

Reader's guide

This Atlas presents maps and data of the two perennial rivers of south Somalia and their catchments. From their upper reaches in Ethiopia, the Juba and Shabelle Rivers flow south-east into the Somali territory, and continue until they empty into the Indian Ocean. Their drainage basins cover all of southern Somalia, most of eastern Ethiopia, as well as a large part of north-eastern Kenya.

SWALIM has been collecting data on the two river basins for about five years, and now, following the digital aerial photography survey conducted in January- February 2008, is ready to provide new and deeper insights into these territories.

The Atlas is divided into three parts. Part One presents the whole river basin: pages 2-15 show land, drainage and climatic features over the entire extent of the Juba-Shabelle transboundary river basin, while pages 16-26 narrow in on the Somali part of the basin. The first set of maps is derived from regional and world datasets such as FAOclim, which contains climate data from an extensive global network of meteorological stations; the NASA SRTM 90 m Digital Elevation Model (DEM); and the SOTER dataset on soil and geology. The maps of the Somali part of the basin are based on information directly produced by SWALIM over the last five years, either from existing data recovered by SWALIM or from newly collected data. For newly collected data, due to insufficient resources SWALIM was unable to cover the entire country, and therefore targeted smaller 'Areas of Interest', selected on the basis of economic importance. The river corridors described below constitute SWALIM's main Area of Interest in southern Somalia. On the other hand, pre-war data that SWALIM was able to recover, are generally nationwide in scope. For example, the relief and land cover maps (pages 20 and 21 respectively), which are based on data collected in field work by SWALIM, cover only the Area of Interest, while other maps, such as the Land Use Systems map (page 24), draw on existing data supplemented by SWALIM refinements and cover a larger area. All maps of this section were prepared in a geographic projection system with coordinates in degrees. Each map has a reference code. Readers interested in obtaining digital copies (in shape file format) of these maps can contact SWALIM at enquiries@faoswalim.org.

Part Two and Three present the Shabelle and Juba Rivers respectively. These parts are based principally on the results of the digital aerial photographic survey, which produced digital aerial photos, both visible and infrared, and a detailed Digital Terrain Model (DTM). In the upper portion of both rivers (in green, Figure on page xv), the resolution of the aerial photos gives a horizontal accuracy of 50 cm, and the DTM ensures 50 cm of vertical accuracy. In the lower reaches (in orange, Figure on page xv), both horizontal and vertical accuracy is within 25 cm. A total of approximately 8 840 km² (3 680 km² on the Juba River and 5 160 km² on the Shabelle) is covered by the aerial photography.

The yield from this extremely high resolution dataset is tremendously large. As such they could not all fit into this Atlas, even if it were ten times larger. The emphasis in this part, then, is two-fold: 1) to describe the general features of rivers, and 2) to present, by way of examples, techniques of using the data at very large scale, and their application to a variety of pursuits.

Part Two presents the Shabelle corridor in eight sections, from the Ethiopian border to the southern end, where the river disappears into a marsh. From this point further down to the junction with the Juba River (the Shabelle actually flows into the Juba, but only during times of high flow) there is no coverage, as there are practically no settlements or irrigation schemes. Each section is named after the main town (usually a district capital) located within the given area. The Juba corridor in Part Three follows likewise in four sections, with continuous coverage from the Ethiopian border down to the river mouth.

To help orient the reader through the sections of the river corridor, each section begins with an orientation page (see for example page 28) which presents an overview of that section.

As a general approach, the orientation page includes an insert of a Somalia map showing the location of the section along the Juba or Shabelle Rivers

Hagaha aqristaha

Buugga xog-khariidadeedkan wuxuu soo bandhigayaa khariidado iyo xog la xiriira labada webi oo joogtada ah ee koonfurta Soomaaliya iyo galalka biyorogyadooda. Marka laga soo bilaabo dhankooda sare xagga gudaha Itoobiya webiyada Juba iyo Shabeelle waxay u socdaan koonfur-bari oo waxay galaan dalka Soomaaliya, wayna sii socdaan ilaa ay ku shubaan Badweynta Hindiya. Biyorogyadoodu waxay ku fidsan yihiin dhammaan koonfurta Soomaaliya, inta badan Itoobiya bari, iyo sidoo kale qayb ballaaran oo waqooyi-bari Kenya ah.

