

Floods In Somalia: A time to act

The heavy rains in parts of Somalia in April 2013 came as a blessing following a prolonged dry period in 2010 - 2012 that resulted in the death of approximately 250,000 people. The rains however resulted in increased river levels along the Shabelle River leading to floods that affected people and their livelihoods.

The floods in Southern Somalia that began in mid April caused extreme human suffering and economic damage. In April over 2000 households were displaced by the floods. If the heavy rainfall pattern persists in May, which is highly likely, the number of displacements could rise. Since the devastating 2006 floods in the region several other floods have occurred in the same region in 2009 and 2010. The story of flood disaster and its attendant destruction of lives and property is the same throughout the years and this is likely to remain the same if nothing is done.



Displaced persons vacate their homes in Wanle Weyne following flooding during the Gu Rains of 2013

** Over 50 000 people displaced
*6 500 hectares of cropland inundated
7 children dead

Factors other than the weather may be playing a role in causing the increased flooding. Alterations in the natural environment contribute to the increased frequency of floods in Somalia by increasing erosion rates that result in river bed sedimentation. This makes rivers shallower causing floods to occur even with low amounts of rainfall.

A key contribution that has led to floods year after year is the deliberate cutting of river banks by communities for irrigation purposes during low rainy seasons which they unfortunately forget to close giving way to floods in the event of increased river flows during the rainy season.

Nearly 80% of the floods along the Juba and Shabelle Rivers are due to ongoing human activities along the channels which are not regulated or controlled. The humanitarian organisations respond but unless preventive measures are put in place, Somalia will experience more flooding in the years to come.

SWALIM has been on the front line in a bid to reduce human suffering caused by floods and have developed an early warning system, [Flood Risk and Response Management Information System \(FFRMIS\)](#), that is updated on a daily basis with relevant information. But even with the state of the art early warning system, floods will continue to occur in Somalia if unregulated river diversions continue to take place. The Government and responsible agencies must come up with better and sustainable plans to deal with water management, rather than blame the annual heavy rainfall. A national office to deal with and organise responses to natural disasters should coordinate efforts by all stakeholders involved.

*Peris Muchiri
Hydro - Meteorologist*

A Word from SWALIM's new CTA

The recent developments in Somalia provide an opportunity for FAO-SWALIM to re-establish its activities in Southern Somalia and step-up the capacity development aspect of this project. The long-term vision is to have a Natural Resources Management Information Centre in all regions of Somalia, staffed and managed by Somali nationals who are best placed to know and understand their environment and give crucial information and advice relating to its sustainable management, particularly in water and land resources.

Information collected over the years provides an excellent baseline and opportunity for Somali authorities to further explore and study the water and land resources of Somalia in partnership with the donor community and private organisations whose operations are affected by the quality and availability of these resources. SWALIM is committed to ensuring that the authorities receive as much support as possible through provision of technical support and advice.

*Hussein Gadain
Chief Technical Advisor*

Inside This Edition

Launch of SWALIM Phase V	...2
Monitoring by Remote Sensing	...2
Launch of Hydrogeological Survey	...3
Somalia Digital Document Repository	...4
SWALIM gets a new CTA	...5
SWALIM IV Achievements	...5-7

The launch of SWALIM Phase 5

SWALIM Phase V was launched in February 2013. The project will run for a period of 48 months and will address the necessary development and use of SWALIM information on water and land resources by relevant institutions and other users in Somalia. The project is expected to contribute to sustainable private sector led economic rural development and support food security for populations affected by droughts, floods and resource based conflicts by increasing the use of water and land information in resources management, early warning, preparedness, response and resilience building in Somalia. The project was largely based on the "Concept of a future Somali water and land information system" developed by FAO-SWALIM together with Somali partners and endorsed by all major stakeholders. The capacity of Somali public institutions and other stakeholders involved in management of water, land and other natural resources will be further developed and consolidated to facilitate eventual transfer of the project to the relevant Somali authorities. The information systems, including the monitoring networks will be updated and where appropriate further developed.



