Similarly it has been observed that there are no significant differences whether the stakes are planted vertically, horizontally or inclined.

Weeding: During the growth stages of Cassava plant, weeding is required 2-3 times in "Gu" and once or twice in "Dayr", usually when the plants are 9-18 months old.

Harvesting: Cassava is harvested by hand. First the tops

(leaves and stems) are removed and then the roots are removed from the soil with the help of hoe. The crop is usually harvested in the dry season, when there is fodder shortage for the livestock, and the prices in the market go up. Cassava grown by the traditional system produces 5-20 tons of roots per hectare and at the peak of dry season the prices go up to Somali Sh. 200 per qt. against the price of Som. Sh. 100 per qt in wet season (Said 1982). The farmers, therefore, usually stock their products in wet season waiting for the dry season.

Uses: It is customary to divide the races of Cassava into two groups sweet and bitter. The group called sweet is characterised by the relative freedom from poisonous properties. Such properties perhaps vary with the time. The bitterness is due to the presence of toxic component hydrocyanic acid. The presence of hydrocyanic acid varies from place to place and its content tends to be higher on poor soil in dry conditions. Somali farmers say that the bitter type has large leaves and branches while the sweet one have smaller leaves and branches. Sweet Cassava is partially used for food. Roots are washed and peeled. Peeled Cassava is then cut into small pieces, mixed with bean and bioled in water. Th water is thrown away and ghee or oil is added. It is spiced to taste and eaten.

Bitter Cassava, dried peels of sweet Cassava, roots, leave and stems are fed to domestic animal sometimes mixed with sorghum and maize or just without any addition to the livestock in the dry season or in drought.

CONCLUSIONS

Cassava is grown in somalia for many years and the small scale plantations shaw that the crops can be extended to large scale if other suitable places are explored. The methods of cultivation and the agricultural equipments used are old fashioned and inefficient. Some small trials are needed to improve the method of cultivation, storage of roots and introduction of improved seeds. A spacing trial conducted in somalia showed that 10,000 plants per hectare decreased the hieht and diameter of the stems but produced the highest yield. The experiment was carried only one year and reliable results need longer study.

It has been observed that the farmers are not encouraged to extend their plantations due to a limited demand of feed for the domestic animals and livestock only in the dry season or drought. If we see in some other countries sizable industries has been developed to produce Cassava products, the most important is starch industry. Starch is not only used in food industry but forms the important ingredient of many other products and is an exportable comodity. It is, therefore, worth consideration that along with the extension of Cassava plantations the development of a small scale

industry to use the Cassava roots may also be planned.

Cassava growing areas are very close to the shabelle river which passes few Km away from the area near the town Balcad. Thus, large scale Cassava plantation could be carried on under irrigation.

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VANISHING BIRD-LIFE OF THE SHABEELE VALLEY

R.J. Douthwaite*

Over the past two years significant losses to the bird-life of the Shabeelle valley have been caused by various forms of intensified land use.

Farming activities have destroyed what may have been Somalia's only breeding colony of Marabou Storks, Leptoptilos crumeniferus, at Beerta Siyago a few kilometres north of Mahaddayweyne. The Marabous nested with smaller numbers of Pink-backed Pelicans, Pelecanus rufescens and Yellow-billed Storks, Mycteria ibis in acacia and fig trees on the river bank. In February 1983 about 250 pairs were present, but during the year farmers cut and burnt the trees and a year later only seven nests were seen in two dead acacias.
The farms are now being extended northwards into forest occupied by a Goliath Heron, Ardea goliath, colony.
With the exception of a breeding record of Goliath Heron from northern Somalia, none of these species has previously been noted nesting in Somalia (Ash and Miskell, in press).

Construction of a flood prevention bund at War Gaab near Balcad ensured the destruction of the first Cattle Egret, Bubulcus ibis, colony found in Somalia. In May 1982 between 500-1000 pairs of egrets and smaller numbers of Sacred Ibis, Threskiornis aethiopica, were found nesting in flooded Acacia nilotica bushes, but the site then dried out and was converted to farmland.

Tsetse fly, Glossina spp., eradication in the Balcad area, in early 1983, was followed by the introduction of large numbers of cattle to Romsoma farm, with dramatic consequences for the vegetation and wildlife. The ungrazed perennial grassland between dune bushland and river received particularly heavy use, to the detriment of three rare bird species: Hartlaub's Bustard, Eupodotis hartlaubii, Red-winged Bush lark, Mirafra hypermetra, and Zitting Cisticola, Cisticola juncidis. 'Birds of Somalia' (Ash & Miskell, in press) describes Hartlaub's Bustard as rare and local with only four old and one recent record. A small population was resident at Romsoma until cattle were introduced, but on recent visits only one bird has been seen, in nearby bushland. The Red-winged Bush lark is given as an uncommon resident in south east Somalia below 3 N. It was formerly very common at Romsoma but on recent visits only two birds have been seen. Only two old records of Zitting Cisticola were known to Ash and Miskell but a

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large population existed at Romsoma. This now appears to be extinct.

These examples illustrate the speed with which the wildlife and seminatural habitats of the Shabeelle valley are disappearing in the face of development. Such losses are not inevitable, but there is an urgent need for action by Government if any features of ecological interest are to survive the next few years. On the one hand, conservation sites must be identified and adequately protected, and on the other, adverse environmental impacts of present and projected land management practices should be identified and moderated.

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HUNTING IN JOWHAR REGION

Bashiir Barre Booh*

INTRODUCTION

Hunting, that is catching animals for food by trap, by bow and arrow, by chasing, or by gun, is the oldest food gathering system in the world. Centuries ago hunting was common throughout the world, but because of different stages of the development in different part of the world, subsistence hunting is now confined only in the third world countries, especially in Africa, where it provides basic food for thousands of people.

Hunting in Somalia is much more frequent in the southern region where many people still use the bow and arrow, as compared to the northern regions. Hunting is very common in Jowhar region particularly at Mukay-dheere village. I had spend sometime in 1974 at Mukay-dheere during the illiteracy compaign and made observations on the methods of hunting by nomads. Recentely I visited Mukay-dhere again and had the opportunity of interviewing a very experienced hunter of Jowhar Region, Mr. Muse Jisaar. My observations and Muse Jisaar's experiences made it possible to write the following lines on the nomadic methods of hunting in Jowhar Region.

METHODS OF HUNTING

Mukay-dheere is a small village surrounding by the Shabelle river. It is composed of approximately 150 huts with a population of 300-380 inhabitants. The village is 20-25km north east of Balcad. The people of village are all farmers, the only animal they raise is chicken.

In the dry seasons when there is no rain and the level of water in the river drops down or dries up the people trun to hunting. Hunting in Mukaay-dheere village has special methods, rules and regulations.

Hirin is a traditional name given to any group of hunters, consisting of 15-30 persons. The head of the Hirin is called Hargaanti. At the Mukay-dheere village there were two Hargaanti namely Mohamed Hurow and Muse Jisaar.

Every male above 17 years of age can participate in the hunting group or Hirin as long as he is trained and obeys the orders of the Hargaanti. Every member of

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Hirin, who has killed several to many animals is called Ganaay.

As soon as harvesting time finishes, every person gets ready for hunting. New arrows and bows are cut from the woods. During the preparation period they either buy a poison from the town or village or they collected some small dried wood from the dry river bed. By tradition, the poisonous wood is said to have washed down the river from Ethiopia. This wood is put in a pot containing water and other substances and is left to be fermented. Later the water is evaporated and the black waxy residue is collected. This kind of poison is not so efficient. The poison which they buy from the market is considered very effective. The potency of the poison is measured by the distance the wounded animal goes after the shot. The poisons are usually tested on warthogs.

