SWALIM Update

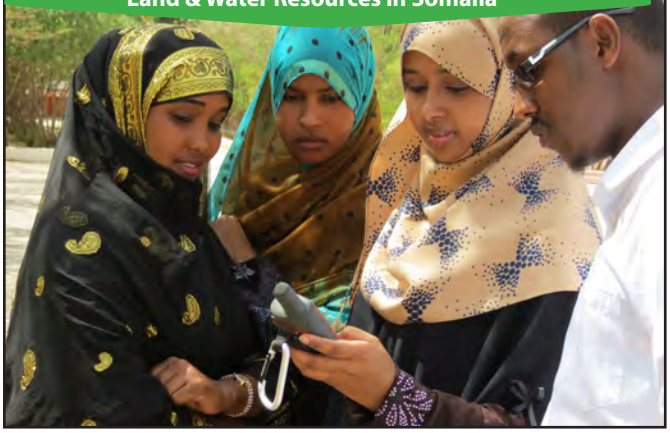
13th Edition
January 2017 - June 2017

SWALIM Runs Webinar on Land and Water Data Collection Using Low Cost Smartphones in Somalia

by Stephen Waswa

The Somalia Water and Land Information Management project (SWALIM) is one of the few UN development programmes to have information management as its primary mission, and using technologies such as Geographic Information Systems (GIS), Remote Sensing (RS) and data collection with mobile devices and modern web applications. Under the oversight of the Food and Agriculture Organization of the United Nations (FAO), SWALIM has been able to successfully introduce various technological innovations to benefit communities dependent on fragile land and water resources, despite the very challenging environment in Somalia.

Training on Innovative Approaches to Collecting Data on Land & Water Resources in Somalia



Since its launch in 2001, SWALIM has sought to use ICTs to achieve its objectives, introducing innovative approaches and methods adapted to the particular environment in which it operates. As the programme has developed, managers have taken a particular interest to ensure that the initiative makes full use of cutting-edge technologies as they emerge. As a result, SWALIM has become the primary source of reliable information on land and water resources in Somalia, serving as a basis for increased food security through sustainable agriculture.

Through a series of webinars offered by the e-agriculture platform (http://e-agriculture.org), SWALIM seeks to demostrate how it is using technology to improve food security in Somalia, sharing lessons learned with the members of the e-Agriculture Community and other interested participants.

The first of a series of webinars was delivered on the 5th of June 2017 focusing on the use of "low cost smartphones to collect land and water data in Somalia".

Collecting data in remote locations in Somalia is complicated by many factors including security constrains for non locals, restriction on the use of data collection equipment such as GPS and cameras and communication barriers among others. To address these challenges, SWALIM has developed a set of land and water data collection tools based on open source software available for low-cost smartphones. SWALIM uses this technology to undertake high quality field data collection in security constrained areas and provides results in a short period. These can be run with or without a network connection, and used to store the collected data for later transmission or uploading. The data collected is transferred to a central computer, which converts it into standard formats for data compilation, aggregation and analysis. The data collected is automatically linked to SWALIM online information platforms and made available to technical experts in near real time.

You can access a 30 minute recording of the webinar through this link: http://bit.ly/2r9Fyz2.

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Prosopis Invaded Areas in Somaliland

by Musse Shaie

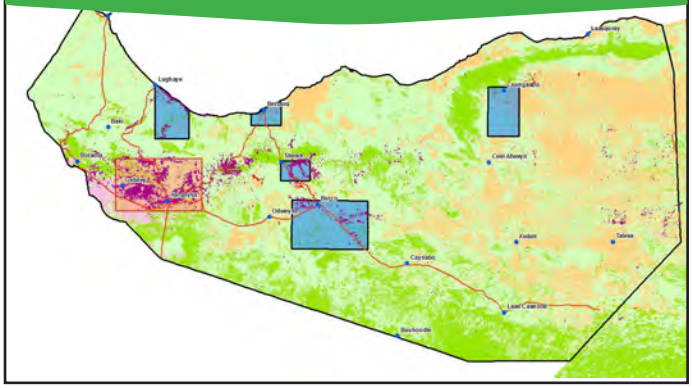
According to a study carried out by Candlelight in 2006, Prosopis was first introduced in Somalia in the early 1950 in the area west of Berbera by a British forester to combat desertification, dust storms and sand dune movement. Later, in the 1970s and 1980s, it was introduced in several areas of Somaliland to reduce environment degradation in the area. The inhabitants were destroying native trees for fuelwood and construction material. It was felt that Prosopis could growing fast compared to the slow growing native trees and therefore was a good substitute. Initially, Prosopis was confined in small areas around the refugee camps, but later spread to many parts of the country especially in the central part of Waqooyi Galbeed and Awdal Regions, mostly along waterways originating from Golis Mountain but also in creeks, agricultural farms, wetlands, coastal area along the Gulf of Aden from Lughaya to Berbera, as well as in Burco district. It is interesting to note that are no Prosopis plants in the higher altitude parts in Sheikh and Ceerigaabo.