Puntland Line Ministers with SWALIM CTA - April 2013

Implementation of the project in Somaliland, Puntland and South/Central Somalia is guided by Regional Coordination Committees comprising relevant government ministries and SWALIM officials. In line with this the first regional coordination committee meetings for Phase V were held on Tuesday 23rd April in Puntland and on Saturday 27th April in Somaliland. The SWALIM CTA shared in detail the project document, highlighting the budget, specific activities, results and outputs. A major priority area for SWALIM Phase V will be capacity building of ministry staff. This is to ensure that when the time comes to hand-over the project, the local staff in Somalia are suitably equipped to continue with the management of the project.

The project will also actively involve other FAO projects, especially FSNAU in activities of common interest such as Somali public institutions capacity development and agro-meteorological monitoring.



RCC meeting in Hargeisa, Somaliland - April 2013

*Evelyn Karanja
Information Officer*

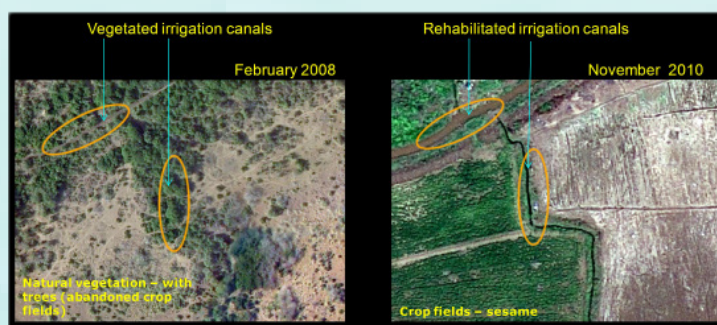
Monitoring By Remote Sensing

Remote Sensing is the acquisition of data about the earth's surface without being in physical contact with it and subsequently interpreting the data and applying the information generated. The data is collected either by airborne (using aircrafts) or space-borne sensors using satellites. In SWALIM-IV two major projects were implemented using Remote Sensing technology.

- Monitoring of FAO aided irrigation rehabilitation activities
- Estimation of cultivable areas in central and southern Somalia

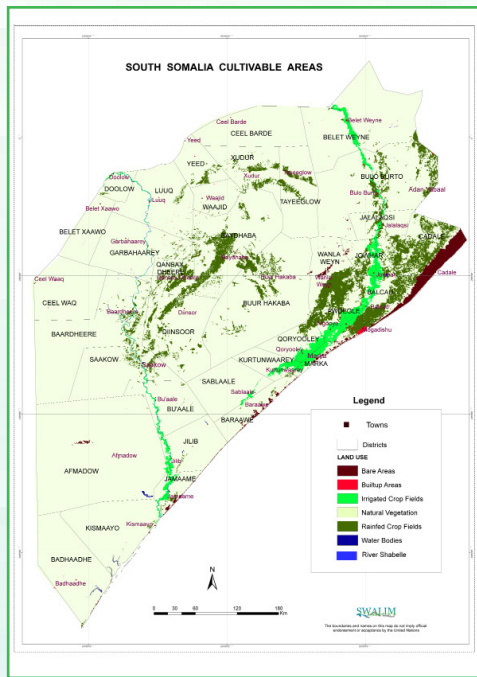
Remote Sensing made it easier to generate information in areas hitherto inaccessible either due to security challenges or terrain problems. In addition, Remote Sensing facilitates highly rapid generation of information that can be used as baseline data necessary for planning purposes.

Aerial photographs (with a resolution of 25cm) and GeoEye Satellite images (with a resolution of 50cm) taken in 2008 and 2011/2012 respectively, were used to assess irrigated areas in Southern Somalia.



Aerial photographs showing impact of irrigation canal rehabilitation in Lower Shabelle region, Somalia

Monitoring By Remote Sensing - continued



Map showing Cultivable Areas in South Somalia

According to this assessment, 78 primary and secondary canals were analysed and the rehabilitation resulted in an increase of 5,768 ha in irrigated agriculture. The Remote Sensing outputs were also useful in the monitoring and evaluation of ground based activities.

