Regional Centre for Mapping of Resources for Development,

DRR Dynamics & EO African Scenarios

Byron Anangwe
Product Development Officer - RCMRD
Questions??

Farmers praying for rain in Allahabad on Thursday. A delay in the arrival of the monsoon in the north has raised fears of a drought. — Reuters (Reports on Page 13)
Questions??
What are the Issues?

- Proper Planning
- Sound policy formulation with implementation
- Timely service delivery to people
- Allocation of Resources
Disasters

- Droughts
- Land degradation
- Floods
- Landslides/Earthquakes
- Locust invasion
- Epidemics/Pandemics
- Other Man-made

Consequences:
- Famine
- Starvation
- Escalating poverty
- Reduced water availability
- Malnutrition
- Mass migration
- Deaths
- Conflicts
- Diseases

EM-DAT: The OFDA/CRED International Disaster Database
(http://www.cred.be ; email: cred@epid.ucl.ac.be)
Technology Vs DSS
GIS APPLICATIONS

Multi-concepts

Citizens
GOVERNMENT

Decision Support

Geographic knowledge / data

Real World
Mau Forest: 1986

- Forest
- Degraded forest
- Bare soil
- Other cover types

Mau Forest: 2010

Forest - 292,192.4 Ha (2,921.92 Km²)
Deforested – 142,879.4 Ha (1,428.794 Km²)
Reforested – 60,411.0 Ha (604.11 Km²)
Land Movement
Regional Multi-Hazard Atlas & Disaster Mapping Project

IGAD 2011 Drought Conditions

Flood Prone Areas - IGAD Region
SERVIR Applications have several dependencies:

- NASA Applied Science Program
  Agriculture, air quality, climate, disasters, biodiversity, public health, water resources

- GEO
  Agriculture, biodiversity, climate, disaster, ecosystems, and human health

- USAID
  Climate change adaptation, carbon tracking and GEO focus areas

- Regional Needs Assessment
Wireless Sensor Network (WSN)

- The network is comprised of individual nodes that are part of a peer-to-peer mesh

- Capable of operating for extended periods (weeks, months) with little to no maintenance

- Network can be put to ‘sleep’ ‘Typical’ configuration – soil moisture sensors, rain gauge, temperature sensor, accelerometer, river gauge sensor etc.

- Can be interfaced to any type of sensor to monitor the environment
Application of WSN

- Network installed at RCMRD and Kericho
  - 3 nodes (RCMRD) and 5 nodes (Kericho Kenya) with temperature, humidity, wind and rainfall Data available at:
- RCMRD Network:
- http://41.206.34.124/wsnrcmrd/SensorGraph.aspx
- Kericho Network:
- http://41.206.34.124/wsn/SensorGraph.aspx
SERVIR-East Africa has been running a water resource assessment tool, a distributed hydrologic model called CREST, for a large domain in East Africa using NASA remotely sensed datasets.

The purpose of the modeling effort is to empower the decision makers with timely information about the water resources conditions. SERVIR-East Africa has engaged the Ministry of Water Resources in Kenya and is reaching out to other countries.

SERVIR-East Africa has generated historic hydrologic model runs, is running the model in near real time and is working on getting the seasonal forecasts incorporated.
Predicting Flooding: Nzoia River Basin

Calibrated precipitation versus Runoff Graph

- 3B42RT's Precipitation
- Observed Runoff
- Calibration: 2

Discharge (m³/s)


Time Series (d)

NASA Flood Potential Map for Africa

Welcome to SERVIR-Africa.net

SERVIR Africa - Using seasonal data to serve Africa

Home  SERVIR Data  Online Map  SEOSI Decision Support  3D Visualizations

Home  SERVIR Data  Online Map  SEOSI Decision Support  3D Visualizations

About SERVIR-Africa  Gallery  Directory  Partners  Site Map  Reference Material  SERVIR Internal  Contact Us

NASA Flood Potential Map for Africa

Low Risk Flood Potential

Moderate flood Potential

High Flood Potential

Natural Hazards

Earthquakes

Fires
CREST Viewer Interface
CREST Web Access
(CREST Viewer)