FAO SWALIM has been mapping and studying the spread of Prosopis in Somalia. More recently, a survey was carried in Januray 2017 together with the Somaliland Ministry of Environment and Rural Development to map out the extent of the spread of Proposis in Somaliland. Five areas of interest were selected covering the main landform units of Somaliland that include flat lying areas, plateaus, hills, mountain ranges and coastal areas. The climate of these landscapes vary from desert (annual rainfall of 100mm and temperature of 28-35 oC) in the coastal areas to semi humid (annual rainfall of 500 - 600 mm annual rainfall and temperature of 20-22 °C) in the mountain ranges.

The five blue boxes shown below indicate the AOI reached during the field data collection. The red box shows the area already mapped by SWALIM during a previous Prosopis data collection study.

The survey observed that despite the extremely dry condition;

Prosopis Juliflora Study Areas of Interest in Somaliland



Prosopis plants were exceptionally green and resistant to drought and were often flowering and with pods in most of the areas. Prosopis was found growing as trees or shrubs and also forms pure stand of forest thickets in the invaded rangelands and cropland. It was also scattered as shrubs in stony or gravelly surfaces inter growing with cactus. In the wetter alluvial deposits flanking the watercourses in the northern escarpment of the Golis Mountain, it was found to form very dense impenetrable thickets.

It was observed that Prosopis had a strong ability to thrive in all environments, despite the condition of soils and moisture. The survey learnt that Prosopis spreads rapidly in all directions, particularly in wetlands and along the watercourses and in the boundaries of the farms. The ecology of this region has changed with the spread of

Prosopis Juliflora in Burao District, Somaliland

Prosopis, locally known as "Garanwaa".

Interviews with local pastoralists and agro-pastoralists confirmed some benefits from Prosopis, particularly in drought periods. These include:

a) Fuelwood and charcoal production for family use and for sale

b) Livestock feed (pods)

c) Shade

d) Building posts, poles and sticks

e) Fence for farm and animal enclosures

f) Windbreak to reduce dust storm

g) Reduce desertification and sand dunes stabilization

On the other hand, many negative impacts were voiced, including:

a) Invasion of communal pasture lands and crop fields and reduction of cropping areas and grazing ground as land with palatable indigenous grasses, tree and shrub fodder is taken over by Prosopis.

b) Livestock disease for livestock exclusively feeding on Prosopis pods for extended periods. The disease include reduced appetite and weight loss, weakness, teeth decaying, diar-

rhea, fever, paralysis and death.

c) Reduced animal productivity in terms of milk and meat.

d) Injuries to people and livestock caused by sharp and poisonous Prosopis thorns.

e) Reduction in land accessibility by human and animal in invaded areas by blocking of roads and water points.

f) Water scarcity due to lowering of the water table in shallow wells, as well as deterioration of the quality of water.

g) Livestock attack by predators such as hyenas and jackal hiding in Prosopis invaded areas.

It is clear that the rapid spread of Prosopis in the rangelands and cropped areas of Somaliland is harming the livelihood of the communities in a significant way. The local people however do not have the knowledge required to control the spread of Prosopis. There is a need to acquire skills and technologies needed to control the tree including making use of it. Communities have been mobilized several times by different NGOs to clear Prosopis thickets by uprooting seedlings, cutting and burning trees and burning the wood for charcoal production. However, the people are desperate as Prosopis regenerates easily and rapidly. The study therefore suggests that a more strategic approach for controlling Prosopis is required.

SWALIM Supports the Drought Operation & Coordination Centre (DOCC) in Mogadishu

by Maingi Julie

The humanitarian situation in Somalia has been deteriorating since drought was declared in late 2016. It is estimated that 6.2 million people are in need of humanitarian aid during this period. Most affected being women, children and the old in the community. Poor rains received during the last 2 years have made the already harsh conditions worse with acute shortage of clean drinking water, failed crops, deaths of thousands of livestock and sharp increase in food prices making the situation worse and unbearable. As the situation worsens, a huge number of the population is migrating from the rural areas and moving into the urban areas creating IDP camps adding pressure to the already stressed food and water supplies.

Humanitarian Agencies have used the Cluster Approach to respond to emergencies. Clusters are groups of humanitarian organizations, both UN and non-UN, in each of the main sectors of humanitarian action e.g. water, nutrition and health. These Agencies work with different Clusters to improve operations, avoid gaps, and prevent overlap and duplication of activities.. Allocation on to a Cluster is based on the core activity of the organization, for example FAO and WFP are in the Food Security Cluster while UNICEF is in the Education and Nutrition Cluster. The activities carried out by the Clusters are coordinated by the Humanitarian and Emergency relief coordinator.