SWALIM waxay uruurinaysay xogta galalka labada webi ilaa muddo shan sano ah, hadana waxaa soo raaca sahan masawir dayaarad qaaday oo la tiro dhabey (digital aerial photography survey) oo la fuliyey bilihii Jannaayo- Febraayo 2008 oo hadda laga helo aragti cusub oo qotodheer oo dhulalka ku saabsan.

Buugga Xog-khariidadeedku wuxuu u qaybsan yahay laba qaybood. Qaybta koowaad (qayb kow) waxay soo bandhigaysaa biyorogyada: bogagga 2-15 waxay tusinayaan xogta dhulka, biyomarinnada iyo cimilada ee dhammaan dhulka galalka webiyada Juba-Shabeelle oo ka guba xuduudaha, halka bogagga 16-26 ay ballarinayaan qaybta galalka webiyada ee gudaha Soomaaliya. Cutubka koowaad ee khariidadaha waxaa laga soo minguuriyey keyd xog goboleedyo iyo adduunka, sida FAOclim oo ah xog cimiladeed ka soo jeeda isku xir ballaran oo caalami oo ah saldhigyada aqoonta hawada: NASA SRTM 90 m Digital Elevation Model (DEM); iyo SOTER oo ku saabsan carrada iyo joolojiga. Xogahaan waxay leedahay faaido maadaama aysan isbedelin goballo baaxad weyn. Khariidadaha qaybta galalka ee Soomaaliya waxay salaysan yihiin xog ay toos u soo saaray SWALIM shantii sano oo la soo dhaafay, haday tahay xog ay SWALIM dib u soo heshay ama xog cusub oo ay soo ururisay. Xogta cusub oo la uruuriyey, SWALIM uma haysan maaliyad lagu dabooli karo dalka oo dhan, marka sidaas daraadeed waxay ka shaqaysay dhul yar " Meelo la danaynayey", oo lagu xushay muhimadda dhaqaale ee ay leeyihiin. Dhulka dhuuban oo ku dherersan webiyada ee hoos looga warramayo waa dhulka SWALIM ay ka danaynayso koonfurta Soomaaliya. Dhanka kale, xogtii ka horreysay dagaalka ee ay SWALIM dib u hesho waxay badanaa leedahay ujeedooyin heer qaran ah. Sidaas darteed, tusaale ahaan, khariidadaha buuraha iyo hu,ga dhulka (bogagga 20 iyo 21), waxay ku salaysan tahay xog laga soo uruuriyey hawlqabad SWALIM ku sameeyey dhulka la danaynayo, halka, khariidadaha kale, sida khariidadda Habka Isticmaalka Dhulka oo ku yaal (bogagga 25), ay khuseeyaan xog jirtay oo ay SWALIM sii hagaajisay waxayna daboolaysaa dhul baaxad weyn. Dhammaan khariidadaha waaxdaan qaab raacsan habka joqraafiga oo leh bar habeeq, khariidada walibana waxay leedahay qodob tiro oo lagu tixraaco. Aqristeyaasha danaynaya in ay helaan nuqullada khariidadahakan la tiro dhabey (digital copy) waxay SWALIM kala soo xiriiri karaan: enquires@faoswalim.org.

