

The African Monitoring of Environment for Sustainable Development (AMESD) program and its Links with Disaster Risk Management Issues

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African Monitoring of the Environment for Sustainable Development

Workshop UN-SPIDER, Addis Ababa, 6 July 2010



• A partnership between the RECs, ACP Secretariat, AUC and EU

• A continental wide, pan-african project for the development of geoinformation services



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AMESD political framework

African Union Commission

Management





European Union Commission 9th EDF Funding

5 Regional Economic Communities CEMAC, ECOWAS, IGAD, IOC, SADC

+ ACP Secretariat Guidance

International partners (JRC, Eumetsat, WMO, UNEP, UNECA, FAO) Cooperation



AMESD operational objectives

Result 1 : <u>Improved access</u> by African users to existing basic Earth observation, field and ancillary data

Implementation of ~50 AMESD reception stations (one per African country)

 Result 2 : <u>Operational information services</u> are established to improve decisionmaking processes in the fields of environmental management and other policies
 > Implementation of 5 geoinformation services (THEMAS) (one per Econ. Region)

Result 3 : <u>Political and policy development</u> frameworks are strengthened to ensure active and sustainable participation of African governments in global environmental surveillance.

> Through the organisation of fora to raise awareness, and of high level meetings for the preparation of next steps

Result 4 : <u>An adequate technical level of AMESD African stakeholders is</u> permanently ensured

> Onset of a large training plan at continental, regional and national level



The first AMESD reception station is inaugurated by the African Union Commission President Jean Ping and REA Commissioner Rhoda Tumusiime on April 29, 2009 in Addis Ababa



AMESD Programmatic aspects



- The AMESD Program is
- The Follow-Up of the PUMA Project
 Deployment of 55 PUMA stations, in 46 African National Meteo Services



 The Preparation of GMES Africa
 AMESD may be seen as a "building Block" for GMES Africa



- Timeframe for implementation: 2008-2013
- Overall budget : 21 M€



AMESD THEMAS

Regional Economic	Regional Thematic	Regional
Community - REC	Action	Implementation Centre
CEMAC	Management of Water Resources	CICOS (Commission Internationale du bassin Congo- Oubangui-Sangha), Kinshasa (DRC)
ECOWAS	Water Management for Cropland and Rangeland Management	AGRHYMET (Centre Régional en agro-météorologie et hydrologie), Niamey (Niger)
IGAD	Land Degradation Mitigation and Natural Habitat Conservation	ICPAC (IGAD Climate Predictions and Applications Centre), Nairobi (Kenya)
IOC	Coastal and Marine Management	MOI (Mauritius Oceanography Institute), Quatre-Bornes (Mauritius Island)
SADC	Agricultural and Environmental Resource Management	BDMS (Botswana Department of Meteorological Service), Gaborone (Botswana)







Training and Capacity Building

Capacity building is an essential component of AMESD

emphasis on training of trainers

	System administration	Thematic	Other
Continental	PUMA and AMESD system administration : training of trainers 20	PUMA application software : training of trainers 20	EDF Rules 50
	PUMA and AMESD system administration 110	PUMA application software 110	
	AMESD system administration : on site training 100		
Continental & Regional		Use of e-stations : training of trainers 9	
		AMESD Products and Services : training of trainers 20	
Regional		Use of e-stations 109	
		AMESD Products and Services 124	
		Specific additional thematic training on	Sensitisation of decision
		EO techniques 193	makers 100
		THEMA Applications 66	
National		AMESD Products and Services 600	

Program status (1/2)



Done

Preparation of THEMAS (circular missions, regional workshops, Grant preparation)

Contract Signatures for all THEMAS

□ for AGRHYMET and MOI : Fall 2009

□ for CICOS, BDMS and ICPAC : May 2010

AMESD stations installed in Addis PCT + RICs

Contract for AMESD and upgrade PUMA station deployment signed in Fall 2009

□ Contractor : Telespazio-France

□ Factory test of new stations performed in Toulouse in May 2010

Deployment started in May 2010

Governance implemented (Program Steering Committee operational)

Continental & Regional Training started





- Sensitization of AMCEN Ministers (Result 3)
- First Forum of AMESD Users (Kinshasa, December 2009)

To be done

- In all THEMAS : development & delivery of information products & services (up to end 2012 – mid 2013)
- Implementation of the Continental and Regional Training Plans (up to Fall 2011)
- Deployment of all AMESD and upgraded PUMA stations (May 2010 March 2011)
- Completion of the Continental & Regional Training Plan
- Implementation of a Communication Plan
- Workshops of sensitization of decision makers in the five RECs (Result 3)
- Demonstrative action on the continentalisation of products and services
 - Second Forum of AMESD users (Summer 2011)



Region CEMAC: Management of Water Resources

Associated countries

 Cameroon, Central African Republic, Chad, Congo, Democratic Republic of Congo, Equatorial Guinea, Gabon

Regional Implementation Centre (RIC)

International Commission for Congo-Oubangui-Sangha Basin





Service 1 "Low waters"

- Products : Water levels (sat and in-situ), Oubangui sub-basin
 - Low waters alert system, Oubangui sub-basin
- Near real time, EUMETCast and internet
- Key users : Navigation services



Food security: beef transportation from Bangui to Brazzaville on the Oubangui and Congo rivers





Spatial altimetry on Congo river

Region CEMAC



Temporal diagram of average discharge deviation on Oubangui river in Bangui



Service 2 "Water Cycle"

- Products : Rainfall, Evapotranspiration (sat and in-situ), Oubangui sub-basin
 - Water cycle / Humid Forests monitoring bulletins, Oubangui subbasin
- Offline, EUMETCast or internet
- Key users : Ministries, Universities and Research centres, Agropastoral services, etc.





