

In this special issue ,what MESA is delivering to its end users in different thematic actions is featured.



Extreme weather events, climate change, land degradation, droughts and floods adversely affect the planet. Africa is particularly experiencing some of the gravest consequences on its ecosystems, productive systems, and ultimately on the socioeconomic development of its people. In order to improve socioeconomic conditions of the people through food security, improved environmental and natural resources management, disaster preparedness and risk reduction, Africa , through the MESA project, utilises Earth Observation ,satellite technologies to generate critical products and information services for socioeconomic development.

The MESA Project currently delivers products and operational services to African users in the following thematic areas such as: agricultural production; monitoring and assessment of droughts; wildfires; land degradation mitigation; coastal and marine resources management; water resources management; natural habitat conservation; rangeland management; and forest monitoring. Listed below are some of the MESA products and services for different socioeconomic development sectors.

### MESA services for the agriculture sector in the SADC Region

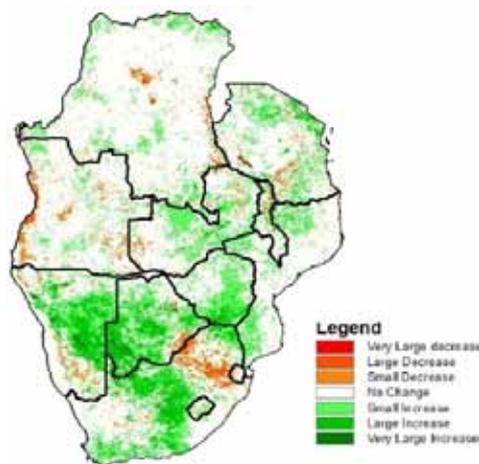


Fig 1 MESA SADC NDVI difference map

The MESA SADC Agriculture Service provides tools to monitor crop and rangeland conditions during the growing season and to forecast yields and simulate production scenarios. The products generated through the MESA station assist planners and decision-makers to answer questions such as: What crops grow where? What is the crop or rangeland condition? What is the crop stage? What is the likely yield? Fig 1 provides information on vegetation growth performance compared to the long term average. White colour indicates normal vegetation growth, red shades indicate bad vegetation growth and green indicates good vegetation growth.

The service is contributing to food security and economic development by providing tools to calculate food surpluses and deficits to guide import requirements, export potential and price decisions.

MESA SADC thematic action is implemented by BDMS/SADC-CSC and providing services on: Agriculture, drought, wild fire and flood for the SADC region. For more information please visit [www.mesasadc.org](http://www.mesasadc.org)

### MESA Products for MARINE AND COASTAL resource management in the IOC region

The biological and physical characteristics of the waters in the South West Indian Ocean region are not well known because of the scarcity of relevant information. The monthly oceanography bulletin delivered under the MESA-IOC thematic action attempts to make up for this by providing a value added product with a first level of interpretation of chlorophyll, sea surface temperature and sea surface height variability in the region coupled with primary production information.

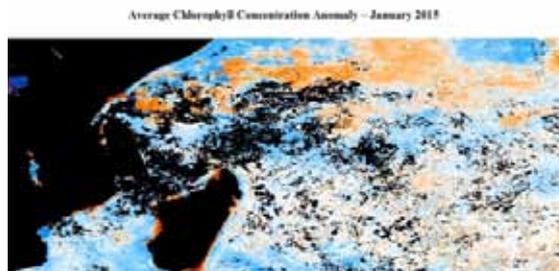


Fig 2 MESA IOC Thema Product

This product gives a global view of the biological and physical “state” of the ocean from which abundance, biomass and production of fish could be inferred. In order to produce maps of potential fishing zones for use by government organisations.

MESA IOC Thematic action is implemented by MOI and provides services on Marine Resource Management and Monitoring of Coastal Environment

### Crop and rangeland monitoring for the West African Countries

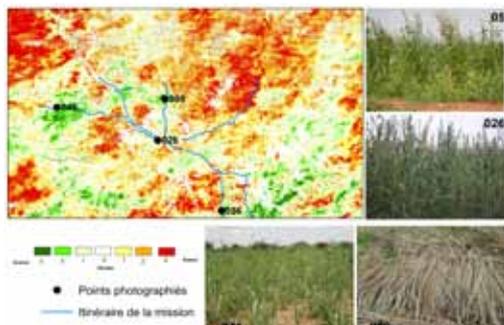


Fig 3 Productivity assessment report

Early information on potential risk of crop failure, or high crop productivity is important for food security issues. Earth Observation plays a crucial role in this regard. The MESA ECOWAS Land thematic action, using satellite and field based information, is providing crop and rangeland monitoring products to MESA focal point institutions in the ECOWAS Member States, Mauritania and Chad. The products are delivered to end users in the form of bulletins, maps, advisory notes and productivity assessment reports.