When everything is ready a man goes around the village announcing, under the order of the Hargaanti, that there will be hunting tomorrow. Next day after lunch, the hunters form groups and go out. Before they make the attack, all of them sit under a shady tree, put off their shoes and loosen the tightness of the bows. Then the Hargaanti asks if there if is any person who has committed any sin or evil. Muuse Jisaar explained to me, "That it means, If any of them encountered a women or a girl illegally, or if there is enemity between two persons in the Hirin. "If there is any such action", continued Muuse, "The person who is guilty will sit infront of the Hirin and all the members beg the God to forgive him. "This is called carb-maris" added Muuse. Carab-maris is necessary because they believe that guilty person or his group may not get any thing or they may encounter problems while in the bush. Then the Hirin selects 3-6 persons who shout and beat the bush to make the wildlife run out to a particular direction; the rest of the hirin members surround the bush forming a semi-circle.

Every person in the line sits under the bush without a shirt, otherwise the animals may see him and run back. Explaining the rule for dead line Muuse Jisaar said, "There is a rule which says that every hunter must shoot only the area directly facing him forward or backward . Side shooting is absolutely prohibited". When the shouting and the beating takes place all the wildlife in the bush run to the direction of the deadline where they are shot.

The most abundant wildlife usually hunted are "cawl","diirdiir", "garanug", "dabaar", and "dabataag".

Whenever a man in the deadline shoots and he is sure that he hit a "diirdiir", "dabaar" or "dabataag" with his arrow, he says, "Habaar waaye" that means "I am cursed". All the other say, "baar kuma qabto" that is,"Curse would not effect you". I asked Muuse, "Why the curse?". He smiled and said

"Actually, the wildlife belonged to the devil or satan, so when it is shot the satan as well as the animal may curse the killer". Again I inquired from Muuse, "What could happen if the killer does'nt say the word, "Habaar waaye", "Yes" he said, "He will get sick or probably he meet an accident, may be an arrow accident in the bush"."Have you ever met with an arrow accident?" I asked him. "No, but a friend of mine about 10 years ago had died with an arrow accident". When the animal is shot it runs few meters to two kilometers. This depends upon the efficiency of the poison and the part of the body wounded.

Surprisingly, every one in the Hirin can differentiate the foot prints of warthogs; sheep, goats, from "diirdiir", "dabaar" and "dabataag". The hunters not only identify the foot prints even in the soil covered by grass but will also tell the time the animal crossed that place. While searching for the body of the shot animal, if any of them sees blood, shed from the animal he says, "Carwo", probably it means?. " I see blood". The others answer "Ori hirineed". It may mean, "The animal is belonged to the Hirin", The first man who finds the fallen body of the animal, says "Gol", the rest of the Hirin may say, "Babaar xayle', which means "congratulation".

They surround the fallen body of the animal, loose the tightness of their bows and a man stands close to the middle of the animal's body and sings a traditional hunter's song, "Sameey Libin lihideeysuubanow nin san waa soor iyo salaan mudan", which means nearly youR poison have the victory; a good man deserves food and salutations. When the song is finished, the animal is slaughtered, some parts of it are eaten in the bush, while the rest are divided equal among the Hirin for carrying to their families.

Hunting in Mukay-dheere is not only confined to the day time, it is also common in the night. Night-hunting is called Cimil. In night hunting 1-4 hunters sit one to two kilometers aparts, depending upon the strategic position. Such points are searched in the day time by locating the foot-prints of wildlife, the water points or river banks with fresh grass, and along these paths they build their hides with the help of branches cut from the bush, leaving a little opening directly facing the path. In the night the hunters sit in these hides and watch the animal movement. They shoot every animal in their range for whole night.

At the break of dawn they come out of their hides and collect the fallen wildlife. Hunting in the night has disadvantages to the hunter because when the wounded animals collapse they are attacked by the predators like the hyena and leopard. If any part of the animal's body is touched by these predators, such animals are discarded and are not eaten by the hunters.

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CONCLUSION

Uncontrolled hunting has negative effects on the wildlife because it may break the ecological system between the prey and predators. Secondly it may cause wildlife immigration or extinction. Hunting is also illegal according to the regulation of the government.

At Mukay-dheere village hunting is common because of the poor crop production, resulting from the shortage of agricultural facilities. None of the families has more cultivation then one hectare. If the government provides these farmers with some facilities in the form of tractors, oxen and other equipements and encourages farming, I think they will leave hunting for their food. In general the wildlife in Jowhar region can be managed, if the programmers of agricultural development keep in view the importance of the presence of wildlife at least in some areas and do not clear the lands indiscriminately. If a legal line is formed between the rangeland and cultivated area, I think the wildlife can be managed and conserved.

Appendix

Common Names for Wildlife Species

Somali Name:	English Name:	Scientific Name:
Cawl	Soemmering's Gazella	Gazella Soemmeringi
Diirdiir	Lesser kudu	Tragelaphus imberbis
Garanuug	Geranuk	Lithocranius walleri
Dabaar	-	-
Dabataag	Dibatag, Clark's Gazella	Ammodorcas clarkei

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FORESTRY ACTIVITIES IN SOMALIA

Mohamed Mohamuud Jumale*

INTRODUCTION

Somalia has a land area of 63.8 million ha and a population of 5.1 million according to 1980 census. Practically all Somalia is either arid, semi-arid or hyper-arid with modrate, to high, to very high desertification hazards. The country is predominantly a pastoral with a high nomadic population. Livestock raising and agriculture are the main activity of the economy. Infrastructure is relatively poor with the social services still very inadequate. According to the World Bank estimates the per capita income of the country was US $ 70 in 1960, US $ 80 in 1970 and US $ 110 in 1976.

The history of land use in the natural woodlands of the country is one of the steady continuous deterioration. Uncontrolled cutting, uprooting of wood growth, excessive and unregulated grazing in the woodland and shifting cultivation in the reverine areas are the principle causes of such damage. The series of causes accumulating over the years has disturbed the established ecological balance and made the land, livestock and wildlife and inhabitants far more vulnerable to the range of periodic droughts.

For a considerable time but significantly since the early 1970's the government being aware of the steady and serious deterioration of most forest areas due to the conditions explained above, included in five years development plan 1974-78 a major policy on forestry aimed at curbing the rate of deterioration, mobilizing the forestry potential to meet the country's need for fuelwood and timber on sustained basis. Poor rain fall in 1973 and a vertual absense of rain in 1974 and in the first half of 1975 resulted in a widespread crop failure, and led to onslaught of drought which caused terrible damages of livesatock, ranges, forests and human life. The conditons after drought demanded more attention and priority towards the developments of range and forestry and therefore, the government created an autonomous body, "The National Range Agency" in 1976 to look after and develop these natural resources. The policies were revised and more funds were diverted towards the development of Ranges, Forest and Wildlife and the other related descipliines.

Only 8.8 million ha or 13% of total area is covered by forests which include 50,000 ha of Juniper forests, 40,000 ha of reverine forests, 2,500,000 ha of dense savana,

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6,197,000 ha of bush and shrub and about 3000 ha of trail plantation including shelterbelts. The true forest areas of Somalia constitute less than 4% of the land area.

The main forest products are fuelwood, wood for charcoal (80,000 tons of charcoal in 1980), Frankincense and Myrrh Gum (394,000 kg in 1978) and a small quantity of nutseeds and medicinal plants mostly for the local market.

