

## Land

The data and maps presented in this section describe the land resources of the three geographical areas of interest (AOI) of the SWALIM project to date (Figure 1). They are located in the northwestern, northeastern and southern part of the country. However, most of the data now available were collected from the northwestern and southern AOI. For the northeastern AOI, only land cover and herbaceous biomass data are presented.

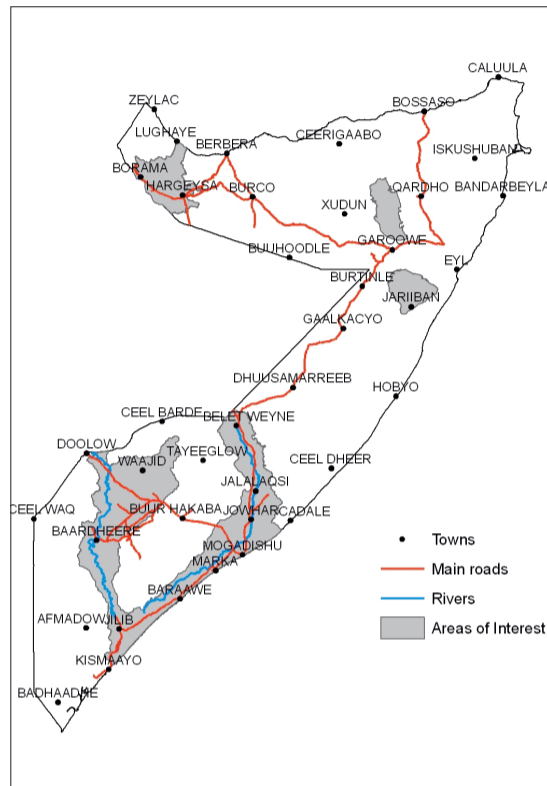


Figure 1: Areas of Interest

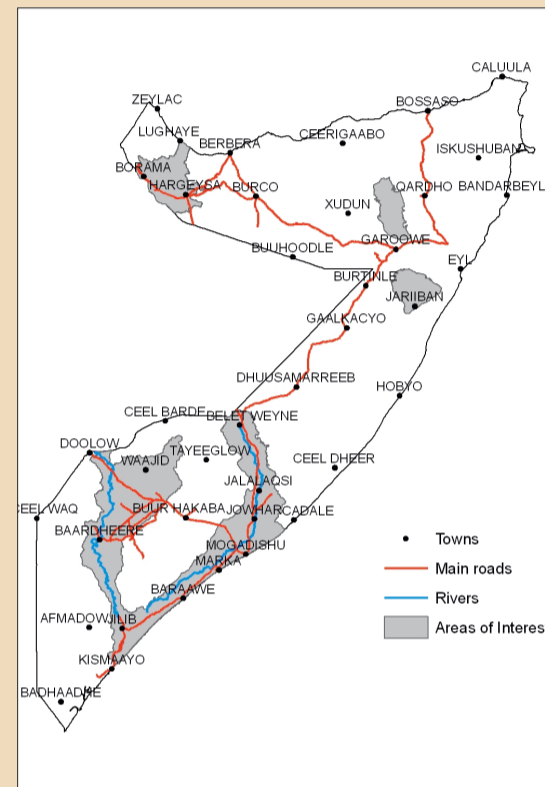
The country has a rock backbone made up mainly of sedimentary rocks (limestone, sandstone and evaporitic rocks), while very old metamorphic and more recent volcanic rocks outcrop only in limited areas of the country (see maps on pages 95 to 98). The northwestern AOI is characterised by a generally very rugged morphology. Coastal plains facing the Gulf of Aden, highlands up to more than 2,000 meters above sea level, plateaux, and escarpments are the main features. A very dense, even if ephemeral, drainage network cuts deep gorges into the mountain chain and crisscrosses the plateaux and highlands. Tectonic faults, some parallel to the coastline and others of more complex patterns, also contribute to the gorge formation. The southern AOI shows a more gently undulating morphology, with smoothed hills and wide alluvial plains in the inner part of the AOI, enclosed by a huge sand dune system running along the coastal plains facing the Indian Ocean. Here the only two perennial rivers of the country sweep across their plains, flooding them relatively regularly. A system of buried faults runs parallel to the coast (see maps on pages 99 to 103).