For instance, a productivity assessment report informs end users, one to two months before harvest, of the state of major crop yield for each ECOWAS Member State country, at province level. It also informs the status of rangeland biomass quantity every 10 days and before the dry season for pastoral management. The impact analysis is a main assessment tool to determine the number of villages, animal and people living in difficult conditions in the area identified with MESA products for fodder biomass or crop production. It is used as an input for emergency planning and decision-making systems at ECOWAS, Mauritania and Chad level.

MESA ECOWAS Land thematic action is implemented by AGRHYMET and providing crop, rangeland and bush fire services. For more information please visit [www.agrhymet.net](http://www.agrhymet.net)

## MESA Products for Land Degradation Assessment in the IGAD region

MESA products and services enable end users in the IGAD region and member states to access current information on pasture availability, forest degradation and general land degradation. It also boosted conservation efforts to help wildlife protection and management.

Land Degradation Index Map (LDIM) is one of the products at MESA IGAD thematic action. It provides an indication of the risk of land degradation at low resolution at national and region levels as well as at high resolution over selected areas (“hot spots”). Fig 4 shows levels of land degradation in the IGAD region.

The assessments of IGAD Protected Areas (PA) is also featured in the bulletins



Fig 5 MESA Continental Environmental Bulletin

## MESA for Water Resources Management in Central Africa

MESA is providing water level alert information for navigation and water cycle monitoring in the Oubangui, Kasai and Sangha sub basin for central Africa. The information generated are helping water resources management in CEMAC Member States: Cameroon, Central African Republic, Congo, Gabon, Equatorial Guinea and Chad for planning and implementation of environmental resource management and policies.

Hence, through MESA Project, the Central African Region monitors changes in water levels and water balance of the basin. These are useful to assess the impact of deforestation and climate change on water resources, environment and on the community.

The MESA CEMAC thematic action is implemented by CICOS

and enables users to monitor and prioritise the areas according to biodiversity values and threats.

The MESA IGAD thematic action is implemented by ICPAC and is providing services: Land Degradation Assessment, Natural Habitat Conservation Assessment and Forest Monitoring services for the IGAD region. For more information please visit <http://mesa.icpac.net>