In the second project, medium resolution ASTER and Landsat Satellite images with resolutions of 15 and 30 metres respectively, were used to estimate the area that could be cultivated in 36 districts in central and southern Somalia, with an area of 256,000 km². In this project a dot-grid based rapid land cover mapping technique was used. The assessment revealed that only 9.4% of the area is or has been under cultivation in the recent past. Of the 9.4%, 7.1% is rain-fed agriculture while 2.3% is irrigated agriculture. These and other land cover statistics have been compiled for all the 36 districts covered in the study. The outputs of this project include maps, reports: [Irrigation Monitoring Report](#) & [Cultivable Areas Report](#) and statistical data. These results show the importance of Remote Sensing in providing rapid but fairly accurate information about land activities.

Ambrose Oroda
Image Analyst

Launch of Hydrogeological Survey Results in Puntland and Somaliland

The entire region of Somaliland and Puntland extending over 324,000 km² lacks perennial rivers, and groundwater is the sole reliable water resource. Unfortunately, little information is available on the state of groundwater in the region to enable its full exploitation to support a population of over 6 million persons and millions of livestock. Unlike surface water where physical measurements on water quantity and quality are easy, groundwater poses many challenges, particularly in locating potential aquifers with good quality water. Accurate information is needed, which requires expertise and a lot of resources, both of which are lacking in Somaliland and Puntland. As a result, borehole drilling has been going on without adequate information and in an unregulated manner with many becoming dry or yielding too little water to justify the expenses incurred. The risk of over exploitation is also real since no monitoring is done.

In view of the above challenges and the impact of groundwater on urban and rural development as well as on agriculture and livelihoods, FAO through the SWALIM project undertook an extensive groundwater potential assessment study in Somaliland and Puntland between 2011 and 2012. The study comprised satellite remote sensing analysis and field surveys to collect vital groundwater data. The field survey involved visits to over 1,270 water sources carried out by Somali ministry experts, under the guidance of professors from international universities.

The study produced a classification and characterization of groundwater aquifers at a scale of 1:750,000 and detailed assessment of selected aquifers in the two regions at a scale of 1:250,000. Over 340 water samples were analysed for common compounds and heavy metals. The survey results indicated that there are many challenges that have to be addressed to develop groundwater resources in the region. Among other things, the study found out that more than 70% of the water sources in the region exceed World Health Organization (WHO) limits of drinking water for numerous minerals, more so salinity.



Regions of Somaliland & Puntland showing assessments of selected aquifers

Majority of the compounds are not necessarily harmful, but some have health consequences and need to be addressed as the communities still use this water due to lack of alternatives.

The survey recommended further studies and test pumping in the areas identified as having good potential for ground water development to ascertain aquifer production capacity. Through the study, FAO set up a pilot state of the art aquifer monitoring network in 8 major towns in the region, with recommendations for expansion of the network.

The results of the study were launched in two workshops, one in Garowe and the other in Hargeisa in April 2013 during which government officials appreciated the good outputs which they said will greatly improve groundwater development and management. A report on this survey is available [here](#).

Flavian Muthusi
Hydrologist

All SWALIM's data is just a click away!

In the recent past, users of SWALIM information had to either visit the project offices, use data DVDs or access numerous online and offline applications to access the large water and land resources databases created by the project over the last seven years – not an easy thing for many users. The recently launched **SWALIM Data and Document Repository (SDDR)**, now allows access to the entire SWALIM water and land resources database in one place.

Using one simple application, users are able to access records stored in many different datasets. The gigabytes of data in our applications, website and DVDs have been aggregated into this well structured, optimized and easy to use application which can be accessed from any location with an internet connection.

Where internet connectivity is limited, for example within the government ministries in Somalia, SDDR will be available offline. As new data is generated daily, the offline installation will be updated every three months.

The data in SDDR is organized in five content areas: (1) Water data, (2) Land data, (3) Spatial data, (4) Publications and (5) SWALIM applications. Water data includes among others, data daily weather, river levels and water sources data. The land data includes a large soil database with complete soil fertility analysis, land cover, land use, and land degradation, among others. The spatial data includes a large set of high quality ESRI shape files that can be used in geographic information systems.

All SWALIM publications and other rare publications lost during the civil strife that have been recovered from different organizations are available in the publications section. SWALIM applications provides installation files for all information management applications developed by SWALIM.