Eight different soil groups are found in the Northwestern AOI: Vertisols, Leptosols, Regosols, Calcisols, Fluvisols, Arenosols, Cambisols and Solonchaks. The dominant soils are the Leptosols and Regosols, followed by the Arenosols and Solonchacks. Soil erosion, mainly due to water and wind, is the main problem affecting the topsoil of this study area.

Sheet, rill and gully erosion forms are present at different severity levels, caused mainly by overgrazing, tree cutting for charcoal production, and construction of water points (see map on pages 107). Soil erosion problems as observed in the field and according to land users, can be attributed to natural conditions and to land mismanagement, especially increased levels of livestock grazing (overstocking), increases in numbers of water points (hand-wells, boreholes and underground water reservoirs or berkado), increasing devegetation (tree cutting, forage cutting) and some water harvesting techniques applied in agricultural areas.

## Dhulka

Macluumaadka iyo khariidada qaybtan lagu soo bandhigay waxa ay faahfaahin ka bixinayaan khayraadka dhulka ee sadex aag oo ay SWALIM u kuur gashay (fiiri shaxda 1aad) meelahani waxay ku yaalaan Waqooyi Galbeed, Waqooyi Bari iyo koofurta dalka. Si kastaba ha ahaatee macluumaadka ugu badan waxaa laga soo ururuyay Waqooyi Galbeed iyo Koofurta, aagga Waqooyi Bari waxaa xogta waxay kooban tahay oo kaliya arrimaha la xiriira huuga (dahaarka) dhulka iyo dhirta yaryar kulligeed.



Muuqaal 1: Meelaha La Danaynayo

Wadanka waxaa laf dhabar u ah dhagaxyo lakabyo ah mamac, didib iyo kuwo (nooca nuuriyada laga sameeyo, kuwo ciid ah iyo dhagxaan isbadal ku dhacay). Halka dhagaxyada qadiimka (metamorphic) iyo kuwo dambe oo ah dhagaxyo folkaano oo ka soo dibad baxay ama laga helaa meelo xadidan oo dalka ah ( fiiri khariidada bogagga 95-98)

Aagga gobolka waqooyi galbeed ee ay SWALIM u kuur gashay waa mid guud ahaan leh buuro qara weyn. Muuqaalada ugu

muhiimsan ee aaggani waxay isugu jiraan gubanta xeebta ee ku teedsan Gacanka Cadmeed, buuraley dhererkeedu ka sarreeyo heerka badda ilaa 2000 mitir, banaanno iyo qarar. Waxyaalaha kaalinta ku leh samaysanka laagaha biyo mareenka ah waxaa ka mid ah rastooyinka dhulka tararka u dhexeeya oo qaarkood ku dherersan yihiin badda qaarkoodna ay yihiin sidii koox oo kale.

Aagga koofurta ee ay SWALIM u kuur gashay waxaa uu muujinayaa muuqaal dari iyo god ah kaasoo gudaha ku leh haaro qurxoon iyo carro deg ballaaran (alluvial plains) waxaana aaggan lifaaqan bacad fara badan oo ku teedsan badweynta Hindiya. Aaggan waxaa ku yaala labada wabi joogtada ah ee waddanka kuwaasoo dhexmara dhul banana ah oo ay la xiriiraan fatahaado badan oo soo noqnoqda. Xeebta waxaa barbar socda nidaam tarar xabaalan oo (fiiri khariidada ku taal bogagga 99 ilaa 103).

