



Summary Outcomes: AfrigeOSS-EOPower-GEOGLAM Southern Africa sub-regional Workshop, Pretoria, 8-9 May 2014

Introduction

The workshop was a joint effort between AfrigeOSS, EOPOWER FP7 Project and GEO global initiative, GEOGLAM, aimed for the Southern Africa Development Community (SADC). The South African National Space Agency (SANSA), supported by CSIR National Earth Observation and Space Secretariat (NEOSS - SAGEO) and the GEO Secretariat hosted the workshop.

The workshop had 24 participants representing 6 SADC countries, i.e., Botswana (Ministry of Agriculture), Malawi (Department of Surveys; Ministry of Agriculture and Food Security), Swaziland (Ministry of Agriculture), South Africa (Department of Agriculture, Forestry and Fisheries; Department of Science and Technology (DST); Geoterra Image; CSIR), Zambia (Ministry of Agriculture and Livestock) and Zimbabwe (University of Zimbabwe) and sub-regional programme i.e. SADC MESA.

Participants received a welcoming from Imraan Saloojee of SANSA and opening remarks were delivered by Tumisang Sebitloane of the DST. Introductory presentations were provided on GEO & GEOSS, AfrigeOSS, EOPower, GEOGLAM and a presentation by the DST Africa Cooperation on bilateral and multi-lateral agreements and how to leverage them.

Use of Earth observations at national level:

Session 2 was dedicated to national presentations on use of Earth observations. The use of Earth observations is not at same level in the various countries, and within the country it varies between institutions and government departments.

Opportunities:

- all countries are striving towards the use of geospatial and earth observations for informed decision making
- countries benefited from the AMESD SADC Thema project, with some such as the University of Zimbabwe used the project as a spring board to advance their work
- most SADC countries are members of RCMRD
- SANSA has data catalogue covering SADC that member states can access through the EODC catalogue. The agency is open to hear from member states how the catalogue can be expanded
- Infrastructure, though needs to be updated, was put in place by the AMESD SADC Thema project for fire and agriculture services
- SANSA is registered as a Service Provider and Project Manager with the Disaster Charter





Challenges:

- access to fit for use remote sensing data is lacking, restricted bandwidth adds to the lack of access
- shortage of properly trained
- access to image processing software
- lack of communication and linkages between government departments, national & regional remote sensing centres, universities and private sector is impeding countries progress towards using earth observations
- data sharing principles and policies not in place, implemented or enforced

SANSA will provide assistance to the infrastructure (data and software) challenges. Further SANSA made a call to member states to provide training requirements geared towards addressing human resource capacity.

National Agriculture Monitoring Systems and Components of a sub-regional Monitoring System

As with the use of Earth observations, the status of agriculture monitoring systems in the sub-region is not the same.

- South Africa has a sophisticated system that integrates different technologies and spatial data, such as satellite, airborne and field surveys. This is also an effort between government and private sector. The return on the investment of the system is unquestionable.
- Malawi has a system that caters for small scale farmers and undertakes maize crop estimation for now. The return on investment not yet undertaken.
- Zimbabwe is currently using field measurements together with meteorology data for the assessment; the research results undertaken by University of Zimbabwe for a post harvest maize model will be integrated into the system. Predictive modeling is under research. The maize post harvest model can be used by countries with similar conditions as Zimbabwe.
- Zambia has a semi-operational system operated by the Central Statistical Office and Ministry of Agriculture and Livestock.
- Swaziland undertakes rangeland management though data is mainly useful for government farmers not for smallholder farmers. A livestock monitoring system is available whilst crop and livestock assessment is based on field data.
- Botswana has 5 agriculture monitoring systems that are not centralized. The systems mainly use field surveys and receive information from the AMESD project.

The components of a sub-regional agriculture monitoring system were captured as presented in **Table 1** below.



Table 1 Components of a SADC Regional Agriculture Monitoring System

Component	Small Scale <5ha	Medium scale 5-20ha	Large Scale >20m
A field area estimation system	high resolution satellite (10-30m) / aerial imagery	high resolution satellite / aerial imagery	high resolution satellite (20-30m)
A crop area estimation system	Combination of Crop type and field area estimate		
A crop type identification system	In-situ visit. Conservation cropping/intercropping. Sampling basis (stratify from field area/zoning) - Crowd sourcing	In-situ to support. Temporal imagery to capture phenology comb with crop calendar. Medium to high res in combination with sampling from field area	Phenology and crop calendar, supported by aerial observation (e.g. similar to PICES).
A yield estimation system	In-situ visit vs EO data field derived models (coarse res). Comb with crop mask		Dry Dekad models are for maize and harvested. Temporal models for forecasting
A crop condition monitoring system	Take advantage of the AMESD products to make use through the season	Take advantage of the AMESD products to make use through the season	Take advantage of the AMESD products to make use through the season
A planting progress system	Look at product of AMESD and looked at through use. Also consider in research in terms of climate change variations		
A harvesting progress system			
A seasonal outlook system	Climate outlooks from AMESD		
An information distribution or access system	AMESD-GEONETCAST; The discussed App. Keep in mind that farmers and access to internet. What about the kiosk, extension workers, and hard copy (pictorial) approach? Who relays info, important for different scales - e.g. small scale farmer and chief approach		
A capacity development, training and awareness initiative	Awareness training - for Prin Sec/Directors. To the farmers also learning about what is available to them. Must ensure that the training is used is supportive of indigenous knowledge and participation		

Further to the components requirements in **Table 1**, research requirements were outlined as shown in **Table 2** below.