Neither the forest area nor the standing volume in forests and dense savanna (100,000 ha) is adequate to meet current wood demand which according to the recent conducted studies are: Round wood 144,000 cubic meter in 1980 and 353,000 cubic meter in the year 2010; fuelwood including an equal volume of charcoal wood 5.6 million cubic meter and 13.7 million cubic meter in the year 2010. The annual charcoal demand for Mogadishu alone is 26,000 tons in 2010. The average yield in charcoal production areas was estimated as 2.5 million cubic meter. Solid wood if all species are used.

GENERAL ACTIVITIES

The general activities of forestry so far can be summarized as follows:

(1) Creation of 39 forest reserves covering 390,000 ha.

(2) Establishment of 2,000 ha of plantations.

(3) Creation of 6 forestry research sites.

(4) Stabilizing of 12,500 ha of sand dunes.

To help in achieving the above objectives many international organisations were approached and it is encauraging that many of them like World Bank, US-AID and GTZ etc. offered finances and experts.

Under a project "Stregthening of the Forest Department" at the National Range Agency a group of experts are working on developing a ten years program of forestry in Somalia, some of the Somali students were sent on training abroad and it is hoped that more will be sent. Beside the following activetias have also been started and these will definitely help towards the achievement of the National gaol.

Qorioley Forestry Project, Save the Children Federation/US-AID

The Qorioley project planted approximately 160,000 trees in May-June this year. Trees were planted on approximately 90 ha. of fuelwood plantation as well
as 10,000 trees distributed in the community, camps and villages for planting around homes and in public places. Also included in the total production are some 40,000 trees started as direct seeding. Land clearing necessary for the

fuelwood planting was accomplished prior to planting using a strip system of cleared land alternating with 3 meter strips of uncleared brush. Initial survival and growth appears acceptable and further planting will proceed with the next planting season. The nursery exceeded its production goals by providing several thousand seedlings to the Shalambod dune project and further cooperation between these two projects is expected.

Jalalaqsi Reforestation Project, Africare/USAID

The cooperative agreement for the Jalalaqsi Reforestation Project was signed on April 28, 1983, Mr. Mel Foote, Africare Director in Somalia, has done an outstanding job of organization of the project and making contacts in Jalalaqsi. The first of the Africare expatriat staff arrived in the latter part of June and the Project Forester is scheduled to arrive in early September. Targets for Africare are 44 ha. of fuelwood plantations, 160 ha of shelterbelts, and 20,000 trees to be distributed in the community, camps, and villages. The Jalalaqsi Project will develop one central nursery at Jalalaqsi, one nursery for the production of trees for the dune project, and four smaller nurseries at the refugee camps.

Hiran Refugee Reforestation Project, CARE/USAID

The project agreement with Care for the Hiran Refugee Reforestation project was signed on June 4, 1983. Mr. John Miskell has been serving as acting Project Forester until the arrival of CARE staff now estimated to arrive in the latter part of September. Working with ERDGS, CARE has made arrangements for production of 60,000 seedlings for planting this October. Site selection and other preperations have already begun. Targets for CARE are 770 ha. fuelwood plantations, 32 ha. shelterbelts, and 54,000 trees to be distributed for shade and amenity plantings. ERDGS, which now operates the Belet Weyn nursery, will phase out of forestry projects at the end of this year. CARE will accept the continuation of the refugee camp nurseries while GTZ as part of the CRDP will accept the main nursery at Belet Weyn.

National Woodstove Project, VITA/ USAID

The National Woodstove project agreement was signed March 31, 1983. Through testing and design, this project will develop and distribute 8,000 improved woodstoves in five regions of the country. The first class of trained extension workers has just completed their training at a center established at the National Foundry and are now scheduled for placement in the field. Testing and design work will continue in cooperation with the National Foundry, leading to development of improved woodstoves and other cooking systems which reduce the demand of fuel. Initial results are that improved stoves can save as much as 27-68% of the wood

fuel consumed by three stone cooking methods.

Luug Refugee Reforestation Project, ICR

The Interchurch Response for the Horn of Africa project at Luug in the Gedo Region is a continuation of forestry work started during ICR's initial work with the refugee camps in the area. They have developed a unique system of seedling production which fully involves the camp members. In the eight camps they have extended their project into, they have successfully introduced at least one shade tree to almost every home. They now have in production several thousand trees for planting in October. ICR as donor may not continue the project after November of this year, however one of the Church groups involved with ICR looking into continuing of the project.

Gedo Region Community Forestry Program, NRA/ USAID

The Gedo Community Forestry project will be headquartered in Luug and continue the large nusery development there already started by ICR. The project has been approved by USAID for funding. Expected production for a three year program will be 195 ha. of fuelwood plantations, 30km of shelterbelts, and 50,000 seedlings for distribution in the community, camps, and farms. The ICR project will continue working with the eight camps near Luug while this project will expand into four new camps and four farm settlements as well as a community woodlot near the city of Luug. The first large scale outplanting will be started in May-June 1984.

Afgoi Forestry and Wildlife Training Center, NRA/UK ODA

The UK lecture team of Mr. Leafe, Mr. Orr, and Mr. Jenks arrived in Mogadishu in mid-July and immediately started the transition from the Pakistani team which has been at the school for the past two years. The UK team will continue the excellent work begun by the Pakistani team while the level of training and facilities continues to expand. There were 14 students graduated in April 1983 while 47 new students were enrolled. In order to produce a class each year, 30 students will enter in April 1984 requiring expansion of both staff and facilities. Training materials have been received from the USAID, UK ODA, and the UN FAO.

ERDGS-Ecumentical Relief and Development Group for Somalia

ERDGS has been involved in refugee projects in Somalia for several years. Their current forestry activities are associated with a refugee agricultural project in the Belet Weyn area in the Hiran Region. They are operating the Belet Weyn nursery and two others located near regugee camps. They have received limited funding from UNHCR to continue the project through the end of 1983. At that time ERDGS direct activity in forestry projects will terminate. However, all

their projects will be continued with other donors. GTZ (see next paragraph) will accept the main nursery at Belet Weyne, while CARE will accept the refugee nurseries and continue the plantation work. CARE expects to accept their part of the activities in October 1983, while GTZ will assume its share the following month.

GTZ-German Agency for Technical Cooperation-CRDP/NRA

GTZ has developed a forestry component as part of its Central Rangelands Development Project activities. They expect to have their forestry staff in November 1983. Three nurseries located in Belet Weyne, Dusa-mareb, and Galkayo will be strengthened under this program. As discussed under ERDGS, the nursery at Belet Weyne will operate with ERDGS assistance until November when the GTZ staff arrives to accept the site. The Project plantings will include town shelterbelts and fuelwood plantations as well trees will be made available for personal use around homes, farms and communities. The CRDP staff have also indicated training to be accomplished at the three central nurseries to provide staff for smaller project nurseries at various shelterbelt sites.

Improved Charcoal Production TPI/NRA

Mr. Alan Robinson of the UK Tropical Products Institute is working with the charcoal production cooperative camps in the Bay Region to introduce an improved kiln developed by TPI as well as make recommendations for improvement in traditional methods of charcoal production. Mr. Robinson has also constructed a demonstration brick kiln at the Afgoi nursery site and will continue with demonstration and instructions in use and construction. FAO has also committed a charcoal expert to a project here, however, his arrival is not known at this time. The project involves the construction and demonstration of a stationary beehive kiln at Afgoi. The project had been started earlier but construction was not complete at termination of funding.