Aagga waqooyi galbeed ee la darsayey waxaa laga helay 8 nooc carro oo kala geddisan kuwaasoo kala ah: vertisols, leptosols, Regosols, Calcisols, Fluvisols, Arenosols, Cambisols, iyo Solonchaks. Noocyada ugu badan ee carada waxaa weeye leptosols iyo Regosols waxaana ku xiga Arenosols iyo Solonchaks. Sida lagu ogaaday ama laga fahmay daraasaddan dhibaataada ugu weyn ee haysata ciida sare waa ciid-hallow waxaana sabab u ah biyaha iyo dabaysha.

Waxaa jira noocyo ciid-hallow oo leh heer haliseed kala duwan, waxaana sabab u ah daaqis xad-dhaaf ah ah, geedaha oo loo jaro in laga dhaliyo dhuxul iyo in wax dhisitaanka meelaha biyaha la helo. Dhibaatooyinka

Eleven different soil groups are present in the southern AOI: Leptosols, Vertisols, Fluvisols, Solonetz, Solonchaks, Gypsisols, Calcisols, Arenosols, Cambisols, Regosols and Technosols. This AOI is much more heterogeneous in terms of soil distribution, giving rise to opportunities for differentiating land use. The upper Juba and Shabelle areas are quite similar in terms of soil formation. As the rivers progress downstream, they are both distinguishable with the presence of Fluvisols and Vertisols. Further away from the river valleys, the study area has small hilly areas showing Leptosols and Regosols, these latter presenting physical limitations for agriculture purposes.

The middle part of the Shabelle river valley is characterised by wide flat alluvial plains with more developed soils (Vertisols, Luvisols, Cambisols). The Lower Shabelle river valley has many different soil groups (Vertisols, Calcisols, Gleysols, Solonets, Arenosols, Cambisols and Fluvisols), almost all being moderately to poorly drained. Although some of the Vertisols, Cambisols, Fluvisols and Calcisols have good soil properties for agriculture purposes, regular flooding may influence their exploitation.

The middle Juba river valley is composed of very productive Vertisols and Calcisols. The Lower Juba, being another area prone to floods, is characterised by grey Vertisols, Stagnosols, Fluvisols, Solonchaks, Solonetz and Arenosols. The soils in this area have strong limitations for agricultural activities, mainly due to poor drainage and salinity.

The sandy dunes of the coastal area are made of Arenosols. The soils close to the coast are pure loose marine sand, while the soils facing the Shabelle river valley are more developed. These soils are not useful for agricultural purposes (see maps on pages 104 to 105)

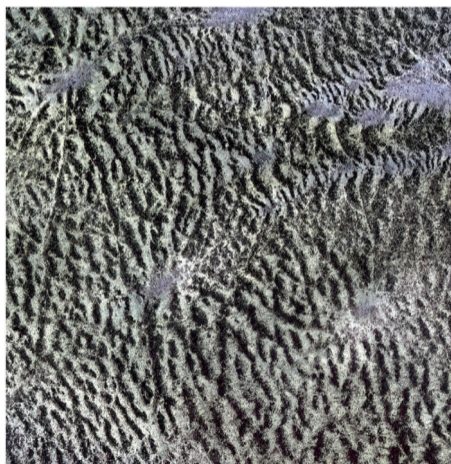


Figure 2: example of Tiger Bush pattern. The dark stripes are vegetated; the lighter ones are bare soil.

Land cover in the northwestern AOI is characterized by natural vegetation on 83% of the surface, with rangeland vegetation types being predominant. The rest of the AOI has a land cover of wooded vegetation and agriculture, and a small portion where it is possible to find non-vegetated areas. Savannah with sparse shrubs, occasionally in association with sparse trees, forms the greater part of the rangelands, with very limited pure grassland areas. The wooded vegetation present in the AOI is composed almost equally of general open formations of shrubland and woodland, with a primary tree layer, with or without shrubs and very open trees with shrubs laid out in a tiger bush pattern (figure 2). Tiger bush can display an interrupted cover of either striped or cellular fragmentation. Degraded types have a cellular pattern. The most widespread agricultural practice is rainfed agriculture (>90%) where crop establishment and development are completely dependent on rainfall. Irrigated cultivation occupies less than 10% of the mapped area. The rainfed agriculture is typically practiced in fields of small dimensions (<2ha) growing cereals. Maize and sorghum are the most important crops, and are cultivated either as single crops or in combination. Depending on rainfall, the same crop