The SDDR structure

The SDDR is accessible via the URL (<http://faoswalim.org/subsites/sddr>), which takes you to a home page listing the five content areas. For data queries, you start by selecting your geographic area (region, district) of interest, then select the data you are interested in e.g. daily rainfall, and finally the time period (start and end dates) that you want reported. SDDR

will then run the query and present the results on your screen or as export files that you can open in Microsoft Excel or save on your computer. For document / publication search, SDDR has a simple query which provides publication categories and related sub categories. Once you select the main and sub categories, a listed with short descriptions is displayed with a download link. These processes are the same for the offline SDDR.

Access the data you need through the SDDR and please keep us informed about your experience with the system so that we can improve it. If you would like to have an offline installation at your office, let us know by email or visit our field offices for assistance. For more information on SDDR, write to swalim@fao.org

Jeremiah Njeru
Information Management Coordinator

News & Events

- The Hydrogeological Survey, launched in April 2013 is available to all stakeholders engaged in management of water resources in Somaliland and Puntland. In order to get your copy please email swalim@fao.org. The report is also available in an Executive Summary that highlights the objectives, methodology and results of this important undertaking. You may also download both the full report and the executive summary from our website - www.faoswalim.org
- SWIMS, our water sources inventory needs your updates. By sending us updates on the condition of ground water sources in Somalia and their viability, you will help to keep an updated database that will come in handy during development of water-based programmes and interventions. Should you require our forms to update SWIMS contact SO-SWIMS@fao.org
- Would you like to subscribe to our weather bulletins? If so kindly send your request to SO-HYDRO@fao.org
- SWALIM continues to focus on training and capacity building as an important step towards equipping stakeholders with the knowledge and skills to manage our vast water and land resources information. Should you wish to request some training for your organisation, please contact our liaison offices in Somaliland and Puntland or our Nairobi office in Kenya. Trainings are available in GPS and map reading, Information Management, Data Management, Basic GIS, SDDR use, SWIMS, data analysis, soil fertility analysis, among others. A training schedule is available on Page 8 of this newsletter. To request for a training e-mail swalim@fao.org.

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SWALIM gets a new CTA

The fourth phase of SWALIM ended in January 2013 and with it came the end of the leadership of Dr. Zoltan Balint who retired after successfully serving for 8 years as Chief Technical Advisor. Under Zoltan's stewardship SWALIM developed through 3 Phases during which a large set of quality water and land resources information was built together with Somali government line ministries; who are the primary beneficiaries of the project, and in collaboration with other partners including UN agencies and local and international non-governmental organizations (NGOs).

In February 2013, Phase V of SWALIM begun under the helm of Hussein Gadain as Chief Technical Advisor. Hussein has been with SWALIM since 2006 when he joined as the Water Coordinator. During the past 7 years, he has played an important role in steering the water sector of the project. He has overseen numerous remarkable activities such as baseline studies that culminated in more than 19 reports, the water sources survey in 2009, the barrage rehabilitation activities carried out by SWALIM and the recently concluded hydrogeological survey of selected areas in Puntland and Somaliland.

With his vast experience in water resources management, there is no doubt that he will continue to ensure that the highest possible technical standards are achieved in the delivery of project results and the provision of technical assistance and appropriately targeted advice to Somali authorities, international agencies, and associated project partners.



Dr. Zoltan Balint - former CTA, FAO - SWALIM



Hussein Gadain - CTA, FAO - SWALIM

*Evelyn Karanja
Information Officer*

SWALIM IV achievements - Land

The greatest achievement during SWALIM IV in the area of land resources was the realization of the Land Degradation Monitoring Systems. During this phase, SWALIM produced a practical guide for land degradation monitoring in Somalia. Among the contents of the practical guide were the types of land degradation that require monitoring in Somalia, the persons responsible for monitoring, location of monitoring sites with their X and Y coordinates, periodicity of monitoring in the sites, field monitoring planning, methods for land degradation planning, time required for field monitoring, locating the monitoring sites in the field using GPS (Global Positioning System), data collection and equipment and materials needed for the monitoring activity. The methods for monitoring land degradation in Somalia focus on the two major land degradation processes identified during SWALIM III, namely soil erosion and vegetation loss.