ECOWAS : Water Management for Cropland and Rangeland Management

Associated countries

 Mauritanie / Sénégal / Gambie / Cap Vert / Guinée Bissau / Guinée Conakry / Sierra Léone / Libéria / Cote d'Ivoire / Ghana / Togo / Bénin / Nigeria / Tchad / Niger / Burkina Faso / Mali

Regional Implementation Centre (RIC)

Centre Régional Agrhymet (CRA)





Service « Production and Distribution of indicators for 4 environmental themes chosen by the users »:

- estimation of yields of cultural and pastural land
- dryland areas and drought risks
- filling levels of small water bodies to support livestock management
- savannah fires

- Key products : Vegetation state, Dry matter productivity, Phenology, Fraction cover, small water bodies, active fires, burnt areas, and bulletins
- Distributed in near real time by EUMETCast and internet
- Key users : ECOWAS, CILSS, International and regional organisations, national authorities

ESD **ECOWAS example : Vegetation and Drought monitoring** ICN 2008 0-20 21 - 40 41 - 60 61 - 80 81 - 100 > 100 **Normalized Vegetation Growth Index**

Chad – May 1 to Aug 10, 2008





Region IGAD : Land Degradation Mitigation and Natural Habitat Conservation

Associated countries

 Djibouti, Eritrea, Ethiopia, Kenya, Somalia, Sudan, Uganda

Regional Implementation Center

ICPAC (Kenya)





Service 1 "Land Degradation Assessment"

- Key Product : Land Degradation Index Map (LDIM) over IGAD region, and regular bulletins
- Distributed biannually through Eumetcast, Internet
- Key users : National Ministries of Environment, Meteorological Services, IGAD Secretariat, Regional institutions,
 Researchers



Region IGAD



Natural Habitat Conservation (Mau Forest-Kenya)



Service 2 "Natural Habitats Assessment"

- Key Product : land cover change at high resolution on IGAD selected Natural Habitat areas.
- Distributed annually through Eumetcast and Internet to national focal points
- Key users :National Ministries in charge of Environment –, IGAD Secretariat, IUCN, WWF,

Deforested area = 824.683 Km² Average rate of deforestation = 58.906 Km²/year



Region IOC: Coastal and marine management

Associated countries

 Maurice, Madagascar, Seychelles, Comores, La Réunion Kenya, Mozambique, Tanzania

Regional Implementation Centre

Mauritius Oceanography Institute





Service 1 "fish resources monitoring"

- Products : ocean color, sea surface temperature, sea-level, South West Indian Ocean, waves (sat and in-situ), marine currents, SWIO
- Additional products : fish resources indicators
- Near real time and offline, EUMETCast, internet
- Key Users: Ministries and institutes of fisheries, Fisheries Monitoring Centres

Service 2 "Data base in physical oceanography"

- Products : sea-level, marine currents (numerical model), waves (in-situ), SWIO
- Additional products : climatological parameters: sea level elevation , wind and surge frequencies, SWIO
- Offline, EUMETCast, internet
- Key Users : Oceanographic institutes, marine operators

Region IOC: some examples



Service 1 "fish resources monitoring"







Service 2 "data base in physical oceanography"







Chlorophyll concentration in the SWIO



Potential Fishing Zone in SWIO



visualization of marine currents



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Region SADC: some examples

Service 1 "Agricultural Service"



Service 2 "Drought Service"



Support Service "Seasonal Range Forecast"



Enables to provide Seasonal outlook for core services





Links with Disasters and Climate Change

The THEMAs are related to

- Climate Change : through the construction of historical archive data characterizing the environment, which document the climate change and its induced effects on the environment
- Disaster Risk Management : through the near real time availability of environmental data. Examples :
 - □ River Water level (CICOS) and its relation with Flood risk
 - Drought indicators (AGRHYMET)
 - □ Fire indicators (BDMS)

Rest of presentation : illustration of activities on droughts and fire indicators



Strategy based on the monitoring of vegetation

Using anomaly indicators derived from the NDVI

AMESD challenge

- Integrate these tools in surveillance systems of regional institutions
- Facilitate their use by decision makers

In 2009, AGRHYMET published two bulletins which permitted to announce the severe production crisis in West Africa 4 to 6 weeks before all other early warning systems (FAO, FEWS, PAM, etc)

- End of August 2009 : signal of a bad beginning of the rainy season in Niger, Chad, North-Mali and East Burkina Faso
- End October 2009 : confirmation of the bad conditions in Niger, Mali and Chad

In March 2010 a large humanitarian help program started in Niger and Chad

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Vegetation Condition Index 1rst decade October 2009 in South Niger. It expresses (in %) vegetation growth at a given time relative to the maximum growth registered during the historical record at the same date.



Vegetation growth anomaly 1rst decade October 2009 in South Niger. It expresses anomalies of vegetation growth in terms of their frequency on the historical record.

MESD

Example : the SADC THEMA Fire Alarm system



The AMESD Programme intends to extend to the whole SADC Region the Advanced Fire Information System (AFIS) that has been implemented by CSIR Meraka Institute (South Africa) for South Africa

1)The AFIS system ingests in CSIR satellite based products such as the MODIS and MSG active fire product (via EUMETCast)

2)Daily fire danger index forecasts **are computed and then disseminated** with EUMETCast in near real time to the Fire Fighting operations centres.



Nelspruit Fire Fighting Centre setup



Setup of AFIS field terminal at Nelspruit Fire Fighting Centre (east of South Africa)



2.1 m C band antenna EUMETCast station control centre with 2 LCD screens displaying AFIS and the MSG cloud animations





AFIS/WOF Viewer ¥1.03

AFIS field terminal products

Fire Danger Forecast





Active fire detections in plantations around Nelspruit - 9 April 2009

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