ciid-hallowga sida lagu arkay dhulka la sahmiyey iyo xogta laga helay dadka isticmaala dhulka, waxaa loo tiirinayaa xaalad dabiicadeed iyo dhul maarayn khaldan, gaar ahaan kororka joogto ah ee xoolaha dhulka daaqaya (daaq xaalufin), kororka tiro ee meelaha biyaha laga helo (ceelasha gacan-qodaalka, ceelasha riigga iyo barkado), kororka dhir jaridda (geedo goynta, daaq jaridda) iyo qaab farsamo biyo qabasho oo loo adeegsado dhul-beereedyada.

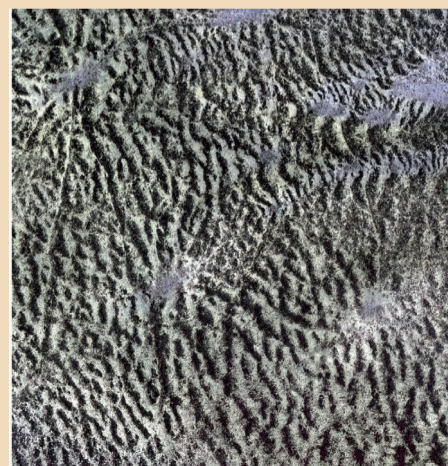
Aagga koofurta ee ay SWALIM u kuur gashay waxaa ka jira 11 nooc oo carro kuwaasoo kala ah: Leptosols, Vertisols, Fluvisols, Solonetz, Solonchaks, Gypsisols, Calcisols, Arenosols, Cambisols, Regosols iyo Technosols. Inta badan ciidda aagga waa mid kala geddisan taasoo keenaysa in loo isticmaalo siyaabo kala duwan. Jubbada Sare iyo Shabeelle ciid ahaan way isu egyihiin xagga samaysanka. Markasta oo ay Wabiyadu soo hoos u sii socdaan (xagga badda) waxaa ciidda loo kala saari karaa nooca Fluvisols iyo Vertisols. Meelaha ka durugan dooxada wabiyada waxaa ka jira buuro yaryar oo leh noocyada ciidda ah Leptosols iyo Regosols, noocyadan waxay xannib ku yihiin (ama reebayaan) hanaanka beer falashada.

Qaybta dhexe ee dooxada wabiga shabeelle waxay ku tilmaaman tahay dhul ballaaran oo dhoobey siman ah waxayna leedahay carro hormariyey (Vertisols, Luvisols, iyo Cambisols). Qaybta hoose ee dooxada wabi shabeelle waxay leedahay noocyo carro gaybo badan oo kala geddisan (Vertisols, Calcisols, Gleysols, Solonetz, Arenosols, Cambisols iyo Fluvisols) waana noocyo intooda badan ay biyosocodiintooda hoose ay dhexdhexaad tahay ama liidato.

Inkastoo noocyada qaar sida Vertisols, Cambisols, Fluvisols iyo Calcisols ay leeyihiin tayo ciideed oo ku habboon beerashada, daadadka joogtada ah waxay saamayn ku yeeshaan ka waxsoosaarkooda

Bartamaha dooxada Wabiga Jubba waxa uu leeyahay noocyada Vertisols iyo Calcisols oo aad wax soosaar u leh. Jubbada Hoose oo ah degaan u nugul fatahaada waxaa laga helaa noocyada Vertisols-ka bayga ah, Stagnosols, Fluvisols, Solonchaks, Solonets iyo Arenosols. Noocyada carrooyinka ee aaggaan Jubba hoose waxay dhibaato xoog leh u leeyihiin hawlaha beer falashada, sababta ugu weynna ay tahay ciidda oo aan biyaha hoos u socodsiinayan iyo iyada oo cusbooley ah.