In response to this crisis in Somalia the Humanitarian and Emergency relief coordinator, supported by the humanitarian country team, has established 3 Drought Operation and Coordination Centre commonly known as DOCC in Mogadishu, Baidoa and Garowe. The DOCC's are providing a platform where all the clusters come together to plan and execute humanitarian operations. DOCC's are helping in coordination of operations, logistics and security arrangements among the humanitarian workers. DOCC's allow for sharing of critical data and information with the State Administrations and among the different clusters within the UN.

SWALIM is offering technical support to the DOCC in Mogadishu. This support is directly offered by both the Remote sensing/GIS unit and the Water Unit. The Remote Sensing/GIS unit is offering its technical support in map making and analyzing of data that are received from the field, turning this into infographics or customized maps according to the communication needs. Maps are a useful tool in helping emergency responders, aid groups and communities to better respond to an emergency. Maps help in understanding the relationships, trends and patterns on the current situation. Example of Maps done for DOCC are: a map done to track cholera cases and forecast where the next case can occur thus enable the health cluster come up with a mitigation measure for the next town. Road map that helps the logistics cluster plan the best and fastest way to get help to the ones in need. Maps done showing the IDP's camps enable the logistics team plan on how the much needed aid can reach all those in need.

DOCC Room in Mogadishu, Somalia

The Water team has an elaborate and effective hydro met monitoring network across the country that is providing daily critical information on rainfall and drought dynamics thus assisting the DOCC's in planning for different drought relief and famine prevention activities. The monitoring includes river levels, rainfall and the status of strategic boreholes. This information is used by the DOCC's to advice decision makers on water availability for both domestic and livestock use and irrigated crop production. The water team also provides weather forecast which allows for planning by the clusters on water trucking, rehabilitation and preparation of canals, repair and fixing river breakages among other uses.

Impacts of river breakages monitoring on communities along Shabelle River

by Flavian Muthusi

The Juba and Shabelle rivers of Somalia have fertile soils and abundant amount of water that allows irrigated agriculture to be carried out throughout the year, making the riverine areas of the two rivers traditionally the bread basket of Somalia. However, the two rivers are prone to flooding mainly because the bulk of their flow originate from the Ethiopian highlands, which receives very high rainfall during the rainy seasons.

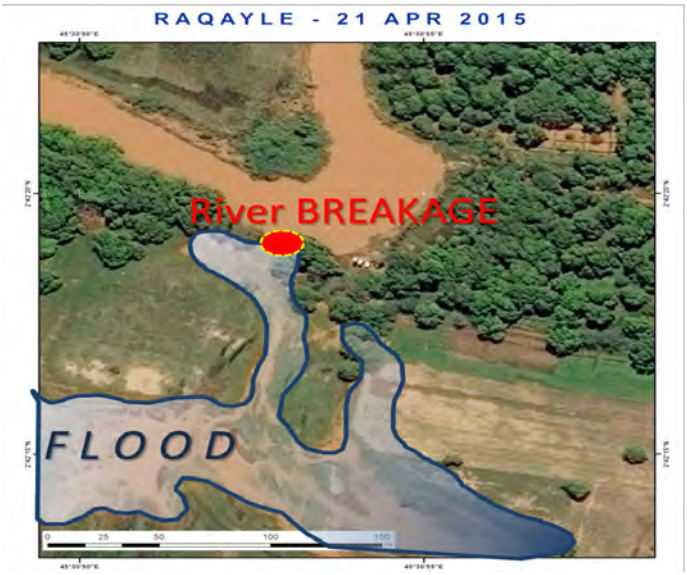
Before the collapse of the Somali government, the irrigation system was well developed and managed effectively controlling flooding. The irrigation infrastructure was coordinated and maintained by River Management Authorities established under the Ministry of Agriculture. The authorities regulate river flow to ensure fair access to water by upstream and downstream users.

They also maintained the river including dredging of the river bed and strengthening of the river banks.

Today, this system is no longer working and flooding occurs almost every season, especially in the middle and lower reaches of Shebelle river. This is mainly because of unregulated irrigation system, sediment deposition on the river channel and weak river banks. Additionally, farmers break the river banks to get water to their farms during the dry season. Frequent flooding has been causing havoc to communities along the two rivers with heavy loses of human lives, livestock, crops and damage of roads and other infrastructure.

