CRTS

UN/AUSTRIA SYMPOSIUM

« Access to space: Holistic Capacity Building for the 21st Century »
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Capacity building in Earth Observation in Morocco: objectives and achievement by Royal Centre for Remote Sensing

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Royal Center for Remote Sensing, MOROCCO

MAIN GOAL

The Royal Center For Remote Sensing (CRTS), Rabat, was established in August 1988, and fully operational in january 1990, to promote remote sensing technology and develop applications for use in operational agencies and ministerial departments for more effective management of agriculture production, natural resources, environment, disaster, and territorial development of the country.

CRTS missions

- Promotion and integration of Earth Observation technologies to enable Morocco to effectively use and exploit satellites data and applications **to meet needs of users and decision makers** involved in Socio-economic and development projects at the national level

- **Centralize and Coordinate satellite data acquisition and management** to facilitate to all users an ***easy*** and ***rapid access*** to space and satellite data adapted to their ***needs*** and ***requirements***.

- **Capacity Building and Human Capital development** to maximize the use of Remote Sensing in the country by providing ***of training and education*** opportunities in Earth Observations Science and Technologies and Carrying ***out R&D actions and programs***

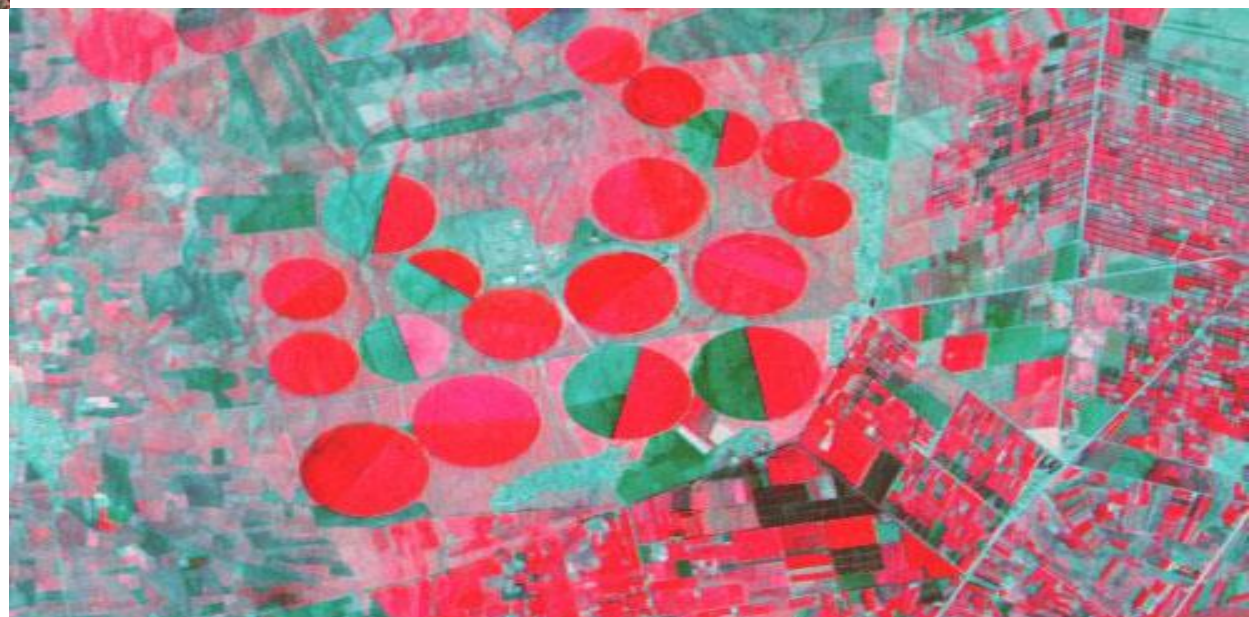
- **Raise awareness** the understanding and the interest of remote sensing technologies among decision makers, students and general public

Operational applications to support strategic decisions

To support ministerial departments in various fields :

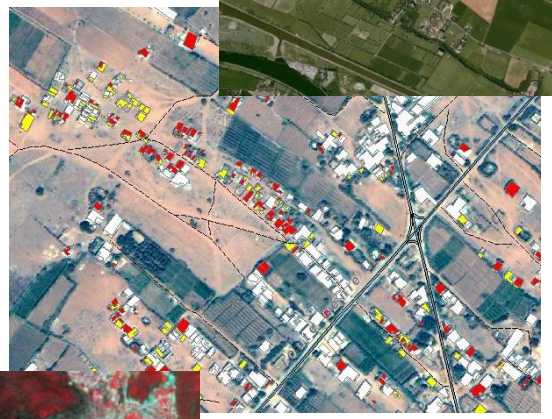
- Agricultural statistics and production forecasting
- Water resources management
- Forest and pastoral resources assessment
- Urban and land management

- Space cartography and geomatics
- Environment and hazards
- Geological applications
- Oceanography, climate and marine resources



Example of projects depending on the final users (1)

For Sectorial strategic orientation from ministeriel departments



➢ Agriculture département :

» - Strategic agricultural plan : Plan Maroc Vert

» - National Farm Register used for Morrocan agricultural socio – economomic development.