Shalambod Dune Control Project UNSO/UNDP/NRA

Work at the Shalambod Dune Control Project continues under the direction of Associate Expert Mr. Puccioni. Funding and staff problems have limited this project causing concern as to if the projected 100 ha. per year schedule can be successfully met.

OXFAM-Oxford Committee for Famine Relief

Oxfam is involved in material and equipment aid to several forestry projects thoughout the country. Most of the aid has been in the form of donated hand tools, but they have also provided fencing materials, donkey carts, nursery pumps, and at least one vehicle. Their aid is provided directly to the

district council, village councils and NRA project teams.

Euro Action Association for Cooperative Research and Development

Euro Action Acord, a multi-national private donor group is involved in an agricultural project at the Sablale settlement under agreement with the Settlement Development Agency. As part of the project, they will establish shelterbelts, fuelwood plantations, as well as shade and fruit trees. They are expected to seek cooperation from local NRA nurseries for seedling or nursery development assistance.

World Food Program

WFP has provided benefits to over 2900 workers in 100 sites throughout the country under cooperation with the NRA in the forestry sector (another 12,000 workers in other NRA projects also benefit from WFP food). Continuation of WFP aid seems limited and, therefore alternate sources of funding this labour project are being explored.

CIPL

The CIPL unit of the Ministry of Finance is working with our Forestry Department to develop funding for nursery and plantation labour for a number of projects. When successfully arranged, this source will provide local currency for most of the forestry projects. A daily wage of Som.Sh. 30 have been proposed.

Other projects

The French Date Palm Project is not yet active and various education grants have been discussed under other topics in this meeting. USAID is also planning to fund and manage a fuelwood market study which is yet in development.

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ACTIVITIES OF THE AFGOI FORESTRY AND WILDLIFE TRAINING CENTRE June 1983 - January 1984.

John D. Leefe OBE*

INTRODUCTION

It is ecouraging to report that much progress has been made, at the Afgoi Forestry and Wildlife Training Centre, since the last account in the June issue 1983 of the Somali Range Bulletin. This report is an attempt to highlight the main development in the period under review and to forecast how the Centre is likely to extend its activities.

STAFF

In June 1983, Mr. Ahmed Hassan Ofleh was appointed Director of the Training Centre, having served for two years as Personal Assistant to the General Manager of the National Range Agency.

On 14th July 1983, the new Principal John D. Leefe OBE, arrived in Sanaha with his wife, Sybil. He was also accompanied by John A. Jenks, one of the two forestry lecturers appointed by the United Kingdom Overseas Development Administration. The senior lecturer, Andrew C. Orr, followed shortly afterwards on 4th August 1983, thus completing the UK Training Team. In October 1983, Mohamed Gelle Mohamed joined the teaching staff on graduation from Faculty of Agriculture, Somali National University. He has been appointed as counterpart to John A. Jenks.

In December 1983, regretably, the Centre said goodbye to Mr. Said Ahmed, the wildlife lecturer, when he resigned from his post. Said was most enthusiat about his subject and he will be missed. January 1984 also saw same remanagement of the teaching staff. After giving devoted service to the Training Centre, Mazhar Ali Kassimani, a Pakistani national, was formally transfered to the NRA Gedo Community Forestry Project as Technical adviser. He will, however, continue to assist the Centre whenever his new duties and time permit.

The other two forestry experts from Pakistan will fortunately remain at the school. Choudry M. Saleem will continue as a full time lecturer and Mohammed Saleem as a part-time lecturer caupled with his new assignment as NRA Forestry Extension Officer. It should be recorded that all three Experts have done a good job lecturing at Afgoi and it is most helpful that their servies will not be lost to the Centre.

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Finally, mention must be made of the other Somali members of the teaching staff. They include Mohamed O. Sh. Ibrahim, who has been with the Centre since January 1982, and two part-time lecturers from the Ministry of Education; Ahmed Shire taking English and Ismail Deria Adawe who takes Mathematics. Ismail should become full-time later this year and this will help with the scheduling of subject in which there is a Mathematical basis.

TRAINING PROGRAMME

The second forest technician course at Afgoi commenced in January 1983 with an enrolment of 47 students. 30 of them were selected by the Ministry of Education and 17 by the NRA. For the first six months the emphasis was on English and Mathematics. In June lectures on forestry subjects commenced and in september the first examination was held. The second term commenced in October, new subjects being introduced including mensuration, meteorology, survey, tools and safety and tree identification. From 18th-24th Nov. 1983, 46 students attended a charcoal production caurse at a charcoal cooperative camp site in the Bay Region, 60kms west of Baidoa. This caurse was canducted by Alan Robinson, of the UK Tropical Development and Reseach institute. The students were shown the traditional method of charcoal production before being taught how to use the TDRI designed transportable metal kiln. They were divided into three groups and each group successfully operated its own kiln to produce high-quality charcoal; subsequently transported to the Centre for use in the kitchen. Each student will recieve a certificate from the TDRI.

In December the examinations were held, nine subjects being covered and in addition, a practical examination was given. The results of the two term examination were then aggregated and eighteen students not reaching the pass mark of 50% were requested to leave the centre.

In January 1984 the third term commenced with 29 students in the senior course. Practical work on two days per week has been introduced and covers, at presents, silvicultural operations, surveying, meteorology and mensuration. From February 11th to 16th the students will gain further experience of field operations at the SAVE-Qorioley forestry project, under the giudance of the Project Coordinator John. Nittler and Project Manager Abdirahman S.Nuur. It is also intended that they will return during the planting season to carry out tree-planting. A Junior course will also be enrolled this term, of which twenty nominations are coming from the Ministry of Education. English and Mathamatics will be emphasised during the first term, for the Juniors, but forestry subjects and one day practical work per week will also be introduced.

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STUDENT ACTIVITIES

The students remain keen sportsmen and a football and frisbies have been provided. The football pitch has recently been cleared and lavelled and basket ball and volley ball courts are under construction. It is hoped to complete all necessary works this term and when the assembly hall is built efforts will be made to provide indoor games.

Regular film shows are now given, films being obtained from the FAO Headquarters, Rome, UNDP, and the British Embassy, Mogadishu. The Library is gradually being developed and fiction books are already on loan to students. Technical books are being collected. USAID has presented the centre with a very useful assortment of books and leaflets etc. The UK Government has donated £500 Sterling worth of books which should arrive in the next few months. Efforts are also being made to obtain a supply of second-hand books from the Ranfurly Library Sevice in the UK.

Students are also required to undertake work projects in their spare time which will both assist their development and that of the centre.

TRANSPORT

Two Land Rovers and a Ford Transit bus have been provided by the British Government and two other vehicles may be supplied. Further transport will be required as the centre develops.

EQUIPMENT

A wide range of equipment has been supplied by USAID, FAO and UK Technical Assistance; without which practical work could not have been introduced. Further equipment, however, is still required, particularly if the proposals for expanding the centre are implemented. Appropriate requests will be made as the various needs are identified.

BUILDINGS

Full use is now being made of all the buildings which have been provided. Unfortunately, they are proving to be inadequate as the training programmes develop. VITA is providing immediate assistance with the provision of more fuel-efficient cooking facilities but an expansion programme is required. Plans have, therefore, been drawn up to extend the range of buildings, including more classrooms and dormitories, an assembly hall, workshops and laboratories, a sick bay, staff accommodation and facilities for developing Forest Extention and an Utilisation Centre. Financial assistance will be sought from the Somali Government, UN Agencies, and Donor Governments.