To minimize impacts of flooding, FAO SWALIM has developed a system for monitoring river breakages along the two rivers using Remote Sensing and Geo-Spatial tool. The system started in 2014

Before



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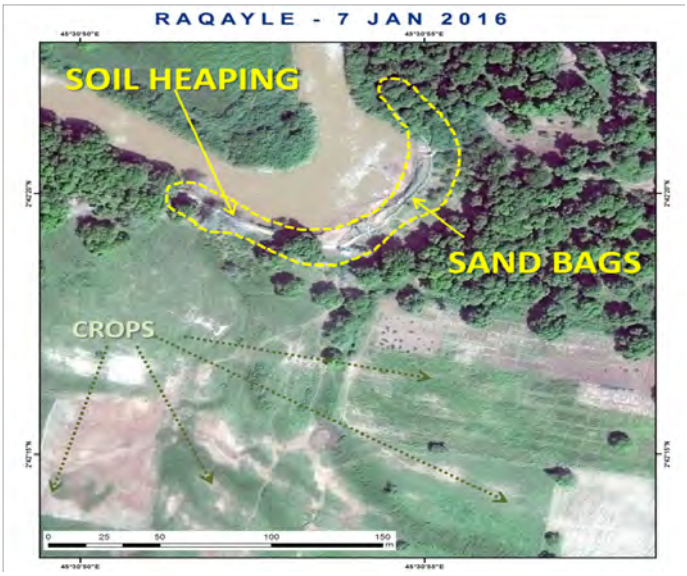


and provides data and information on river breakages including potential, open and closed breakages.

This database (http://systems.faoso.net/frrims/rivers/breakages) is availed to the Federal Government and all humanitarian and development agencies before the onset of the rains to help them plan, design and implement activities to close open river breakages. Timely closure of open river breakages reduces flood damage to cropland, livestock and other property and also minimize displacement of people due to flooding.

This was demonstrated in short rains in 2015. Just before the onset of the season, which was actually an El Nino season, SWALIM updated the river breakages database and disseminated information to different partners. This triggered quick intervention by FAO and other partners to close the open breakages and reinforce the weak river banks. As a result there was minimal flooding in many areas of the Shabelle, unlike in previous years. In Jowhar district, a comparison between 2015 and 2016 identified that only 12,200 hectares of land was flooded, compared to 21,300 hectares flooded in early 2015, a 43% reduction in flooding, despite the fact that 2015 was an ElNino season with much higher river flows. The reduction in the flooded area was attributed to the early action taken by the government and intervening agencies based on the SWALIM river breakages database.

Monitoring of the river breakages however has some challenges mainly because of heavy cloud cover in the rain season which hinders identification of the river breakages. To solve the challenge of cloud cover SWALIM is looking into possibilities of partnering with organizations that provide radar images which can penetrate clouds. More field verifications are also needed to get additional details on the breakages for more informed interventions. For this, SWALIM plans to work more closely with the Federal Government Ministries and Disaster Agencies, as well as other non-governmental partners.

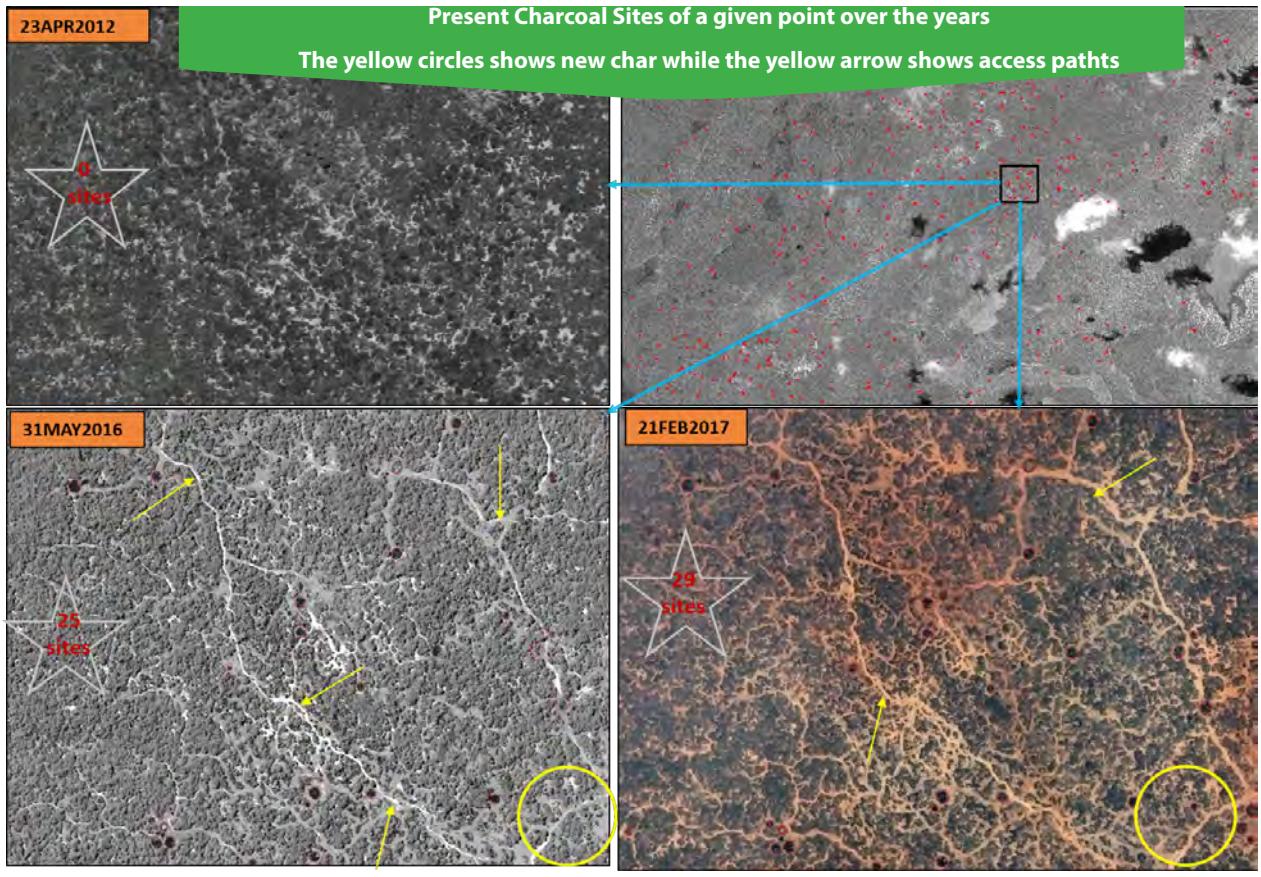
Charcoal Production in South Central Somalia