Qaybta labo iyo saddex awaxay soo bandhigaysaa webiyada Shabeelle iyo Juba mid mid ahaan, oo ku salaysan qaabilan natiijoonka laga helay sahaka masawir dayaaradeedka la tiro dhabey, oo lagu soo saaray masawiro dayaaradeed, midka la arki karo iyo midka shucaaca cas, iyo qaabka dhulka oo la tiro dhabey (Digital Terrain Model (DTM) oo faahfaahsan. Qaybta sare ee labada wabi (midabka cagaaran, Muuqaalka bogga xv) bayaansanaanta masawir dayaaradeedka waxay tahay tan jiiif 50 cm, iyo DTM oo 50 cm joog ah. Qaybta hoos jirta (midab casuur, Muuqaalka bogga xv), labadaba hubantida jiiif iyo joog waa 25 cm. Waxaa masawir dayaaradeedka lagu qaaday dhul wadarta bedka uu qiyaasta yahay 8 840 km² (qiyaas 3 680 km² xagga Wabi Juba iyo 5 160 km² oo ah xagga Shabeelle.

Xogtii laga helay masawiradaan aad iyo aadka u bayaansan waa xog faro badan oo yaab leh, oo badnaantooda awgeed aysan suurogal ahayn in dhammaan halkaan buugga xog-khariidadeedka la isugu keeno, xataa haddii laga dhigo mid toban jeer ka ballaaran. Qaybtaan waxaa la xoog-saaray waxay isugu jirta labo arrimood: 1) in laga xogwarramo muuqaalka guud ee wabiyada, iyo 2) in la soo bandhigo, si tusaale ah, farsamooyinka loo isticmaalo xogta marka ay tahay mid baaxad weyn, iyo siyaabaha loogu adeegsado xirfado kala duwan.

Qayb labo waxay marka hore soo bandhigaysaa dhul dhuuban oo Wabi Shabeelle ku hareeraysan oo sideed waaxood ah, laga soo bilaabo xad Itoobiya ilaa dhammaadka koonfureed, oo ah meel biyofariisi ah. Halkaan wixii hooseeya ilaa meesha ay Wabi Juba isaga yimaadaan (Wabi Shabeelle dhabtii wuxuu ku dara Juba, laakiin waa waqtiyada uu xoog u socdo), ma jiro wax sahanka lagu daboolay, waayo waxaan ka jirin degmooyin ama beero waraab ah. Waaax kasta waxaa loogu magac bixiyey magaalada ugu muhiimsan (badanaa degmada caasimadda ah) oo halkaas ku taal. Dhulka dhuuban ee Juba ku hareeraysan ee ku yaal qayb saddex isaguna waa afar waaxood, oo la daboolay laga soo bilaabo xadka Itoobiya ilaa hoos afka wabiga la yimaado.

Si loogu caawiyo aqristaha inuu ka tilmaan qaato dhammaan waaxyaha dhulka dhuuban ee webiga ku hareeraysan, waax kasta waxay ku bilaabanaysa bog tilmaan guud ah (arag tusaalaha bogga 28) oo soo bandhigaya muuqaalguud dhulka nawaaxiga

and a footprint of the aerial photography images for that section. The features /topics covered are then marked (yellow boxes) on this footprint and labeled with letters (i.e. Enlargement A, B, C, etc). These features / topics and the page on which they are presented are then summarized in an index table. This orientation page also has a short text introducing the section.

On the pages that follow, the features / topics are enlarged: they depict a tract of the river's morphology in the area, details of some crops or irrigation schemes, or barrage, or bridge, etc. In these enlargements are also presented some maps of towns derived from the aerial photos. Then follow one or more plates illustrating the contour lines and the land cover of the area, or a portion of it. The next plates show the morphology of the area by means of digital terrain models (DTM) with some commented topographical cross sections (designated by capital letters), and on the next page are presented more details about specific portions of that area, this time with small letters. This is followed by a map with the road network and settlements for the whole area under consideration, derived from the aerial photos. The last portion of each unit is dedicated to hydro-meteorological information collected in the past or recently by SWALIM and partner agencies in the field. Flood risk maps for the return periods of 5, 20, 50 and 100 years are provided at the conclusion of each unit.