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STAFF DEVELOPMENT DIVISION

Mention must be made in this report of the role the Training Centre must play as part of the Forestry Department staff Development Division, which was established on 25th September 1983. Taking a larg-term view, clearly the AFWTC must become the focal point for training activities and at this stage in its development should help to coordinate the various forestry training programmes which are now being carried out throughout Somalia. Excellent cooperation already exists between the Centre and the various forestry projects and no difficulties are foreseen in agreeing how the existing facilities can be utilised to give maximum out put.

As part of the forestry Department Inservice training programme, a course on Nursery and Afforestation methods for Somalia was held from 19th September to 3rd October 1983. This course was generously financed by FAO and supported by all the forestry projects; which supplied both lecturers and some course members. Altogether, 24 persons took part in the course and judging by the comment received, it appears to have been very successful. More couses of this kind are required and when the extra accommodation becomes available, it should be possible to run them concurrently with the technician courses.

FUTURE DEVELOPMENTS

In order to build-up both the Forestry Department and Wildlife Division of the NRA, a wide range of qualified personnel will have to be trained or recruited and trained. The AFWTC plans to identify the various training needs and subsequentiy to provide appropriate courses at the Centre, or through the various forestry projects with training programmes.

An important training objective will be to ensure that there is an appropriate balance between theory and practice, so that all graduates have a practical outtook. To this end, throughout their training, students will be engaged on various field operations and the cooperation of NRA Regional Directors, Foresters and project coordinators and Managers is sought. At Afgoye Forest Nursery, for instance, a Training Section is now being established, each student being responsible for one of the species sown by the school. The plants which are raised will be used for species trials to be established at Afgoye and the proposed fuelwood plantation at km 60, between Afgoye and shalambood 29 species have been sown, including 18 species from arid zones in Australia, the seed being supplied by the CSIRO Forest Research Division of Australia, thanks to the efforts of the late John Maconochie, FAO Range Ecologist.

Three hectares of land adjoining the campus have been

surveyed and an application made to the local Authorties for this land to be transfered to the NRA. This will be used for expanding the Centre, but in adition, another 50 hectares are required for the establishment of irrigated and rain-fed plantations in which training exercises can be carried out. An arboretum is also planned.

Staff training must also be carried out and six scholarships have been allocated by the UK for the Somali teaching staff at the Centre. It is hoped that two members will be able to commence their training in 1984 and subsequently, two in 1985 and another two in 1986. More teaching staff have also to be recruited and trained. UNSO are being requested to provide appropriate scholarships and have indicated their willingness to consider such a request.

CONCLUSION

The AFWTC has already made steady progress since it was opened in 1981, and the first graduates, through their keeness and hard work, have shown that the centre is capable of producing good forester stock. With the continued support of the NRA, International Agencies and Donor Governments it should develop into a very active and important asset of the National Range Agency. All members of the Centre, including the Director, Principal, Staff and Students are proud of their institute and are grateful for the support they receive. Visitors are most welcome, at any time. So please call and see what we are doing. The door is always open.

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"OWN A TREE IN HEAVEN"

Mohammad Saleem Chaudry*

God says:

هو الذى أنزل من السماء ماء لكم منه شراب و منه شجر
فيه تسيمون ينبت لكم به الزرع والزيتون والنخيل والأعناب ومن
كل الثمرات ان فى ذلك لآيات لقوم يتفكرون •

"It is He who sends down rain from the sky: from it ye drink and out of it grows the vegetation with which ye feed your cattle. With it He produces, for you, corn, olives, date-palms, grapes and every kind of fruit: Verily this is a sign, for those who give it thought".

If we read this commandment of God with reference to its context, it will be clear that God has described the system of the universe in a brief but comprehensive way. Here, after describing the propogation of the human race and the economic and aesthatic aspect of animals, God gives clues of an economic system which is clear to those who can think.

This declaration of God was delivered to man in the sands of Arabia fourteen hundred years ago in such a time which is called the "Dark Ages" of our history. Even if we consider this declaration in relation to the tremendous developments which have taken place in recent years the basic fact remains that it is water, plants, animals, agriculture and gardens which are the foundations of our economic and social life. Every aspect of it is thought provoking and it may be due to our short-sightedness, or habitual laziness that we have not given plants the careful attention which they deserve. About a century ago it was generally thought that trees were the property of everybody or nobody. Where this gift of god is still in abundance, in a number of places, more-or-less the same situation exists and people consider that they have the right to cut trees withgout replacing them. Hence they have brought a fuel woods crisis in the many parts of the world. For in the face of the rapid rise in world population in this century the twin demands for farm land and fuel wood land have diminished forests and fuel wood resource to alarming low levels. Whilest everyone has been concentrating on enough food, millions of people are now in a tragic situation. They have food but not the fuel to cook it. According to an FAO survey, the picture in Africa is really dramatic. There were something like 50 million rural people, without access to alternative fuels, who were still deficient in their basic fuelwood supplies in

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the year 1980. These people simply do not have enough fuelwood in their surroundings to cook their food and warm their homes. It is presumed that their numbers are likely to increase to almost 500 million by the end of this century.

In the light of the above, due importance must be given to this alarming situation and we must consider how it can be rectified. If we keep in thinking that everything will happen automatically and that forests will keep growing withgout our efforts, hence we can cut trees without replacing them, the situation must get worse. So, we must do something on a large scale to solve the problem.

If we do nothing, we will be solely responsible, because God says in the Holy Quran:

وأن ليس للانسان الا ما سعى

The meaning of this is "That man can have nothing but what he strives for. At another place in the Quran, God says:

ان الله لا يغير ما بقوم حتى يغيروا ما بأنفسهم

Which means "that verily Allah will never change the conditions of people unless they change it themselves (with their own souls)". Therefore, to improve our own conditions and assist national economy, we must work hard to grow more trees and remember that God does not destroy the righteous deeds of any person. In the Quran we read:

ان الله لا يضيع أجر من أحسن عملا

Which translated means that "Allah shall not suffer to perish the reward of any who does a (single) righteous deed.

In the premaeval stages of life it was tree which was the source of food for man and animals alike. Animals always taken refuge from storms and the scorching sun in the shade of trees. The first dress of man was also made from the leaves of trees and he resided in their shade. That was long ago, but even today, man is no less in need of them though today man does not cover himself with leaves he still expresses his aesthetic sense by using fabrics made from wood pulp i.e. rayon-artificial silk. Today's splendid buildings canot be possible without wood and wood products. Also, domestic decoration is essencially indebted to plantations. Trees are not only acting as natural airconditioners by moderating the climatic conditions, but they also maintain the ecological balance, and ensure that we have a constant supply of clean, fresh air. They also protect fruit gardens and agricultural crops from the cold and hot winds and adjust the humidity in the agricultural fields. Writing paper, cloth, medicines, perfumes, paints, dyes, matchsticks, ships, trains, airships, bullock-carts and buildings all use wood. In time of war, there is no

better camouflage than a forest. Trees also induce rains and maintain underground water resources, as well as helping to prevent floods and check soil-erosion by rain and floods. They play such an important role that it is impossible to imagine how they can be replaced.