by Esther Makabe

Charcoal is a main source of cooking fuel in Somalia and is also a major source of revenue for the community. Charcoal production triggers deforestation and has led to environmental degradation. For instance, the loss of the protective tree layer has the direct consequence of increasing the underlying soil's vulnerability to erosion by exposing it to agents such as winds and heavy rains (FAO, 2007). Charcoal production accelerates the process of desertification, decreasing the amount of land useable for agriculture or grazing and pushing locals out of areas as they become uninhabitable after charcoal producers clear all the trees. This deforestation also decreases bio-diversity as species that relied on the tree groves are unable to survive without them. Degraded rangelands due to tree felling to meet the increasing charcoal demand are a common sight across Somalia.

Larger and consequently denser trees are selected for charcoal production. Therefore, the main and preferred timber species is *Acacia bussei*. A recent study by FAOSWALIM for Puntland estimated a 5% loss of this tree species annually. This estimate can be applied across Somalia. Another study by SWALIM focusing on Jilib area estimated a 3.3% tree cover loss within a very short period (2011-2013). This loss was solely attributed to charcoal production in the region. Large scale charcoal production concentrates first in areas where tree density is higher and distance from main roads, agriculture areas, and settlements is low, but also, as tree cover diminishes, new access roads are built to exploit areas further away. Tracks/access paths are a common feature at/around charcoal producing regions.

In some cases, the trees are felled at a different site and transported to another one where the kiln is made for charcoal production.



In Somalia charcoal is produced in 'kilns'; a type of oven.

The cut trees are piled up, covered with iron sheets, and buried with sand. After the oven burns for up to a week, the sand and sheets are removed. The wood has then turned into charcoal, which is then packed into bags/sacks ready to transport for export or domestic use (often using tracks and 'dhows'; lateen-rigged ships with one or two masts, used in the Indian Ocean). Large quantities are transported each year to the Arabian Peninsula, despite a UN ban on charcoal export.

The study area covering the districts of Jamaame, major parts of Badhaadhe, Kismaayo, Jilib, Bu'aale, Afmadow, and minor parts of Sablaale, Diinsoor and Saakow and measuring about 36,700 sqkm was defined using both Landsat images classified as Forested areas and the observations made on VHR considering the area affected by deforestation for charcoal production.

Multi-temporal dataset of very high-resolution remote sensing images such as WorldView-1, 2 and 3 were used to map kiln locations in the study area. The acquisition dates of the images range from 2011 to 2017. Charcoal production sites can be seen on satellite images as dark round/ almost round patches. Many small tracks/ paths are a common feature at these sites. They are used for access and transport. The average radius of the kilns is 3.3m but some are as big as 6m in radius.

Multi temporal analysis of vhr images reveals a tremendous increase of charcoal sites over the years.

Somalia Remains in Drought Conditions Following another field Rainy Season

by Peris Muchiri & Gure Abdulkadir

Somalia is in the second year of a severe drought—the kind that is increasingly likely as the climate warms.

