

## Preface

## Araar

Remote sensing is gaining ever larger ground of application in natural resources management. Equipment and methodologies that scientists could only dream of 20 years ago are now a reality. Climatic and hydrologic monitoring data are transmitted through terrestrial networks and satellites at practically any time interval. Other applications provide important information about the content and spatial distribution of various features of the terrain, settlements, vegetation etc. The increase in application is mainly due to vastly improved capabilities for measuring and collecting information, and providing comprehensive, reliable and timely data in a fast and cost-efficient manner.

The sensitivity of the researcher's celestial "eyes" is getting sharper every day, enabling the application of previously unused spectrums of electromagnetic waves to spread to new areas. The extent of floods is monitored by radar through heavy clouds, changes of cultivated fields and forests are revealed by visible and infrared images, and the greenness of vegetation is mapped. In the past, measuring height and slope of the terrain, which is essential in water management, agricultural and road construction activities, needed very tedious, lengthy field surveys. Today it is possible to create reliable high-resolution topographic and thematic datasets by combining remote sensing imagery with in-situ measurements. Moreover, advanced digital aerial photography is proving to be a useful technology for engineering surveys as a cost-effective means of precisely mapping manmade features such as canals and roads. Aerial photography in the visible range combined with infra-red and laser cameras can produce topographic maps revealing terrain details to a 15 centimetres vertical and 30 centimetres horizontal accuracy, or better.

In producing this River Atlas, SWALIM has tapped into the amazing power of these sophisticated technologies. The results presented here speak for themselves. The Juba and Shabelle Rivers, which are lifelines for a very large portion of the Somali population, have been surveyed and are now described by information processed to a level of detail that introduces a new range of practical utility. The survey provides key indicators and information for the planning and allocation of the limited resources to various sectors of economy. The country can use this technology more and more to address various agricultural and environmental issues like water management systems, estimation of soil nutrient and water requirements, food security, crop yield estimates, pest conditions and surveillance, biodiversity assessment, and so on. Remote sensing technology used in conjunction with the rapidly developing information and communication technology can benefit farming communities as a valuable decision support, planning and monitoring tool.

Change is often motivated by unexpected factors. Besides the cost-effectiveness of these technologies demonstrated several times over elsewhere in the world, the security situation in Somalia is what forced SWALIM to move away from the older, field-based data gathering practices and step towards the cutting edge of remote sensing technology. Having applied it to this Atlas, we sincerely hope that the rich contents will assist many users in developing efficient strategies and actions needed for the country's future natural resource management.



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Dareemista fog waxay weli yeelanaysaa isticmaal sii ballaranaya marka la hirgelinayo maaraynta khayraadka dabiiciga ah. Qalab iyo habab cilmiyeed riyo keliya ahaa 20 sano horteed ayaa hawlga ah waqtigaan la joogo. Xogaha kormeer cimiladeed iyo cilmi-biyood ayaa si caadi ah lagu soo gudbiyaa shabakada isgaarsiinta dhuleedka iyo dayaxgacmeedyada waqti kasta. Adeegsiyo kale waxay keenayaan macluumaad muhiim ah oo ku saabsan waxa jira iyo sida muuqaalada kala duwan ay ugu baahsan yihiin dhulka dushiisa, degmooyinka, dhirta iwm. Kororsiimaha adeegisa asaga ah waxaa badanaa ugu wacan awooddiisa oo ah inuu cabiro iyo inuu soo uruuriyo xog, si uu u keeno si degdeg ah xog dhamastiran, lagu kalsoonaan karo hadana waqtiga la socota, hadana kharajku yahay mid wax-ku ool.