In spite of all these facts, it is a regrettable that, there remains a great scarcity of trees in the developing countries, in general, and particularly in the Islamic countries. Some people proffer a weak plea that Islam spread from Arabia and our culture is tinged with the colour of the desert nomads who used to raise flocks of goats and camels. They simply wandered from desert to desert and it was impossible for them to change deserts and wilderness's into green belts. But history tells us that they were not born-enemies of trees, in fact, the centre of their lives was clusters of trees in the deserts and they simply could not neglect the nurturing of trees, Islamic history is not only full of the love of trees but also, the Holy Prophet (Peace be upon him) and his companions who tempted people to grow more and more trees. In this connection, I would like to remind you of three traditions of the Prophet, out of the many which He established. In particular:

من غرس شجرة فانبحث غرس الله له بها شجر فى الجنة

" For a Muslim who plants a tree and that tree grows to maturity, God, in return, will grow a tree for him in Heaven".

Also: ان قامت الساعة وفى يد أحدكم فسيلة فان استطاع

ألا تقوم حتى يغرسها فليغرسها

" If Doomsday is imminent and any one of you (i. e. a Muslim), has a plant in his hand, it is better that he should plant it."

and finally: فلا يغرس مسلم غرسا فيأكل منه انسان ولا دابة ولا طير الا

كان له صدقة الى يوم القيامة

" If a person grows a tree but some other person, animal or bird eats something from it, he will get an appropriate reward until the Day of Judgement".

If you read the above mentioned glorious traditions, with care, you will feel how much Prophet Mohammad (Peace be upon him) has stressed the importance of tree growing. The Holy Prophet (Peace be upon him) has clearly enumerated in the first tradition that who so ever (Muslim) plants a tree which grows to full maturity, God will repay him with a tree in Heaven. The important thing is that the full growth of the plant is required and this means that planting alone is not enough. The tree must be looked after until it is fully mature and only then God will reward such a person with a tree in the Heaven, from which we can conclude that a person

who plants a tree and looks after until its maturity, will at last enter Heavens and enjoy the benefits of that tree.

Now if you think over the second tradition, you will see how the overall importance of plant growth has been emphasised, that anyone (Muslim) who had a plant in his hand and the Doomsday was about to start, would still be expected to plant it, if he could. This implies that though everything will come to an end that day and such a tender plant would not be able to survive, it is still important to plant it, and that we should work right up to the last moment.

In the third tradition, it has been said that if a Muslim planted a tree and its fruits were eaten by other people, animals or birds, the man will get a reward continuing till Doomsday. This tradition also explains the previous one, that the man who plants a tree in this world and then nourishes it, God will plant a tree for him in Heaven, because when he plants it, other creatures of God eat its fruit and thus recieve benefits. Therefore God will repay him with a continuous reward, which will be the cause of his entering Heaven.

After the demise of the Holy Prophet (Peace be upon him), when the first Caliph, Abubakar Siddique (May God be pleased with him), sent the army already arranged by the Prophet, he urged that they should not cut or destroy the green shade and fruit bearing trees. After that, the second Caliph, Umar Farooq (may God be pleased with him), not only gave orders to establish irrigation systems and agriculture in the occupied territories, but he also ordered that tree crops should be established. This clearly implies that tree plantations and their protection have ever been the religious duty of Muslims and by the performance of which they have been earning glory in both this world and in the world to come.

Unfortunately, due to our lack of knowledge of the importance of trees and also to our negligence, we have eschewed this duty and consequently are now facing numerous difficulties due to an acute shortang of fuelwood, timber and timber products. To meet the demand we are having to import these comoditie and this uses up much of our hard-earned foriegn exchenge.

It must be remembered that Somalia's major economic resource is land, which is principally utilized for agriculture, forestry and range land. About 80% of the population (60% pastural nomads and 20% sedentary farmers) obtain their livelihood directly from the land. Out of a total land area of 63.8 million hecares, 8.8 million hecares are under different types of forests, representing about 13%, but in fact, the true forest area is less than 4% of the land area. The main products from the [illegible] are fuelwood, wood for charcoal, frankincense, myrrh, gum arabic and some medicinal

plants for local use.

Unfortunately, the standing volume of timber in the forest area is insufficient to meet our everyday demands for wood and wood products. So as mentioned earlier the country has to spend precious hard currency to buy these products. According to the data available for the year 1980, Somali Shillings 71, 597, 802 were spent importing wood and wood products. Now in 1984 if only the same quantities are imported we will have to spend around three times the amount i.e. 214, 793, 406 Somali Shillings, due to devaluation and higher prices, overseas. Somalia is a developing country and hence the demand for wood and wood products will continue to rise, which will pose great problems for the goverment as other commodities are also required in ever increasing amounts.

The solution lies with the people of Somalia who are quite capable of increasing the number of trees and forests through their own efforts. It is perhaps worth mentioning that economists have worked out that a country need about 20 to 25 per cent of its land area under trees, if the various needs for the nations prosperity are to be met. So therefore let us remember our duty to God and our country, by planting more trees each year and also by protecting exsisting trees to ensure that they reach maturity and provide maximum benefits to our nation. Our reward will then be waiting for us in Heaven.

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LETTERS TO THE EDITOR

SAVE THE SOMALI WILDLIFE

Through the Somali Range Bulletin I would like to bring, to the notice of Government authorities, general public and all those who are interested, few facts about the present condition of wildlife in Somalia.

Once we used to be proud of wild life in our country, they were in abundance but gradually the condition started deteriorating and from late 1979 the killing of wildlife became so common that today their number has reduced to minimum. If proper effective steps are not taken even their existance is in danger and some of the species will be become extinct.

One of the main cause for this large scale killing of wildlife is the uncontrolable ownership of shot guns and other types of fire arms by the people. Having these means the people kill wildlife for the following reasons:

1. They sell their claws, hides, horns, tusks to the rich traders, who receive big profits by exporting these items from the country.

2. Nomads kill some of the species for food and save their livestock for marketing. Thus not considering the value of the life created by almightly and ignoring a little respect what wildlife expect.

3. Sometime the farmers & nomads kill the wild animals just to disperse them from the grazing areas and drinking places they want to till and cultivates. It is worthwhile to mention here that the most prominently effected areas are Lower Juba, Middle Juba, Lower Shabelle and Middle Shabelle and to a lesser extent Hiraan and Sanaag regions.

Whatever efforts are made to-date it appear very difficult to control the killing of wildlife, unless the nomads are made to understand the greater benifits of preserving these most sought after wild-life and the Government put the project of saving wildlife on the top priority list of Development projects, like Agriculture, Livestock & Fisheries etc.

The concerned authorities must join hand seriously and undertake the important task of restoring safty to the wildlife. The object cannot be achieved if the responsibily

is not felt equally by all the groups responsible for the task and at the time of failure one group is accusing the other. Some responsible and reliable people should be given the task and they should only be accountable to the people and the Government. The responsible authorities concerned are especially the Ministry of Livestock, the Ministry of Tourism, the Somali police and National Range Agency. They must find a practical solution to this problem and encourage the rest of the people to respect the lives of these animals. The benefit of wild-life can be achieved more profitably and more products can be obtained if these are saved from indiscreminate killing aimed at destroying them. Not talking of the economic benefits, wild-life is a source of entertainment for us, an attaction for tourist, and help in the maintenance of the ecological & environmental balance in our country.

Yuusuf Mahamed Ahmed
Director, Wild-life Department,
National Range Agency.

BICIID & DABATAAG AT THE VERG OF EXCINCTION

The Somali Oryx belong to the same vareity as Arabian Oryx. It is greyish creamy with long and graceful horns. In a list puplished by the World Wildlife Fund Oryx catagorisee No. 3 in the five of the World's rarest mamals.