All the water dependent sectors have been adversely affected, reflecting different levels of drought preparedness in Somalia. For now, urban areas are in a better shape, thanks to diversified humanitarian aid in the country. The greatest vulnerabilities are in some low-income rural communities where water resources are running dry. Two years of drought has increased challenges in all areas and require continued—and likely increasingly difficult—adaptations. Emergency programs will need to be significantly expanded to get drinking water to rural residents and livestock. Somalia therefore needs to start a longer-term effort to build drought resilience in the most vulnerable areas.

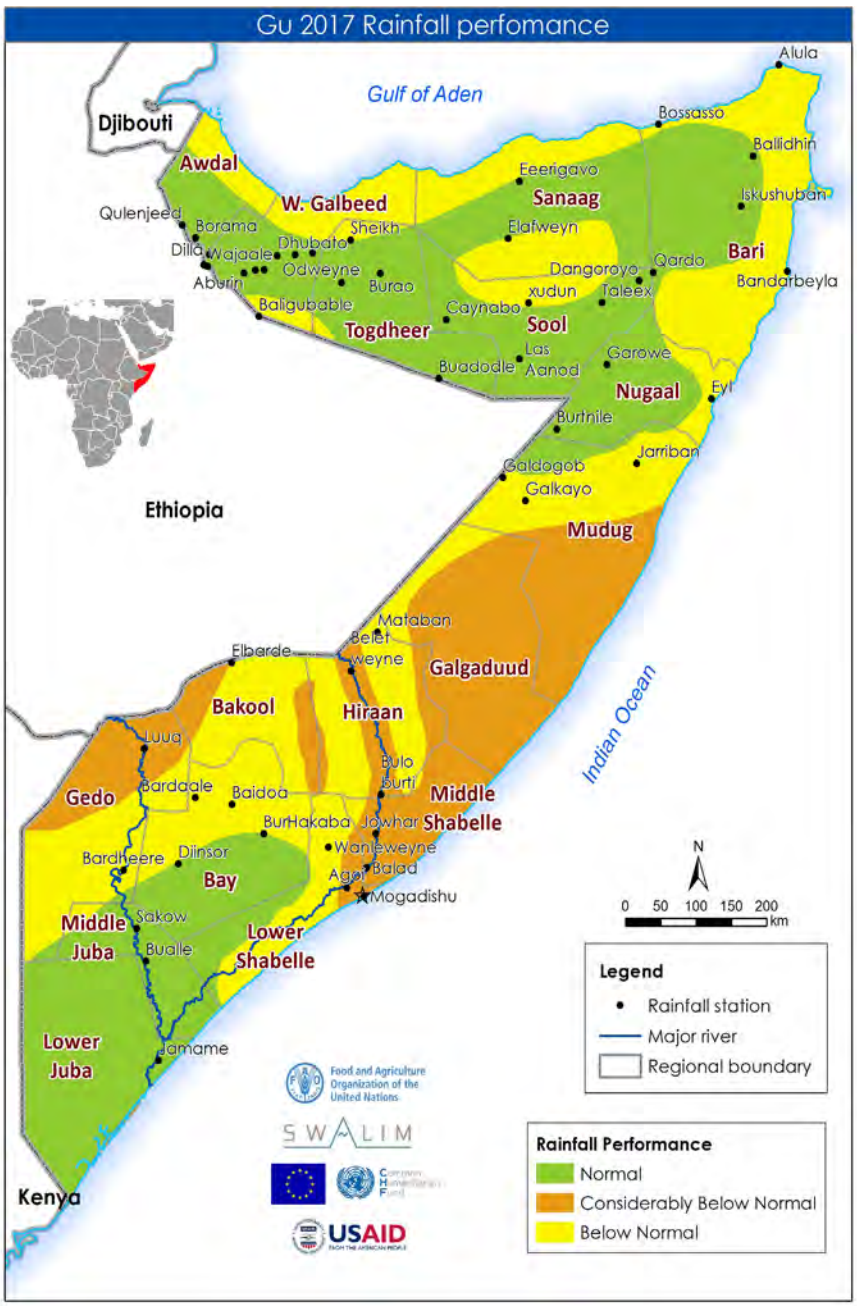
Somali communities were looking forward to a relief from the Gu 2017 rainfall season but the devastating drought conditions meant that the country experienced yet another below-average season affecting the recovery of the key livelihood sectors; agricultural and livestock. So far, drought conditions continues to affect Somalia; a situation that may persist until the next rainy season in October.

The Gu rainy season was generally poor in most parts of the country except some places in Puntland and Somaliland that saw good rains during the month of May. The southern regions of Middle Juba, Lower Juba and southern Bay also recorded good rains during the months of May and June. Regions that recorded very poor rains include Mududg, Galgaduud, Hiraan, Middle Shabelle, Lower Shabelle, Bakool, Gedo and southern parts of Bay.