Bacaadka ku teedsan aagga xeebta waa Arenosols. Carrada xeebta u dhaw waa carro badeed bataax ah, halka ciiddaha Wabiga Shabeelle ay yihiin kuwo si badan hormariyey. Noocyadan carrooyinkan kuma habboona beerashada (fiiri khariidada bogagga 104-105).



Muuqaal 2: Tusaaleha Cayn Kayn Shabeel. Diilimaha Madow Waa Geedo; Kuwo Ifiimaya Waa Ciid Qaawan

Huuga dhulka aagga Waqooyi Galbeed ee ay SWALIM uu kuur gashay wuxuu leeyahay dhir dabiici ah oo ku baahsan ilaa 83% deegaankaas, waxaana ku badan dhirta noocyada dhulka daaqinka. Inta soo hartay waxaa ku yaal geedo jirid weyn ah iyo beero, iyo qayb yar oo aan wax dhir ah lagu arag. Dhir raamo ah oo ay weheliso geed gaab teel-teel ah (Safaanaha) ayaa ugu badan dhulka daaqinka, waxaana ku yar daaqinka cawska soocan leh. Aagga

(maize – maize) or two different crops (maize – sorghum) can be cultivated sequentially, i.e. in sequence on the same field within one year. Rainfed fields of shrub crops are also present (*Catha edulis* – Qaat).

The greater part of the southern AOI is covered by natural vegetation (74%) even if only a small portion of it is made up of dense vegetation, and a smaller proportion, but still large in area, is occupied by cultivated areas. Within the natural vegetation cover, a large part is composed by wooded vegetation (65%) while only a small one is composed of rangelands (9%). The remaining is covered by non-vegetated areas (see maps on pages 108 to 113).

The land use in the northwestern AOI involves crop production that entirely relies on rainfall, and is practiced around the southern parts of Gebiley, Borama and Hargeisa. Given that rainfall in the study area is low (about 400mm in average per year), this land use class is characterised by water harvesting (surface dams, soil bounding and berkedes) as improvement systems associated with it. The water from the berkedes and surface dams is also suitable for domestic and animal use. The most common crops in this area are maize and sorghum, with others being qat (miraa), millet and cowpea. In the Dur Dur and Gebiley Valley area, rainfed agriculture as a land use class can be classified into two categories: low-input and medium-input. Input here refers to material input such as seeds, fertilizer, pesticides, etc.

In the Southern AOI, twelve verified classes of land use have been identified and mapped, most based on a combination of one or more of the main land uses of transhumance pastoralism, rainfed and irrigated agriculture, and wood collection (see maps on pages 114 to 116).

The Land Suitability of the two AOI has been analysed on a qualitative basis that leads to some recommendations for the major land uses, i.e. rainfed agriculture, irrigated agriculture, pastoralism and forestry.

The northwestern AOI is (moderately) suitable for rainfed crops only in the plateau area with relatively high rainfall. The areas suitable for irrigated agriculture are estimated at slightly over 10,000 ha. Although a more detailed study is needed, it is likely that most land suited to irrigated agriculture is already in use, and that future development of irrigated agriculture should focus on improved management rather than expansion. Not much difference was found in the suitability for cattle, camels and sheep, because of overriding limitations such as low biomass production, and steep slopes with shallow or stony soils. The suitability for goats is slightly better, as they can also access steep slopes. For nearly every environment, a tree species can be found that will survive, particularly if it is well looked after during the first year after planting.