Oryx used to be common in many parts of Somalia, and very common in the Northern and Central areas. In the Eastern part of the Mudug Region in an area known as Joom Oryx used to be abundant, where huge flocks of Oryx used to roam. To my astonishment that in a short span of time the number of oryx decreased considerably. Really it made me sick and sorrowfull. Nothing quite extra-ordinary has struck Oryx from Heaven, but it is the indiscriminate hunting by the Somali Herders.

The data furnished by Mr. Funioli and Dr. Simonetta in 1966 gave geographical distribution of Oryx and other game in Somalia. But in many parts, marked by Mr. Simonetta and Mr. Funioli as the home of Oryx at that time, Oryx is rare. It has been hunted almost to the point of extinction.

Another antelope which I would like to bring to your notice is "Dabataag", Ammodorcas clarkei. The home of this antelope according to the data given by Simonetta and Funioli was mainly in the central parts of Somalia, but now it has also been greatly reduced and this antelpoe is also close to extinction point. Ammodorcas clarkei, is a very rare species only found in the Horn of Africa, mainly in Somalia. Now it is nearly extinct in the Northern areas

and small traces of it remain in the Central Region.

The Regional extention staff are doing their best to educate the people, so that this killing of the wildlife stops, but we need enough fuel to contact more people, and also audio-visual aics to make our work easy.

Programes conccerning the Wildlife should also be released from Mogadishu and Hargeiysa Radio Stations. Strong police action must be taxen and publisized so that the people know that killing Wildlife is a crime.

M. A. Geere
Range Extention Officer,
Mudug Region.

SOMALI ECOLOGICAL SOCIETY

On 1st October 1983, John Leefe and Michael Madany, with the encouragement of Dr. S.M.A. Kazmi, called a meeting in Mogadishu of all botanist, ecologists, foresters and range managers etc., who were interested in getting together to share their knowledge of the flora and fauna of Somalia. Fifteen persons, including the late John Maconochie attended the meeting and it was agreed to meet again on 1st December 1983.

At the second meeting, the title of Somali Ecological Society was adopted and Dr. Kazmi gave a short talk on the shrub Yicib (Cordeauxia edulis Hemsl.). 18 members attended.

The third meeting was held on 26th January 1984, when Alan Robinson, an expert on charcoal from the UK, gave and illustrated presentation on charcoal production in the Bay Region. John Jenks and Roger King followed this up with a talk, again illustrated, on the problems of regrowth of Acacia bussei and Acacia senegal, from which the charcoal is produced. Joe Dowhan, of the US Fisheries and Wildlife Service, concluded an interesting evening with a talk on his work in connection with endangered species of wildlife.

On Saturday 4th February, the Society held its first field excurtion, which took place at Balad. Bob Dauthwaite, NTTCP, was the leader for the first part of the excurtion to remnant of a reverine forest on the south bank of the Shebelli river. Omer Addan Warsame, Head of the Forest Operations Division, Forest Department, NRA took over for the second half and guided the party through the NRA forest nursery and irrigated plantations. 25 persons attended, including range Management Students from the faculty of

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Agriculture and Range Management.

The next meeting of the Society will be held, on thursday, March 8th at the National Herbarium. All members and new members are welcomed.

Johan D. Leefe,
Forestry and Wildlife Training Centre,
National range Agency, Mogadishu.

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N E W S

NATIONAL TREE PLANTATION DAY.

National Tree plantation day was observed on 17th April and inaugerated by the Minister of Livestock, Ranges and Forestry, Mohamed A. Nuur by planting a sapling at the premises of Hamar Bile in Wardhigley. All members of National Range Agency staff, representatives of Government Departments and Social Organisations were present. Speaking on the occasion the Minister briefly emphasised the importance of tree plantation spacially in the face of energy crisis in somalia. He said one of our biggest problem is the shortage of wood and charcoal on one hand, and desertification, which is the result of indiscriminate wood cutting, on the other hand. The problem can not be solved unless we grow more and more tree and create a balance between wood consumption and production. Such problems can not be solved unless the government and people join their efforts.

About 800,000 seedling raised at different NRA Nurseries all over the country were distributed to the Town Committees, Social Organisations and Individuals.

GENERAL MANAGER NRA VISITED KENYA AND USA

Dr. Abdullahi Ahmed Karaani, General Manager NRA attended seminar on public administration sponsored by US-AID at Washington. Later on accompanied by Mr. Baheldin, Coordinator, Central Range Develpoment Project, he visited Nairobi and discussed the progress made by CRDP during the last three years with the World Bank authorities at Nairobi.

NEW BUILDING FOR NRA HEADQUARTERS AND REGIONAL OFFICES

The Chinese contractors completed the construction of Regional Headquarters of the NRA at Bulo-Burti, Dusa-Mareb and Batet Weyne. Accompanied by the representative of the Chinese Economic Council General Manager visited the above Regional Headquarters and formally took over the charge of the new buildings. The construction of the NRA Headquarters at Mogadishu is at the final stages and it is hoped that the offices of NRA will shift in its new buildings in October 1984.

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ANNUAL INSPECTION TOURS

Director of Forestry Dr. Mohamed Mohamud Jumale visited the Lower Shabelle Region; Mr. Yusuf Ahmed Harare, Director Wildlife visited Lower Jubba; Mr. Mohamed Ahmed Ayan, Director Range Management visited Bay, Gedo and Bakool Regions; Mr. Mohamed Musa, Director of Planning and Trainning visited Nugaal, Togdheer and Western Regions and Mr. Ibrahim, Director of WFP, visited Bari and Sanaag Regions in the month of March to evaluate the progress made during 1983, to find out the difficulties faced by the NRA staff in performing their duties, and to solve the administrative problems in these regions. They submitted their reports to the General Manager.

The most encouraging was the information brought by Mr. Yusuf Harare from south that because of the transfers of some officials and punishment to the others by the Government, pouching has been reduced to none for the last few months.

INTERIM EVALUATION CUM APPRAISAL MISSION OF WFP

Interim evatuation cum appraisal Mission of WFP assisted project 719 Exp. "Rangeland Development", headed by Mr. Farid Oufle and other two members arrived in Mogadishu on 28.4.84. During its stay the Mission had discussions with the General Manager and staff of National Range Agency, staff of UNDP, US-AID and the officers of the Ministry of National Planning. The Mission also visited the sites of Irrigated Fuelwood Plantation Project and Sand Dune Fixation at shalambod, Coconut plantations at Merca, Nursaries at Janale, Balcad, Belet Weyne, and Farm reserves at Bulo-Burti. They also visited Tse Tse Control Project, Head Office at Mogadishu and different WFP-Aided Projects at Hargeisa, Berbera, Sheikh and Burao.

CRDP DONAR REVIEW MISSION

The Mission comprising of the representatives of US-AID, World Bank, IFAD, GTZ, WFP arrived Mogadishu on 18.3.84 to asses the progress made by the Central Range Development Project Project during the last three years.

Mr. Ayan Director Range Management accompanied them to all the three regions of the CRDP. Most of the field expatriates their counterparts also accompanied the group. Most of the sites, offices and other facilities were visited and difficulties were discussed. On their return they discussed the the problems with General Manager NRA, US-AID Authorities, Officer of the Ministery of Planning and other relevant official of the Government. Mission left Mogadishu on 4th. of April.

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RANGE MANAGEMENT PLAN FOR HOBBIO DISTRICT COMPLETED

Dr. James Naylor, Range Ecologist, CRDP., has completed the ecological surveys of Hobbio District (Approx. 25,000 sq. km.) and submitted a comprehensive report containing Range site and condition class maps and development plan for the seven range sites identified in district. All the relevant problems were discussed in details and solutions suggested.