Soil Training in Garowe Puntland

The guide to land degradation monitoring for Somalia was presented to the authorities of Puntland and Somaliland. South-Central Somalia was left out due to the unfavorable security situation prevailing at the time of the presentations. Presentation of the guide was accompanied by training of Somali experts on field survey techniques using lecture sessions and practical field assessments. The trainees were then sent to the field to collect data on two thematic areas, Golis mountain forest land cover and mangrove forests in Puntland and Somaliland.

Other activities implemented included assessment and mapping of irrigated agricultural lands in Puntland and training of Somali experts on visual soil analysis. Field data on the irrigated agricultural areas was collected, analyzed and presented in a report. The soil analysis equipment was handed over to the ministries of Agriculture in Puntland and Somaliland.

SWALIM IV achievements - Land (continued)

Ultimately, three reports were produced, Monitoring of Mangroves in Somalia (Puntland, Somaliland and South Central Somalia), Monitoring of the Golis Mountain Forest in Somalia and Inventory of Irrigated Agricultural Areas in Puntland, Somalia. More than 30 NGOs and ministry technical staff members were trained on land degradation techniques in both Puntland and Somaliland.

The Land theme group also actively participated in several professional and product dissemination workshops and retreats, besides offering outstanding support to other SWALIM units and FAO sectors like the Cash For Work (CFW), agriculture and environment sectors. Support to the CFW team involved monitoring irrigation canal rehabilitation, agriculture and water infrastructure rehabilitation and the impact of irrigation canal rehabilitation on crop production between 2008 and 2010. The result of this activity included a summary atlas detailing the interpretation key used in the analysis, with 78 primary canals analysed, 40 grid units developed and a total of 5 768.297 hectares deduced as the impact on crop growing.



Field Survey in Golis Forest

Lastly, the Land theme group was involved in estimating cultivable areas using medium resolution Remote Sensing products. A summary report was compiled detailing the area coverage based on regional and administrative units, of the 6 land cover types analysed (built-up areas, water bodies, bare areas, irrigated crop fields, rainfed crop fields and natural vegetation).

Simon Mumuli
Land Resources Officer

SWALIM IV achievements - Water

Continued collaboration with researchers, policymakers, local communities and other stakeholders in the water sector of Somalia has helped establish strong baseline information in water issues and has created hope for reviving the water sector in the country. SWALIM IV achieved great milestones in developing water related information for planning and decision making in water resources management.

One of the most crucial systems developed by SWALIM is the hydro-meteorological monitoring network with 80 climate stations and 8 river flow data collection sites. The monitoring network has continued to grow in the last 10 years and is implemented with the help of local authorities. Data collected from the monitoring stations is disseminated daily, and is now provided in near real time through a web portal.

An online Early Warning System (EWS) to support preparedness and response against climate related disasters such as floods and droughts has been upgraded. SWALIM developed the [Flood Risk and Response Management Information System \(FRRMIS\)](#) to assist flood management in Somalia. FRRMIS is a web-based information dissemination and sharing platform that brings together essential information on floods under a single user interface. Real-time flood information provided during a flood event includes daily flood observations (water level) compared to moderate and high risk flood levels for major locations. SWALIM also developed a drought monitoring tool which was used effectively during the 2010 -2012 infamous famine in Somalia to show the magnitude and duration of the drought event.

All these systems have been used widely to make informative decisions in planning water resources management. For instance the EWS continues to be used by humanitarian agencies in disaster risk and response management.

To support interventions in the irrigation sector, a well structured system of collecting and managing past and present information on irrigation infrastructure, the Irrigation Information Management System (IIMS) was developed. The IIMS provides information (both spatial and tabular) on ongoing and planned irrigation projects. It gives users of irrigation data a platform to know what is available, the ability to query the system for specific datasets and to download data in different formats.



AWS in Garowe

Eleven gates with lifting mechanisms of the Janaale barrage in Lower Shabelle were replaced. The barrage is used to control water for irrigation purposes and flood management downstream. Food production is expected to greatly improve from irrigated agriculture in close to 30 000 hectares of farms.

The developed systems support other water resources development activities including surface runoff estimation and the hydro-geological survey in northern Somalia. The systems' products are used in development of documents to support research, and for planning purposes e.g. the hydro-meteorological data is used to produce weather bulletins utilised in many sectors for planning purposes and decision making.