All maps in this section are in UTM 38N projection with WGS84 datum (with coordinates in metres). Some photos collected in the field are also shown in some pages: these are photos taken by SWALIM's staff along the two rivers and depict scenes of everyday life. Readers interested in acquiring more information are welcome to contact SWALIM at enquiries@faoswalim.org.

A note on the Atlas DVD

The printed Atlas could not accommodate all the information available in SWALIM on the two rivers. Thus, to give users access to the complete set of information, a DVD has been enclosed on the back cover of the Atlas.

With this DVD, you will be able to:

- Access a high quality digital copy of the Atlas that allows you to print or extract sections for your own use.
- Access the complete set of information processed from the aerial photography dataset. The information presented includes DTM, Contours, Crop cover, Roads, Settlements and Irrigation. You can zoom to selected areas of interest and extract more information.
- Access an index of the complete set of the aerial photography imagery so that you can easily identify tile numbers of areas of interest when communicating with SWALIM or requesting this data from SWALIM.
- View short demonstrations on how you could use this dataset for various applications.

Although the information presented in the Atlas and DVD is extensive, there is much more that can be done with the aerial photography dataset. A special edition of Somalia Dynamic Atlas based on this dataset will be compiled to allow users exploit the dataset in many other ways.

How to install the DVD

The DVD is fully interactive and will install automatically. Simply insert the DVD into your drive and follow instructions. If the DVD does not start automatically on your computer, open it manually with a file browser such as Windows Explorer and double click the file named index.html and thereafter follow the instructions provided.

waaxdaas ah.

Si xog-warran guud ah, bogga jahayntu wuxuu isugu jiraa muuqaal si caadi ah sawir uga bixinaya khariidadda Soomaaliya meesha waaxdu kaga taal jiidda wabiyada Juba iyoShabeelle iyo raadreebka waaxdaas ay ku leedahay masawirka hawada sare. Muuqaallada/mowduucyada la gudagalay ayaa lagu calaamadiyey (sanduuqyo hurdi ah) raadreebkan oo hadana waxaa lgu suntay xuruuf iwm. Ballaarinta A, B, C IWM. Muuqaaladaan/mowduucyada iyo bogga kaasoo ayaga lgu soo bandhigay ayaa mar dambe lagu soo koobay shax tusmo gudaheed. Boggaan jahaynta waxaa oo ku jira qoraal gaaban oo ka waxbixinaya waaxda.

Bogga soo socda, muuqaallada/mowduucyada waa la ballaariyey: waxay sawir ka bixinayaa qaab-dhismaha webiga aagga dhul ballaaran, waxay faahfaahin ka bixinayaan qaar dalagyo ah ama beero waraab oo waaweyn, ama biyoxireen, ama kaabad (buundo), iwm. Sidoo kale waxaa gudaha ballaarinahaan waxaa lagu soo bandhigay khariidadaha magaalooyin qaarkood oo laga dheegtay (lagala soo baxay) masawirrada hawada sare. Dabadeed waxaa soo raaca tiro muuqaalo (plates) hal ama ka badan ah oo lagu caddaynayo xariijimaha jooga isle'eg leh iyo hu'ga dhulka aagga, ama qayb ka mid ah. Muuqaalka ku xiga wuxuu muujinayaa qaab-dhismaha aagga oo ah qaabqaabka dhulka oo la tiro dhabey (Digital Terrain Model (DTM) oo ay la socoto faallo la xiriirta muuqaal jeex gudubka tobografiyadeed (oo lagu suntay xarafyo weyn), misna bogga xiga waxaa lagu soo gudbiyey faahfaahin dheeraad ah oo ku saabsan qaybo gaar ah oo ka tirsan aagga, oo markaan lagu suntay xuruuf yaryar. Midkaan waxaa daba socda khariidadda oo ay muuqdaan isku xirka waddooyinka iyo degsiimooyinka aagga degaanka la danaynayo oo dhan oo lagala soo dhexbaxay masawirrada hawada sare. Qaybta ugu dambaysa ee waax kasta waxaa loo huray xogta biyo-cimiladeedka la soo uruuriyey waa hore amase SWALIM iyo hayada wada shaqaynta la leh ay dhawaan ka uruuriyeen goobta. Khariidadaha halista fatahaadda soo noqnoqota muddooyin 5, 20, 50, iyo 100 sanadood ayaan ugu dambayn lagu soo gunaanaday waax kasta.