In the southern AOI, a land suitability assessment has also been produced for the same four major land uses. The Southern AOI has no land which is very suitable for cowpea, cotton, maize or sorghum (the four studied rainfed crops). This is mainly due to the high rainfall variability (both seasonal and annual), flooding hazard, low soil fertility (alkaline soils) and/or high soda content in the soil, although some of these limitations can be overcome. Roughly 10 to 25% of the study area is moderately suitable (class S2) for one or all of the four crops analyzed. Around 35% of the study area is unsuitable (class N) for all four Land Utilization Types (LUTs), and almost 55% is unsuitable for maize (Rm1). This part of the country has a long history

kaymaha waaweyn leh ee la daraaseeyay waa mid leh geedo waaweyn mararna wata geed-gaab, oo geedaha dhaadheer door yihiin, waxay ahaan karaan kuwo leh ama aan lahay geed-gaab iyo geed-dheer aad u kala fog oo weheliyaan safsaf geed-gaab ah oo muuqaal daliigo ah leh (Tiger bush) sida ku cad (Sawirka 2). Geedaha gaar ahaan nooca loo yaqaan tiger bush waxay daboolaan aag balaaran ayagoo aan kala go'lahayn si daliigo ah ama goobo kala tagtagsan. Meelaha xaalufku saameeyey ayaa leh gaab kala tagtagsan.

Qaabka ugu badan ee ay dadku wax u beertaan waa midka ay dadku ku tiirsan roobka (>90%) habkan nidaamka mira abuurka iyo hormarka beerhuba wuxuu ku tiirsan yahay dhammaantii roobka cirka. Nidaamka beerashada ee ku tiirsan waraabka waa in ka yar 10% ee deegaanada la khariidadeeyay. Beerashada roob ku beerashada waxaa looga faa'iidaystaa beero aan waaweynayn (<2ha) oo ah deleyada miraha xabuubka. Galleyda iyo masago (haruur) waa miraha ugu muhimad badan ee la beerto, waxaana loo beeraa ayagoo isku dhaf ah ama si gooni gooni ah. Iyadoo lagu tiirsan yahay roobka ayaa labadan dalag loo beeraa is isku xigxigta (gallay-gallay) I ama si laba dalag oo gooni gooni ah (gallay- masago), tusaale ahaan isla hal beer si isku xigxigta isku hal sano gudaheed. Beero geed-gaab roob lagu beertana waa jiraan sida (*Catha edulis*-Qaat).

Qaybta ugu badan ee deegaanka koofurta oo ay SWALIM darastay waa deegaan ay ku badan tahay dhir dabiici ah (74%), qayb yar oo ka mid ah ayaa ah dhir aad isugu dhaw-dhaw, sida kale qayb yar, laakiinweli ah bed ballaaran, ayaa ah dhul la beerto. Huuga dhirta dabiiciga ah ma la eego, qayb ballaaran waxay tahay dhir dhaadheer (65%), halka in yar oo kaliya ah ay tahay dhul daaqsin ah (9%). Inta hartay waa dhul aan lahayn dhir (**fiiri khariidadaha bogagga 108-113**). Isticmaalka dhulka ee gobolka waqooyi galbeed ee ay SWALIM darastay waxaa ku cad in nidaamka beerashadu ku tiirsan yahay roobka caadiga ah waxaana aad looga isticmaala agagaaraha qaybaha koofureed ee Gabilay, Boorama iyo Hargeysa. Maadaama di'itaanka roobka ee deegaanadan uu yahay mid hooseeya (qiyaas ahaan 400mm celceliska sanadkii), ayaa waxaa qaybtaan la sameeyaa in la xiro biyaha (biyo xireeno, ciid moosid dhan la godo iyo barkado) sidaas baana ku haboon baa la qabaa beerashada. Biyaha lagu kaydiyo barkadaha iyo balliyada waa kuwo ku habboon dadka iyo xoolaba inay isticmaalaan. Miraha dalagyada ugu badan ee deegaanadan laga beerto waa galley iyo masago, meelaha qaarna waxaa weheliya qaadka (*Catha edulis*), moordi iyo digir. Deegaanada dooxada Dur-Dur iyo Gebiley nidaamka isticmaalka dhulka waxaa loo qaybnin karaa laba qaybood: mid farsamada waxgelintu hoosayso iyo mid waxgelintu ay dhex-dhexaad tahay. Waxgelinta halkaan waxaa loola jeedaa agabka la geliyo ama loo adeegsado beeraha sida abuurka, bacriminta iyo sunta cayayaanka la isticmaalo iwm.