Peris Muchiri
Hydro-meteorologist

SWALIM IV achievements - Information Management & Capacity Development

In SWALIM IV, the information management and capacity development unit was tasked with customizing and adapting its products and increasing their use through intensive interaction with users. The project also set out to strengthen water and land information management capacity of Somali public institutions in preparation of initiating handover of SWALIM functions to relevant authorities.

Water and land information systems, including SWIMS, CDI, FRRMIS and IIMS were improved and further developed for ease of use. The products generated by these systems were served through the Client Service Platform which was further developed to allow users to access a variety of information to support their day to day operations in the areas of emergency, rehabilitation and development. A total of 388 interventions by UN agencies, local and international NGOs, government, academic and private organizations were supported by SWALIM water and land information. The information was used in a host of ways including developing proposals, undertaking field assessments and monitoring and evaluation of projects.



Data centre staff at Ministry of Agriculture - Somaliland

In the area of capacity development, over 400 Somalis drawn from different institutions were trained on water and land information management in a total of 56 training sessions. Collaboration continued with 6 ministries through regional coordination committees and letters of understanding drawn between SWALIM and specific ministries. Through this collaboration, 6 data centres were established and continuously supported to build the ministries' capacity to manage water and land information. 12 ministry staff were involved in a Training of Trainers (ToT) program which will be continued in the current phase of the project.

Jeremiah Njeru
Information Management Coordinator



GPS training in Garowe - Puntland

Pictorial



Launch of the Hydrogeological Survey in Hargeisa - Somaliland



Fieldwork during the hydrogeological survey



Water quality testing kit used in the Hydrogeological Survey



Participants at the Hydrogeological Survey launch in Puntland

FAO SWALIM training program takes root in Somalia

Since its inception 7 years ago, FAO SWALIM has adopted an approach that integrates capacity development in all its activities. In line with FAO's capacity development strategy, the project has focused on both the technical and functional skills, using its field offices in Somalia with regular backstopping from the main office in Nairobi. This has been done in close collaboration with partners to address the specific needs of the beneficiaries in Somalia.

For example, the Ministry of Agriculture staff in Somaliland and Puntland are able to operate the weather monitoring network in the two regions, generate and disseminate weather bulletins widely within the two regions and serve clients of the ministries. The current phase will build on this progress with staff devoting most of their time in training and capacity development activities with a weekly presence of Nairobi staff in the field.

As part of capacity development, the project has made great strides in the area of training. In the just concluded SWALIM Phase IV, 56 training sessions involving 552 participants were conducted; of which 228 were in Somaliland, 191 in Puntland and 133 in Nairobi. The training sessions address a wide range of topics from general computing, report writing, water and land resources data collection, information management and mapping among others.



Training in map reading

It has however not been easy - many challenges were faced throughout the capacity building process. Using the lessons learnt, SWALIM has continued to innovate and adapt its approaches. For example, the number of women involved in our training and capacity development efforts has been small and as such, on-going training activities aim at increasing the number of women participants in addition to organizing special training courses targeting women.

Since phase four, the project is focusing on Training of Trainers (ToT), one to one sessions and on-the-job learning. Trainees have improved their skills and their capacity is continuously developing.

However, skills cannot be sustained if not put in constant use. The project will therefore support government ministries to develop their own run field monitoring capacities. So far, the project has provided soil testing, ground water assessment and water quality monitoring equipment to relevant ministries and agencies. The project will continue to take every opportunity to improve the ministry field monitoring capacity.

A number of the ministry staff involved in our training programme are recent graduates from local universities. As such SWALIM has initiated collaboration with six universities in Somaliland and is building a close partnership with the relevant faculties. This will increase the use of SWALIM information, data and tools in relevant courses. The project will also accept students for internship, organize open days and short lectures and share SWALIM e-learning resources. The graduates from these universities are anticipated to play a key role in providing capacity to manage natural resources in Somalia, not only in the development agencies but also within communities and in the government.

*Jeremiah Njeru
Information Management Coordinator*

Training Schedule: May - July 2013

May	MS Excel	SDDR	SWIMS	
Jun	Data Processing & Analysis	Automatic Weather Stations	GIS	Google Earth
Jul	Land Resources Assessment	Remote Sensing	GPS & Map Reading	

Comments?

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