- \textcolor{red}{http://41.206.34.124/crestviewer/}
- Or
- \textcolor{red}{http://ags.servirlabs.net/crestviewer/}

CREST Web Access
(Daily CREST Map Books)

- \textcolor{red}{http://41.206.34.124/crestmaps/}
- These map books are available for free download
UNOSAT/IGAD/RCMRD Initiative on DRR & Emergency Preparedness

- Capacity Building in Geo-Information
- Testing of New Technologies
  - UAV
  - Livestock Tagging
- Developing Alternative Livelihoods
- Crowdsourcing & Mapping
  - Geo Tagging
- Satellite Disaster Charter Engagement
Alternative Livelihoods
Disaster Related Space Activities at the RCMRD
# Earliest Activities at the RCMRD

<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1988 - 1993</td>
<td>Qualitative analysis of CCD for food security assessment in the IGAD countries. Funded by the Japanese Govt. through FAO in the project GCPS/RAF/231/PJN.</td>
</tr>
<tr>
<td>1996 - 1997</td>
<td>Qualitative analysis of CCD and NDVI in the IGAD countries and Rwanda and Burundi. Funded by the French Govt. through FAO in the project GCP/RAF/310/FRA</td>
</tr>
<tr>
<td>1995 - 2000</td>
<td>Qualitative end of season crop yield forecasting and environmental analysis in the IGAD countries using ET data derived from Meteosat satellite. Co-executed by RCMRD and EARS and funded by the Dutch Govt. In the REFEWS Project.</td>
</tr>
</tbody>
</table>
RCMRD Activities on DRR

- **Food Security and environmental monitoring**
  (USGS/Fewsnet, ICPAC, DLCO, WFP, ILRI, LEWIS, GMFS)

- **DRASTIC Modeling, CREST Modeling, Flood Modeling and Prediction**
  (USGS, NASA, EU)

- **Disease Modeling and Prediction**
  - Rift Valley Fever (WRI, AU-IBAR, UoN, USGS)
  - Mapping of HIV/AIDS on the Mombasa – Kampala highway (Manitoba University, UoN)

- **Land Suitability, Land degradation mapping and monitoring**
  - Deforestation (Mau Forest)
  - Land use / Land cover change (Kordofan Region, South Sudan)
  - Uganda

- **Capacity building**
  - Training in the use of modern Geo-information technologies in early warning & food security, disease mapping, land degradation, disaster risk management

- **Monitoring urban sprawl & Camp Mapping** (Informal settlements)

- **Policy Development for Space Applications**
Conclusion

For space technology usage to become operational in resource mapping and assessment and in environmental mapping and disaster management:

• there is need for aggressive and sustained awareness creation among decision makers

• Increasing Capacity at a national level

• Development of a variety of space technology applications

• Research, Development & innovation in space technology applications

• Support of National and Regional Initiatives
**REGIONAL CENTRE FOR MAPPING OF RESOURCES FOR DEVELOPMENT**

**VISION**
To be a premier Centre of Excellence in provision of Geo-information services

**MISSION**
To promote sustainable development through generation, application and dissemination of Geo-information and allied ICT services and products in the Member States and beyond

**SERVICES**
- Geographic Information Systems
- Surveying & Mapping
- Capacity Building: IT, GIS, RS, GPS etc.
- Remote Sensing
- Repair of Surveying Equipment

**APPLICATION**
- Disaster Management
- Health
- Energy
- Climate
- Geology
- Agriculture
- Ecosystems
- Biodiversity
- Water

[Map of Africa showing Contracting and Non-Contracting Member States]
RCMRD Roles:

• Promote Awareness of Sat-tech & Applications

• Project Implementation & Building Capacity

• Formulation of spatial policies and data infrastructure

• Creation of national and regional partnerships
Regional Centre for Mapping of Resources for Development (RCMRD)

Kasarani
+254-20-8560227/1775

Byron Anangwe
banangwe@rcmrd.org
You have 5 seconds to interprete the following scene
You have 3 seconds to interprete the following scene