Deegaanada koofurta ee ay SWALIM darastay waxaa la sugay ogaaday inay ka jiraan 12 qaab oo isticmaal dhul oo khariidad lagu muujiyay, qaybaha isticmaalka dhulka intooda badana waxay ka kooban yihiin qaababka isugu jira hal iyo ka badan isticmaal dhuleed oo ah daaqasho reer guuraa, roobka iyo waraabka ku beerasho, iyo dhirta jaridda (**fiiri khariidadaha bogagga 114 ilaa 116**).

Falanqenta ku saabsan habboonaanta dhulka ee labada deegaan waxaa lagu saleeyay tayada taasoo muujinaysa talooyin lagu soo jeedinayo habka isticmaalka dhulka sida roob ku-beerashada, waraab ku-beerashada, xoolo dhaqashada iyo kaymaha.

Deegaanka la darsay ee waqooyi galbeed waxaa uu ku habboon yahay (dhexdhexaad ahaan) miraha roob ku-waraabka caadi ah gaar ahaan dhulka

of irrigated agriculture on the alluvial plains of the Juba and Shabelle rivers. In 1980, about 50,000 ha were under controlled irrigation and 110,000 ha under flood irrigation. Although there is very little land that has been classified as highly suitable for rice, citrus and sugarcane (the three species studied) moderately suitable land is quite widespread: about 180,000 ha for citrus, 92,000 ha for paddy rice and 667,000 ha for sugarcane. Agricultural productivity on the alluvial plains is limited by the presence of very alkaline soils (pH >8.5), soils high in sodium (exchangeable sodium of > 40%) and/or high salinity (electric conductivity of > 12 dS/m). Four types of grazing have been considered: cattle (Pc), camels (Pd), goats (Pg) and sheep (Ps). Evaluating land for its suitability for pastoralism is somewhat complicated because pastoralists move the livestock over large areas and do not confine themselves to specific places. No land was identified as highly suitable for any of the four types of grazing. For camels, goats and sheep, slightly over 50% of the area is moderately suitable and most of the remaining part marginally suitable. For cattle, more land is marginally suitable (60%) than moderately suitable (38%). As compared to camels, goats and sheep, bovines are more sensitive to rough terrain and do not easily access steep slopes and/or stony and rocky areas. The areas most suitable for cattle (class S2) are the extensive alluvial plains of the Shabelle and lower Juba, as well as the gently sloping upland plains of the northeastern Juba catchment (see maps on pages 117 to 146).

oogada (plateau) ee roobkiisu fiican yahay. Deegaanka dhulka ku haboon beerashada waraabka ku saleysan waxaa lagu qiyaasi karaa in wax yar uun ka badan 10,000 ha. Inkastoo loo baahan yahay daraasad qoto dheer, haddana waxaa muuqata in inta badan dhulka ku haboon beerashada waraabka ayan hada meeli ka banaaneyn oo la wada isticmaalo, sidoo kale haddii la rabo hormarka mustaqbalka wax ku-beerashada waraabka in loo jeesto in la wanaajiyo oo la habeeyo hanaanka maamulka halkii laga sii ballaarin lahaa. Ku habboonaanta noocyada xoolaha kala duwan ee dhulkan waxaa la oran karaa ma laha farqi weyn oo si isku mid ah ayaa loogu dhaqi karaa lo'da, geela iyo idaha, waxaana caqabad ka imaan kartaa qadarta doogga la heli karo, iyo jirirada buuraha leh carro aan dhumuc yar ama ciid dhagxaan leh (qalax). Ku habboonaanta ari-cadka ayaa la dhihi waa yara wanaagsan yahay, maadaama ay gali karaa jirirada buuraha. Qaaliban deegaan kasta, nooc geed baa laga heli karaa oo ku noolaan kara, gaar ahaan haddii si wanaagsan loo dhawro markii la beero suridda ka dib sanadda koowaad inta lagu jiro.