Dareenka indhaha cilmibaareyaashu oo malin walba xagga cirka wax ka soo eegayaa waxay suurogelinaysaa in lagu sii xeel dheeraado, hadana ilaa-xad mawjadaha birlab-koronto (spectrum of electromagnetic waves) oo aan horay loo isticmaali jirin ayaa hadda meelo cusub oo badan ku fidaysa. Baaxadda fatahaadaha waxaa lagu kormeeraa raadaar oo ka gudba daruuraha culus, qoyaanka ku jira carrada beeraha waxaa muujiya masawirro ah shucaac-cas (infra-red), markaas ayaa la naqshadeeyaa cagaarnaanta dhirta. Waxaa jirey in cabirrada joogga iyo janjeerka dhulka oo lagama maarmaan u ah maaraynta waraabka, hawlaha beeraha iyo dhismaha waddooyinka, ay waayihii hore u baahnaayeen sahan culus oo waqti dheer oo lagu sameeyo goobta. Waayahakase waxaa suurogal ah in la soo saaro xog-ista socota oo leh faahfaahsanaan sare oo toogariyadeed iyo mawdhuucyo kaleba ayadoo la isku dhafaayo masawir qaadis dareemista fog iyo cabiraad goobta laga qaadayo. Intaas waxaa dheer helista la helay qaadista masawir dayaaradeed tiroole ah (digital aerial photography) oo kharajkiisu wax-ku-ool yahay. Taasi waxay xaqiijineysaa inay tahay farsammo waxtar leh oo awood siinaysa sahamada injiyeeriyadeed oo ayka mid tahay in si sugan loo naqshadeeyo muuqaalada waxyaabaha aadamigu sameeyo sida keliyada iyo waddooyinka. Masawir dayaaradeedka ah inta la arki karo oo ay la socoto shucaaca-cas iyo kaamerada laysarka waxay soo saari karaan khariidado tobogariyadeed oo muujinaya dhulka faahfahintiisa oo gaarta ilaa 10 cm joog iyo 30 cm oo jiiif sugan ah ama ka fiican.

Si loo soo saaro buugga xog-khariidadeedka, SWALIM waxay isticmaashay awoodaha farsamooyinka dhibta badan oo yaabka leh, hadana natiijooyinka la soo bandhigay ayaga ayaa isaga kaa warramaya. Waxaa la sahmey labada webi oo doorweyn ku leh badbaada nolosha ee qayb aad u badan oo ka tirsan dadweynaha Soomaalida, hadana waxaa hadda laga warramayaa xog laga shaqeeey oo heerka faahfaahintu ay abuurayso fursado yaab leh oo isticmaallo kale ah. Sahanku wuxuu siinaya tilmaamo fure ah iyo xogo loo adeegsado qorshaynta iyo jaangooyada qaybaha kala duwan ee khayraadka kooban iyo dhaqaalaha. Dalku wuxuu farsamadaan u adeegsan karaa si badan oo badan oo lagu abaarayo arrimaha kala duwan ee beeraha iyo degaanka, sida hababka maaraynta biyaha, qiyaasidda bacrinta carrada iyo baahida biyaha, sugidda cunto soo saarka, qiyaasidda waxsoosaarka dalagyada, xaaladda cudurrada iyo kormeerista, qiimaynta kala-duwanaanta noolaha, iyo wixii soo raaca. Fursadaha farsamada dareemista fog (remote sensing) oo la xiriirta xogta sida dhaqsiyaha badan u horumaraysa iyo farsamada isgaarsiinta oo faaido u leh bulshada beeraleyda ah waa wax qiimo badan oo waxtar u leh go'aanka, qorshaynta iyo kormeerista.

Isbadelka waxaa badanaa kexeeya waxyaabo aan la filaneyn. Waxaa jira oo kale wax-ku-oolnimada kharajka farsamooyinka sida dhowr jeer lagu muujiyey meelo kale oo adduunka ah, xaaladda nabadgelyo ee Soomaaliya waa waxa sababay in SWALIM ay ka gudubto habkii hore, oo ku dhisna in xogta laga soo uruuriyo goobta degaanka oo looga gudbo dhanka kale ee farsamada dareemista fog. Farsamadaan markii loo adeegsaday buugaan xo-khariidadeedka ah, waxaan runtii rajaynayaa in xogta badan ee ku jirta ay si buuxda uga muuqan doonto go'aamada laga qaadanayo maaraynta khayraadka dabiiciga ah ee dalka.



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