The Gu rains were sporadic and scattered. In March, a few pockets of Somaliland recorded good rains followed by a long dry period until end of April when the rains started in most parts albeit very late. The rains then spread in space, time and quantity in May. While many parts continued to receive rains until the last week of May, there was an early cessation of the rains in parts of south and central regions except South of Bay and Middle and Lower Juba regions that continued to receive rains in June.

Even with the rains, most parts of the country remain under drought conditions with the impacts being felt across the country. More rains are required to end the ongoing drought in the country and the drought situation is expected to continue until the coming Deyr season in October.

It is important to note that only 20% to 40% of the ground water sources have been sufficiently recharged throughout the country with the rest remaining water stressed.



The rains, though poorly distributed, eased stress levels for the livestock sector due to regrowth of pasture, which provided grazing lands. Areas with below normal rains also saw regrowth of pasture, but may not last until the next season expected in October.

If El Niño predictions for late 2017 prove correct, Deyr rainfall in Somalia could be substantial. Most climate models gives the El Niño event a 45 percent chance of returning in 2017. El Niño events tends to cause enhanced rainfall events in Somalia, generally cool temperatures and lots of run-off, which would be good for both ground and surface water recharge in the country.

Use of Live Map to Access Water Sources Information for Drought Response

by Flavian Muthusi

Somalia has been experiencing one of the most severe drought conditions in the recent past, following consecutive seasons of failed rainfall across the country. Many parts of the country are experiencing acute water shortage and dramatic deterioration of food security. As a result, the humanitarian agencies have scaled up interventions since the beginning of the year to respond to the drought and prevent famine.

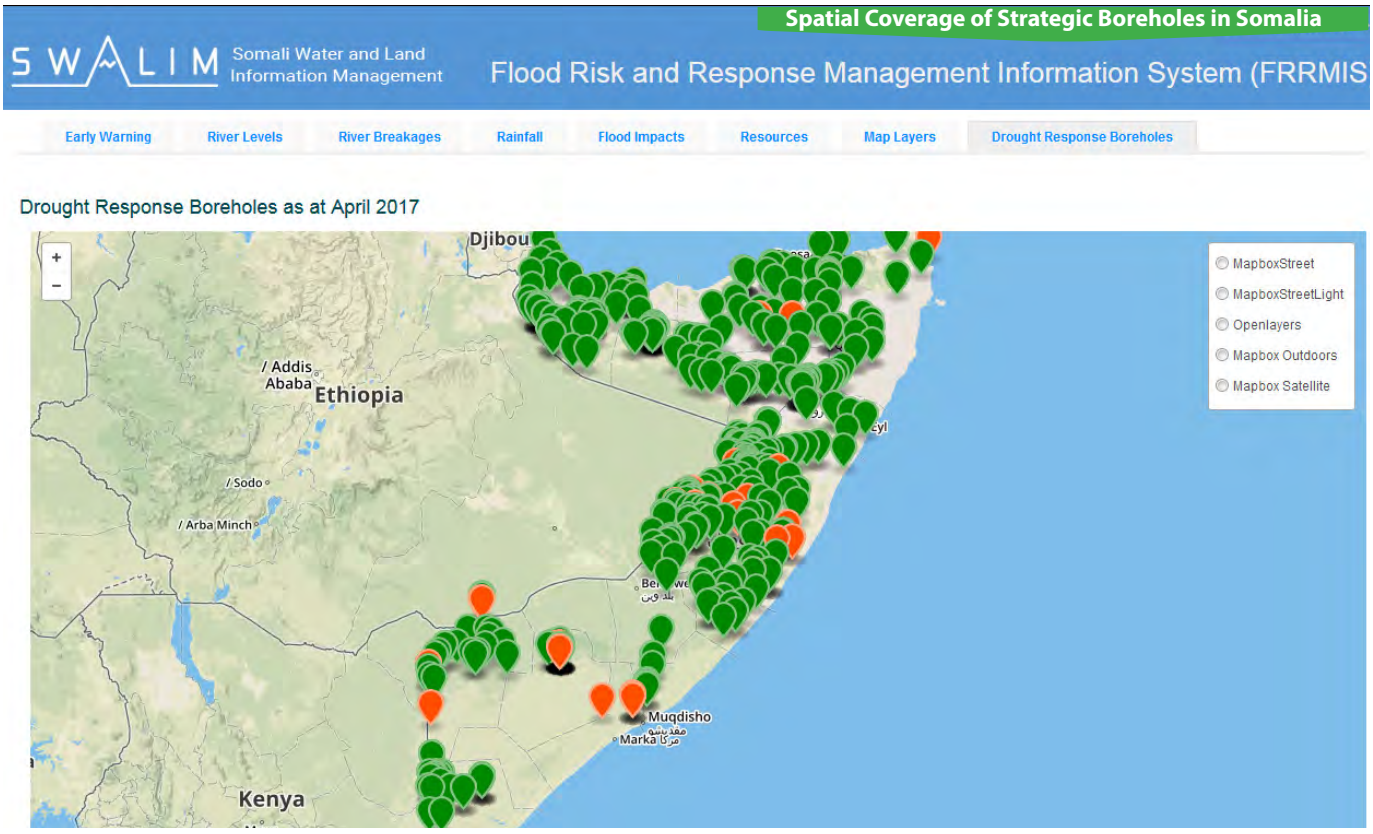
FAO SWALIM continues to provide information on weather, river levels and groundwater, which informs planning and prioritization of water related interventions. Key among the ongoing drought interventions by different clusters is water trucking for domestic use and livestock watering. Majority of the water sources in the country dried up due to the prolonged drought, including the only perennial rivers in the country – Juba and Shabelle. Groundwater from key strategic water sources, mainly boreholes, became the only source of water for both rural and urban use across the country. There was need therefore, to keep monitoring the status of these strategic boreholes, and provide information to the humanitarian agencies to plan and carry out water trucking and other interventions.