Deegaanka koofurta ee ay SWALIM darastay, waxaa qiimayn lagu sameeyey dhulka wax habboonaanshihiisa oo isla afarta isticmaal dhuleedka qaalibka ah. Koofurta ma laha dhul aad ugu haboon beerashada digirta, suufka (cudbiga), galleeyda, masagada (afarta nooc ee dalagyada roobka lagu beerto). Waxaa arrintan sabab u ah iyadoo ay jirto heerka roobka di'itaankiisa oo kala duwan (xilli ahaan iyo sannad ahaan labadaba), halista fatahaadda, liidashada bacrinta ciida (ciida alkaline ah) iyo/ama ciida oo dhanaan badan leh, incastoo qaar ka mid ah dhibaatooyinka la xallin karo. Qiyaas ahaan 10- 25% deegaanka daraasada lagu sameeyay waa ilaa heer dhexe waa ku haboon yahay mid ah ama afarta nooc ee dalagyada la darsay (class S2). Qiyaas ahaan 35% deegaanka daraasadda lagu sameeyay kuma habboona dhammaan afarta nooc ee loogu talo galay isticmaalka dhulka (class N), sidoo kale qiyaas ahaan 55% kuma habboona beerashada galleyda (Rm1). Aagga dhulka dhoobayda ah ee ku yaal daafaha wabiyada Jubba iyo shabeelle waa mid leh taariikh fog oo waraab ku-beerasho. Sannadkii 1980kii dhul qiyaastiisu tahay 50,000 ha ayaa wuxuu ahaa mid loo adeegsado waraab ku-beerasho xakamaysan iyo 110,000 ha oo ahaa mid ay daadad ku-waraab. Inkastoo uuna jiro aag dhul yar oo lagu abla-ableeyey inuu uu heer sare ugu haboon beerashada bariiska, liinta iyo qasabka (saddexda dalag ee darsay weeye), hadana qaybta dhulka dhexdhexaad ahaan wanaagsan waa ay baaxad weyntahat qiyaastii ilaa 180,000 ha baa ku haboon beerista liinta, halka ay 92,000 ha ku habboontahay bariiska biyo fariisiga lagu beero, iyo 667,000 ha oo ku haboon beerashada qasabka. Waxsoosaarka beeraha ee deegaanada dhoobayda ah waxaa xannibaad ku ah jiritaanka ciida aad alkaline u ah (ph>8.5), iyo ciida ay jirto soodiyam farabadan (exchangeable soodiyam >40%) iyo/ama ciid aad u dhanaan (Electric conductivity of >12dS/m). Waxaa la tixgeliyey afar nooc oo xoolo daaq: lo' (Pc), geel (Pd), riyo (Pg) iyo (ido Ps). Odoroska ku habboonaanta ciid ay ku haboon tahay xoolo daaqa ha waa arrin dhib badan maxaa yeelay xoolo dhaaqsatadu dhul ballaaran ayay mar walba xoolahooda meel cusub ula guuraan oo kuma koobna meel gaar ahneed. Ma jirto dhul meel ku gaar ah oo loo aqoonsaday inuu aad ugu haboon yahay nooc xoolo gaar ah oo ka tirsan afarta qaybood ee daaqda ka mid ah. Geela, ariga iyo idaha in wax yar ka badan 50% ayaa ku haboon daaqista meelaha dmeelaha kalana way ku yara haboonaan karaan daaqistooda. Lo'da si yar ugu haboon dhul qiyaastii ilaa 60%, si dhexdhexaad ahaanna ilaa (38%). Haddii loo eego geela, ariga iyo idaha, lo'da aad bay nugushahay dhul galafsan oo welibana ma mari karto jirirada janjeerada iyo/ ama meelaha qalaxa iyo jaballada leh. Dhulka aadka ugu haboon lo'da waa (class S2) waa dhulka siman oo baaxadda leh daafaha Shabeelle iyo Jubbada Hoose, sidoo kale dhulka aan aad janjeerin ee banaanada yara kacsan ee ku yaal waqooyi bari ee biyo celiska Jubba (**fiiri khariidada ku yaal bogagga 117-146**).