NON-FORMAL EDUCATION

The first eleven non-formal education phamphlets were written, translated into Somali and printed and distributed throughout the three regions of the CRDP. It is encouraging that these publications proved to be a popular approach to the understanding of project objective. The pamphlets can be obtained from Non-formal Education (now the Extension) Department of CRDP. P.O. Box 1759, Mogadishu.

RANGE DEVELOPMENT SEMINAR/WORKSHOP

A Range Development Seminar/Workshop was organised by the Extention and Public Relation Component of CRDP. for Galgaduud Region in Ceel Dheer District. Thirty five Range Elders and other pastoral heads participated from each grazing degaan. Most of the CRDP field expatriate experts and their counterparts and OXFAM, took active part in the deliberations.

NRA STAFF PARTICIPATION IN INTERNATIONAL SEMINARS

Dr. Mohamed Mohamud Jumale, Director of Forest Department, NRA, left Mogadishu to attend THE Seminar on Fuelwood Plantation in Saline Lands, organised by UNSO and Government of Australia, Department of Agriculture at Perth commencing on 19th May, 1984.

NRA STAFF LEFT FOR TRAINING ABROAD

Mr. Abdi Ahmed Elmi, counterpart to the Professor of Range Management, Department of Botany and Range Management, Faculty of Agriculture, joined Utah State University for his Doctorate in Range Management early in 1984.

STUDY TOUR OF 10 FOREST OFFICER TO PAKISTAN

A study tour of 10 Somali foresters to Pakistan has been arranged and financed by US-AID. These forester, led by Mr. Kasmani of the Gedo Community Forestry Project, will visit Forestry Research Institute at Peshawar, scrub forests near Islamabad and the artificial forests near Lahore. They will also be shown the different important forest nurseries in the country, methods of soil conservation, and methods adapted to stop desertification in Sind and Baluchistan

areas and some minor forest industries in Lahore and Karachi. The group will leave in the first week of June for one month.

UNSO-FINNAID TECHNICAL MISSION

A Technical Mission sponsored by UNSO and the Government of Finland visited Somalia from 10th to 18th April 1984 to study a proposal for large irrigated fuelwood plantations in Mogadishi and Marka area.

UK FORESTRY ADVISOR VISITS NRA

Mr. W. J. Noward, Forestry advisor UK Government visited Somalia from 6th. to 13th. May to assess tne requirments of Forestry and Wildlife Training Centre at Afgoi, possibilities of financing a Project on Charcoal development, and to consider additional assistance to the Forest Department.

PLANNING ADVISER TO THE FOREST DEPARTMENT

Mr. Tom Kelly, Planning Adviser to NRA for planning and organising the Forest Departmentin arrived Somalia in Feb. 1983 under a US-AID project for one year, has submitted his report and left Mogadishu on 26 feb. 1984. Mr. Kelly in his report has rewiewed the progress of the Forest department in the past and made some proposals for the future.

FORESTRY TECHNICAL SEMINAR

A Technical Seminar on forestry was organised by the Forest Department of National Range Agency at Merka from 14th. to 15th. Jan. 1984. Most of the Forest Officers, Range Officers, and officer of the other relevant Government Departments participated. The technical aspects of development of forestry in Somalia were discussed. Mr. Bob Witherburn, Coordinator, Mr. Roger King, Forestry Adviser, Director of forestry and Assistant Directors were the main speakers.

SAND DUNE FIXATION

Mr. Fagotto arrived Mogadishu on 20 Dec. 1983 under UNSO sponsorship to review the sand dune fixation project for Shalambood.

An other team of Chinese Experts visited Somalia from 8 Nov. 1983 to 6 Jan. 1984 to collect preliminary information and to assess the requirments needed for soonsoring a sand dune fixation project by Chinese Government.

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CHARCOAL DEVELOPMENT

Mr. Alan Robinson of the British Tropical Institute spent about three months on the study of indigenous methods of charcoal production and the indigenous resources available in the country, and how these can be imoroved. A report from Mr. Robinson is expected in near future.

Mr. Ermich has also been working on development of low price but more efficiant kiln for Somalia under UNIDO assistance. Mr. Ermich is again in Somalia along with the raw material and planning to construct few demonstration kilns in Bay region.

GRADUATES FROM BURAO RANGE SCHOOL

40 students will be graduating from school of Range Management and Forestry, Burao, after successfully completing their two and half years course on Range Management and Forestry. After formal graduation from the school and prior to their posting to the different regions they will be sent to undertake a three month course in adminitration at the Police Trainning School.

AGRI-STUDIO COMPLETED THEIR SURVEY OF 21 WILDLIFE RESERVES

Dr. Agrelli of the Agri-studio, contractors for surveying of the wildlife in Somalia completed the surveys of the last two regions of Lower Shabeele and Lower Jubba with Mr. Qabile of the wildlife department. Now the surveys of the 21 reserves all over the country are complete and the final report is expected in near future.

LIGISLATION ON WILDLIFE

Mr. Edwards F. Toth visited Somalia on deputation from US forest Department for a period of six weeks to assist the wildlife Department in formulating ligislation, organisation and program opportunities for the Department.

NEW APPOINTMENTS

Mr. U. L. Davis has been appointed as technical director of planning. He will be working in collaboration with Mr. Mohamed Musa, Director planning NRA. He arrived Mogadishu in March 1984.

Mr. Mazhar Ali Kasmani, formerly of the Foresty and Wildlife Training Centre, Afgoi, has been appointed as Projet Technical Adviser to the Community Forest Development Project, Gedo. The project is financed by USAID.

The following appointments were made in the forest

Department under the revised organisation:

Mr. Abdirahman Mohamed Ali, Head, Division of Land Management.
Mr. Omar Adow Warsame, Head, Division of Operations (Silviculture)
Mr. Ahmed Hassan Ofle, Head, Division of Field Operations
Miss Berlin Abdi Mohamed, Head, Division of Planning and Records.

BEE KEEPING AND FOREST NURSARY DEVELOPMNT SEMINARS

A short Seminar on Bee keeping and honey production will be held at Mogadishu under the collaboration of Government of the Somalia and FAO. 20 participants are expected to attend the Seminar.

Another Seminar has been organised at Mogadishu for 30 participants on the techniques of developing forest nursaries.

NATIONAL HERBARIUM

Dr. S.M.A. Kazmi, Mr. Mohamed Musa and Mr. Hussein Hassan collected about 400 palnt specimens from Sanaag, Bari, Nugaal and some parts of Mudug regions in late 1983.

Duplicates of the plants collected by J. B. Billett and Hemming from the southern part of Somalia under the land survey project, carried on by Resource Management and Research, have been recieved at the National Herbarium.

Duplicates of 150 plant specimens collected from different parts of Africa were sent in exchange to the National Herbarium by Tropical Herbarium Florence.

Mr. Abukar Sheikh Abdirahman left on four months leave on March 1, 1984.

Miss Istanbul Hagi Abdisamad has been selected to a one year training followship in Plant Taxonomy at the Tropical Herbarium Florence. She is expected to leave florence shortly.

Miss Maryann Isse, returned from one month leave early May 1984.

Miss Saida Mohamed Sheikh left on four months leave on Feb. 1, 1984.

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NRA DECUMENTATION CENTRE

An Apple II Computer and a word processer has been installed at the Decumintation Centre, attached to the National Herbarium. Mr. Musa and Faduma (Zam-zam) of the National Herbarium are being trained to use this facility.