Table 2 Sub-regional research requirements for Agriculture monitoring system

Crop type	Timing of crop type mapping through a combination of not only phenology, but combination of spectral & textural
	Crowd sourcing potential to have farmers SMS in their area and crops being planted
	App development for farm yield and farm details where a GPS location is required
	Consider the example of Malawi disaster mitigation for flood monitoring and reporting
Yield Data	Expand on the models developed by University of Zimbabwe to include climate & soils. Calibrated locally and at farming scale
Crop Condition	Make use of the AMESD models for national and see how it could be relevant and reported on at different farming scales
Planting & Harvesting	Something within the climate change research region to see how there is a fluctuation in planting/harvesting times

Data dissemination especially through mobile has been found to be very costly as even the commercial farmers are unable to afford the costs. This impacts easy access to information especially for crop monitoring. Governments need to negotiate with service providers to make these services available at affordable costs to farmers and government workers.

Coordination Framework

The workshop took notice that coordination is no longer an option, it is a must. It is crucial to ensure access and sharing of data, products, financial and human resources and minimizing duplication. National coordination is also envisaged to provide a mechanism to reach end-users. Some of the countries, such as Malawi, have clear data acquisition coordination through the Surveyor General (mapping agency). However the coordination taking into account the full EO value chain is not yet in place. It was noted that the role of Surveyor Generals is different to that which is played or can be played by remote sensing centres.

Bearing in mind that AfrigeOSS is an initiative not a project, aims to provide a coordination mechanism regardless of the project and funder and to provide ability to link existing programmes for beneficiation by other countries and institutions.

The envisaged coordination framework for AfrigeOSS is as follows:

- *Secretariat at continental level (AUC) – link to sub-regions and global community*



- *Secretariat at sub-regional (SADC)*
- *Secretariat at National level (without which the sub-regional and continental coordination are not sustainable)*

Countries provided initial Points of Contact (PoCs) for AfrigeOSS and GEOGLAM. The PoCs will start immediately to drive AfrigeOSS objectives through national coordination and expanding GEO membership. A Memorandum of Agreement (MoA) between MESA and AfrigeOSS will be drawn to further understand how the coordination within SADC could work.

Contribution to GEOSS

1. In preparation for GEO-XI Plenary in November 2014 in Gabon, the AIP team is looking to develop mobile application that answers a real life problem. A task team to write terms of reference for a crop monitoring mobile app. The app must provide information to the farmer or extension officer and the farmer or extension officer to upload information in the app. Possible this can be linked to the climate change information app by CSIR Meraka. **Due date for terms of reference, 30 May 2014.** The WG comprises of Zimbabwe (University of Zimbabwe, Amon Murwira, Lead), South Africa (DAFF, George Chirima), South Africa (SANSA, Nicky Knox), Malawi (MAFS, Joseph Kanyangalazi) and MESA office (Isaac Kusane to provide name). GEO Secretariat to provide coordination support.
2. Undertake a study to better articulate the benefits of data open access policies for countries / institutions to be convinced. The WG comprises of South Africa (SANSA, Clement Adjorolo), Malawi (Dept Surveys, Christopher Chiakonda), Malawi (MAFS, Joseph Kanyangalazi), Zambia (Evaristo Nyanoka), MESA (Isaac Kusane) and South Africa (Nicolene Fourie). GEO Secretariat to provide coordination support and link to GEO Work Plan (Task ID-01 Advancing GEOSS Data Sharing Principles).
3. Outlined components of the sub-regional monitoring system to contribute to GEOGLAM (Task AG-01 Global Agricultural Monitoring and early Warning)
4. AMESD and MESA products to be registered in the GCI (discovery through GEOSS Portal) and MESA to be used as platform for SADC member states to contribute to GEOSS (Tasks on Agriculture (AG-01), Climate (CL-01), Disasters (DI-01) and Institutional Development (ID-02))
5. Investigate the systematic use of GEONTCast to distribute tools such as software through out Africa, other dissemination services such as low cost mobile use. (Tasks IN-04-C2 and CL-01-04) and compilation of data archives by GEO for countries that can be made available through hard disks, MESA can provide hardware.
6. In support of the SPOT Archive (older than five years) offer by France, SANSA and University of Zimbabwe willing to contribute in making the data available for SADC (Task IN-01-C2)

All presentations are available on the GEO ftp site:

<ftp://ftp.earthobservations.org/AfrigeOSS/20140508-09%20SADC%20Workshop/>