Dhammaan khariidadaha waaxdaan waa qaabka UTM 38N oo leh WGS 84 datum (oo barta halbeegga uu yahay mitir). Waxaa kale oo bogagga qaarkood lagu soo bandhigay masawirro qaar laga soo uruuriyey goobtaas ayada ah: Masawirradaan waxaa dhulka ku dherersan labda webi ka soo qaaday shaqaalaha SWALIM, waxayna muuqaalka sawir ka bixinayaan nolosha maalin kasta. Aqristeyaasha danaynaya in ay helaan xog dheeraad ah waxaa lagu soo dhaweynayaa inay SWALIM kala soo xiriiraan: enquiries@faoswalim.org.

Xusuusta Buugga Naqshadaha ee DVD

Buugga xog-khariidadeedka laguma koobi karo xoggaha SWALIM hayso oo dhan ee la xiira labada wabi. Si loo siiyo qofka isticmaalaya xog dhammaystiran, buugga xog-khariidadeedka xaggiisa dambe waxa lagu soo xiray DVD kaas oo xambaarsan xog badan.

DVD-gan, waxaad ka heli kartaa:

- Awood u helid tayo heer sare ee nuqulka buugga xog-khariidadeedka kaas oo ku saamaxaya in aad dabacaan kartid ama aad kala soo bixi kartid qaybo ka mid ah buuggan si aad u isticmaashid.
- Awood u helid xog dhammaystiran oo laga soo dheegtay macluumaad ka yimid sawirada hawada sare laga qaaday. Xogtaas la soo bandhigey waxa ka mid ah DMT, xariiqmo joog isle'eg leh, hu'ga dalagga, waddooyinka, deeggaamo iyo waraabka. Waad weyneysan kartaa meelo aad xulatay oo aad xiisaynayso hadana xog kale oo badan ayaa la soo bixi kartaa.
- Awood u helid tasmada xarfo ee muuqaalka sawarida hawada sare laga qaaday ah oo dhammaystiran taas oo aad si dhib yar u garan kartid lambarada meelaha aad xiisayneyso marka aad la xiriirayso SWALIM ama aad SWALIM xog ka codsanayso.
- Eeg bandhigyada gaaban si aad macluumaadkan u isticmaali kartid hab hab kala duwan.

In kastoo xogta lagu soo bandhigay buugga xog-khariidadeedka iyo DVD ay baaxad weyn tahay, wax badan baa laga qaban karaa macluumaadka laga helo sawirada hawada sare laga qaaday. Dabacaadan gaar ah ee buugga xog-khariidadeedka Soomaaliya "Somalia Dynamic Atlas" waxa uu ku salaysan yahay Macluumaadkan kuwaas oo lagu ururin doono si ay dadka isticmaala xogtan uga faa'iidaystaan habab kale oo badan.

Sida loogu shubo DVD

Si aad ku shubtid DVD, gali cajalada meesha kambuyuutarka adigoo raacaya tilmaamaha. Haddii DVD-gu uu iskii ugu bilaabmi waayo kambuyuutarkaaga, ku fur habka gacanta adoo isticmaalaya gal daalacasho sida Windows Explorer kuna dhufo laba jeer galka (faylka) leh magaca index.htm dabadeedna raac tilmaamaha lagu siiyey. DVD isaga ayaa iskii isu macnaynaya.