Remote Sensing Information Systems in Support of Resources and Environmental Management

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CRTS : Missions and roles

- Developing scientific research in space science and technology
- Development of operational uses of space technologies in the areas of economic development and natural resource management.
- Facilitating access to satellite data and imagery
- Development and strengthening of national scientific and technical capabilities in space technology and remote sensing
- To contribute to Morocco's representation in international institutions and organizations and to establish international cooperation partnerships
- To promote awareness of the importance of space and facilitate the exchange of information
Space technologies in support of sectoral development strategies

- National Strategy for Sustainable Development
- Geological Mapping Plan
- Digital Economy Plan
- Green Morocco Plan
- Water Strategy 2030
- National Strategy For Renewable Energy
Value Added Services to Support The User Community

- Ministry of Agriculture
- Irrigation Agencies
- Ministry in charge of fisheries
- National Agency of Aquaculture
- National Agency of Harbors
- Fisheries National Office
- Ministry of Water Resources
- Basin Agencies
- Waters
- Ministry of Interior
- Royal Police
- Regional Governorates
- Civil Protection Department
- Ministry of land Management
- Urban Planning Agencies
- Local Authorities
- Private companies
- High Authority in charge of Forest resources
- Regional Direction
Water and Sanitation Planning
Urban Development Management

End user

Société d’Amenagement Ryad
Urban Development Management
Urban extension control to assist local authorities

Extension (cas du douar Brahma)

- Situation 2001
- Extension 2005
- Extension 2006
Forest resources management
Forest resources inventory
Forest Resources Management
Forest Cover Change Mapping
Agriculture Resources Management
Urban growth impact on arable lands
Agriculture Resources Management

Regional land use maps
Agriculture resources management

Monthly EO based Bulletin for crop monitoring and provides early insights on anomalies in crop condition aiding food supply and forecasts cereal production.

End user

- Ministry of Agriculture
- Ministry of Interior
- Agriculture Development Agency
- Central Bank
- Insurance companies
- Research Community
Aquaculture Zones Identification

Fisheries Management Planning

Temperature

Salinity

Oxygen

Chlorophyll a

End user
Water Resources Management
Monitoring of Irrigated Zones Extension
Land cover / Land use map

End user

Summer 2006
Water Resources Management
Monitoring of Irrigated Zones Extension

Possible Changes
- Forestation
- Mise en culture borie
- Mise en culture de haute montagne
- Changement de mode de culture
- Mise en culture privée permanente
- Mise en culture public moderne
- Mise en culture public traditionnelle
- Mise en culture privée temporaire
- Mise en eau
- Urbanisation
- Stable

Change analysis
Identification of favorable sites for water drilling

Water Resources Management: Access to drinking water

End user
The Regional Coordination Project to improve Water Resources’ Management and Capacity Building

LDAS-MOROCCO
Integrating Remote Sensing Data in Water Resources and Agriculture Management

World Bank

USAID
LDAS-Maroc project partners

• Institutional Partners
  
  CRTS  
  DRPE  
  DIAEA

• International/ National expertise
  
  NASA  
  USAID  
  THE WORLD BANK

  National Drought Mitigation Center  
  University of Maryland  
  University of Wisconsin  
  Johns Hopkins University  
  ICBA  
  TU WIEIN  
  cirad  
  INSEA  
  ITC  
  University of Twente
LDAS-Maroc Components

LIS Platform

In-Situ Data & EO

LIS Core

Outputs Hydrologic Parameters

Thematic Components

Geo-Indicators: Vegetation Indices, Soil Humidity, Eta etc.

Thematic Components

Water
- Current Situation
- Past Conditions
- Future Conditions

Drought
- Indicators
- DEWS

Floods
- Hydorologic Modeling
- Rapid Mapping

Loust
- Indicators
- EWLM

Irrigation
- Water Use/requirement
- Scenario Development
- Biomass Production

Dissemination Platform
Infrastructures du Projet LDAS-Maroc

Plateforme LIS
Plateforme CREST
Plateforme Irrigation
Plateforme POETS
Plateforme HRMFT
Modèle Risque Agricole
Modèle CREST
Cartographie des cultures irriguées
Cartes de l'Evapotranspiration
Carte de l'Évapotranspiration
Cartes de l'Évapotranspiration
Cartes de la Sécheresse

• Production des paramètres hydrologiques
• Bilan Hydrique Naturel
• Indicateurs Thématiques (SPI, IS, NDVI, ET)
• Indice Composite de la Sécheresse

Prévision Inondation
Cartes des zones inondées
Cartographie des cultures irriguées
Cartes de la Sécheresse
Cartes de probabilité de présence des criquets
Soil moisture anomalies in root’s layer from LIS/NOAH model for dry and humid periods over Morocco (climate anomalies over 030 years).
Composite Drought Index map for a dry year (Agricultural season 2011-2012)
Maps of probability of presence of locust (solitary and gregarious) for a 40 days period starting from 16 January 2015
IRRISAT Maroc
Earth Observation Based System for Irrigation Water management
The IRRISAT-Maroc project Provides support to

<table>
<thead>
<tr>
<th>users</th>
<th>Covered areas</th>
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<tbody>
<tr>
<td>Farmers</td>
<td>Parcelle</td>
</tr>
<tr>
<td>Agriculture development offices</td>
<td>Sector/ irrigated perimeters</td>
</tr>
<tr>
<td>Basin Agencies</td>
<td>Basin/Sub-Basin</td>
</tr>
<tr>
<td>Ministries (Water and Agriculture)</td>
<td>National scale</td>
</tr>
</tbody>
</table>

- To improve Crop water productivity
- To evaluate water saving mechanisms
- To support Water Accounting Systems
La production globale (Kg/ha par jour) pour chaque parcelle
La quantité d’eau journalière consommée par les cultures dans chaque parcelle
Mapping and follow-up of flooded areas
Région du Gharb, Jan-Mars 2010
Building damages modeling
TSUNAMI Hazards
Rabat-Salé Region

SCHEMA project (n° 030963)
Scenarios for Hazards-induced Emergencies Management

Centre Royal de Télédétection Spatiale
Tsunami floods modeling
Building Classification: Damage levels
Capacity Building: Training, R&D, Outreach
Training and R&D activities

Objectives: Enlarge users community and enhance national capacities

- Dedicated infrastructures
- Annual program: Up to 10 training sessions / Year
- Beneficiaries: National and from the region
- Cooperation with international organizations (ESA, FAO, COSPAR, ECSL, UNESCO/IOC, OADA, CRAST-LF…)
- More than 2,000 people benefited from this training programs
The comprehensive programme will include high-level keynotes and round tables focusing on:
спасибо  谢谢
GRACIAS
THANK YOU
ありがとう こうざいました  MERCI
DANKE  धन्यवाद
شكراً  OBRIGADO