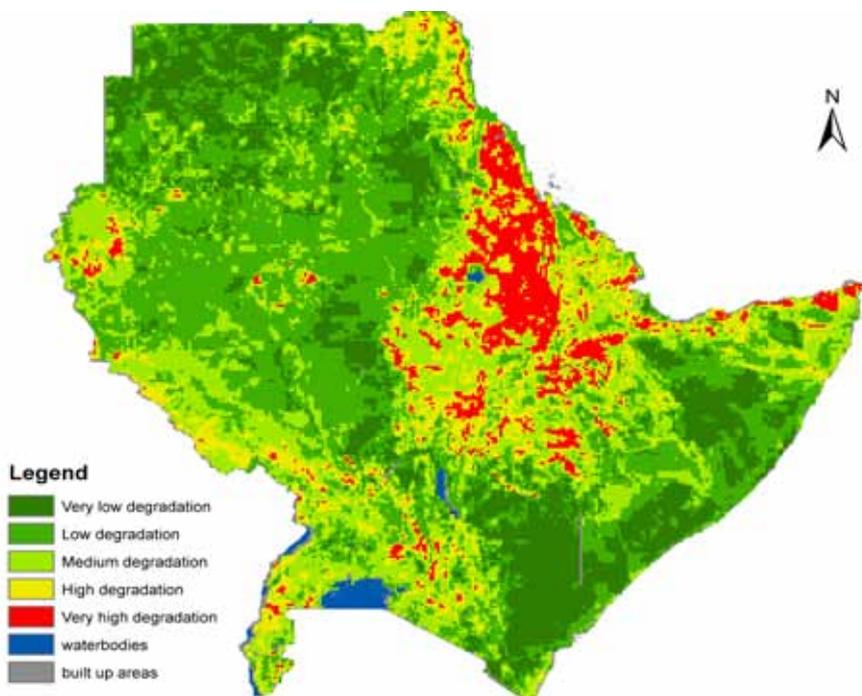


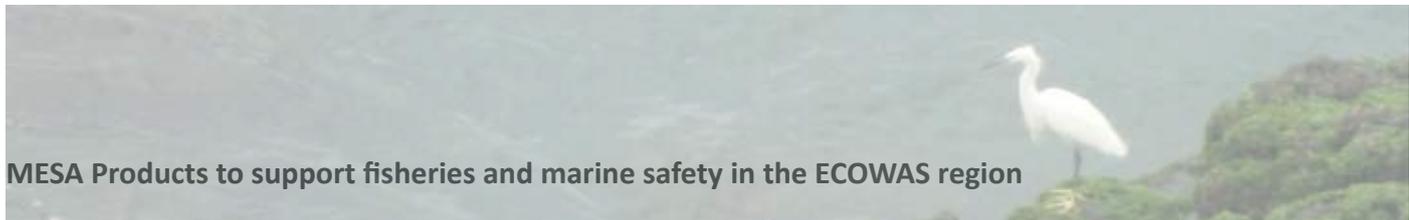
Fig 4. MESA IGAD Thema product for Land Degradation

## MESA Continental Environmental Bulletin

In an effort to provide African decision-makers and planners with current information outlooks for environmental purposes, the MESA project, publishes the biannual Continental Environmental Bulletin. The Bulletin summarises seasonal environmental and agricultural information on the African continent for the applications of both marine and land resources.



Fig 6 Sub basins of the Congo River



**MESA Products to support fisheries and marine safety in the ECOWAS region**

MESA ECOWAS Marine Thema uses Earth Observation (EO) data and other related fisheries statistics to provide information on ocean conditions and fish distribution dynamics in the marine and coastal areas of Western Africa. It is providing information on locations of potential fishing spots where there is a high chance of finding fish.

Information on ocean waves, currents, winds and sea surface heights is very important to ocean farers for effective navigation and safety at sea. This is crucial as ocean transportation remains the main means of transport of goods and services. Ocean state products inform users about their safety at sea and help plan on the safest routes and times of embarkation. This is especially useful to artisanal fishers who are most often at the mercy of the weather and use less sophisticated equipment, making them vulnerable at sea.

Forecasting of ocean weather is done for a 6-day period with a nowcast product for the present day. The forecast products include daily means of ocean surface parameters which are Sea surface currents (SSC), Sea Surface Heights (SSH), Sea Surface Temperatures (SST) and Sea Surface Salinity (SALT). The geographical area covered by the forecast products generated by UG-MESA includes the coastal and oceanic waters of western African countries.

MESA ECOWAS Marine thematic action is implemented by the University of Ghana and provides information services: Support to fisheries resource management and forecast of ocean weather for the ECOWAS Region.

For more information please visit [www.ug-mesa.org](http://www.ug-mesa.org)

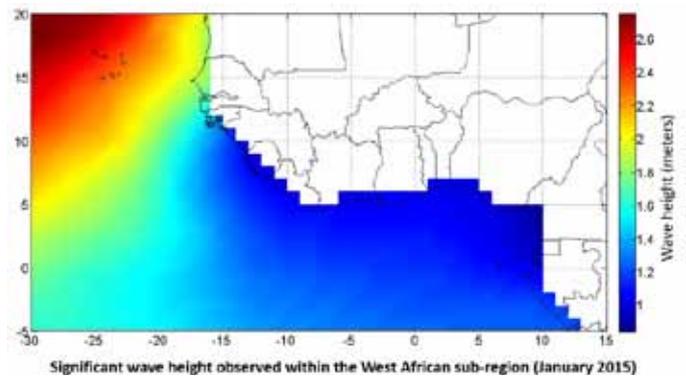


Fig 7 MESA ECOWAS marine Thema Product for marine safety

**The MESA Project**

The MESA Project is a European Union funded Programme (37 Million €, 2012-2017), implemented with the overall coordination of the African Union Commission and steering by the Regional Economic Communities (CEMAC, ECOWAS, IGAD, IOC and SADC) and the ACP Secretariat, in close cooperation with the European Union Delegation to the African Union and partners such as EUMETSAT and the EC Joint Research Centre.

The Project is implemented by the African Regional Economic Communities (RECs) through their specialised technical institutions including the Botswana Department of Meteorological Services and SADC Climate Services Centre for the Southern Africa Development Community (SADC) region, the International Commission for Congo-Oubangui-Sangha Basin (CICOS) for Central Africa, the AGRHYMET Regional Centre for the Economic Commission for West African States (ECOWAS), the IGAD Climate Prediction and Applications Centre (ICPAC) for the Intergovernmental Authority on Development (IGAD), Mauritius Oceanography Institute (MOI) for the Indian Ocean Commission (IOC), University of Ghana for the ECOWAS, and the African Centre of Meteorological Applications for Development (ACMAD) provides climate services for disaster risk reduction for the African continent.



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