Keeping up to date information and providing an updated information on the strategic boreholes requires a consolidated effort of different stakeholders. This would ensure country wide coverage, as government water authorities and other partners complement each other with information based on their area of operation.

The Somalia WASH Cluster has been very instrumental in coordinating the field updates from the different partners, while SWALIM is tasked with consolidating and mapping the field reports. In Somaliland and Puntland the Government Water Authorities namely Ministry of Water Resources and Puntland Water Authority for Water, Energy and Natural Resources respectively have been actively involved in providing regular updates within their regions.

SWALIM makes use of the existing tools to disseminate the strategic boreholes status information. This includes the online Water Sources Live Map, accessible through the link; http://systems.faoso.net/frrims/water_sources/index . The live map provides partners with an interactive interface where they can get an overview of the spatial distribution of the boreholes in each region, as well as detailed information about specific boreholes including the exact location, depth, functional status, water quality (salinity), yield, water price, etc. Agencies carrying out water related interventions, mainly trucking, are making use of this information to identify the available boreholes for water trucking and the distances involved, as this has implications on the cost.

Some parts of the country have however not been covered during the latest status updates. SWALIM is working with agencies with presence in those areas to provide this critical information, for the benefit of the Somali community in dire need of water access during this time of drought. SWALIM will continue to regularly update the data for the areas already mapped.

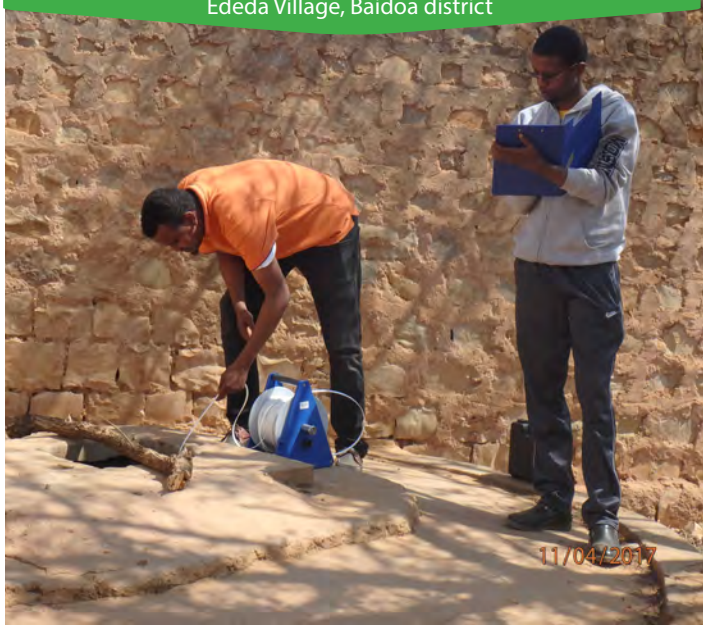


Pictorial

A woman fetching water for domestic use

Water Catchment in Xudur Village, Bakool Region

Field Surveyour Enumerators measuring water level in a shallow well in Ededa Village, Baidoa district



Water Quality Testing at Dayuuro Village, Xudur District

SWALIM Digital Document Repository (SDDR) Updates

SDDR has been updated with the following time-series data for the period upto April 2017:

- Climate data from automatic weather stations
- Rainfall data from manual stations
- River levels and discharge data
- Synoptic stations data

Did You Know?

Somalia's annual average rainfall is 282 millimetres with 75% of the rain falling during Gu rainy season and 25% during the Deyr rainy season?

Somalia has 6 river basins namely: Juba, Shabelle, Ogaden, Darror, Gulf of Aden and Nugaal

SWALIM has a total of 7 weather alerts and bulletins issued before, during and after each rainy seasons?

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