» - THR Satellite images from Pleiades and Spot 6,7

» - Area: 80.000 km2

➢ Territorial and land planning department :

- Monitor and analyse the development of illegal housing in suburban areas
- 35 cities in Morocco
- From 2007 à 2012 with a 3 months periodicity
- THR Imagery

➢ Forest départements:

- National Forest Resources Inventory
- 75 % of Moroccan territory
- Satellite Imagery HR and THR

Example of Projects depending on the final users (2)

Operationnal level/ regional and local agencies

➢**Water Agencies** :

➢ Establishment of base maps of the action area that will be used as a reference for the control and re-balancing of the ground water level. Scale 1/10.000, satellite imagery SPOT 6, 7 (in collaboration with GIZ)

➢ Daily Evapotranspiration indicator for optimizing the irrigation and participate to implementing the national strategy based on water saving.

➢**Agriculture Agencies**:

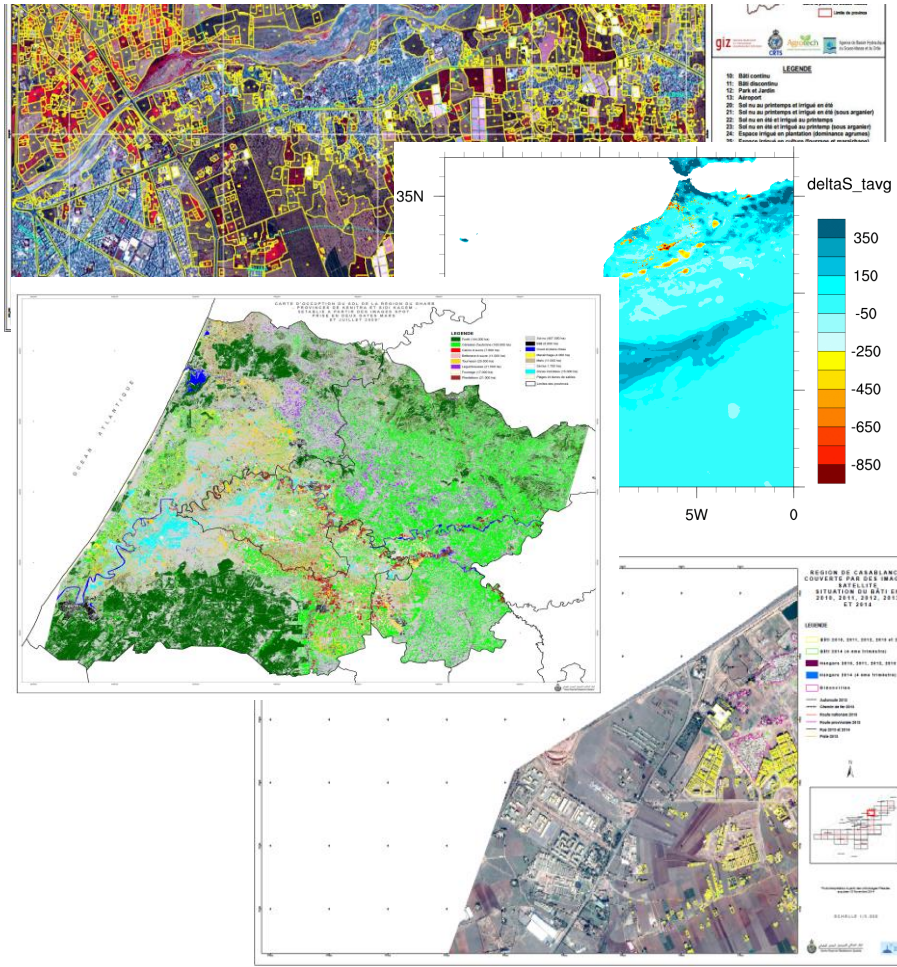
➢Detailled land use map, Scale 1/10.000, used for annually agricultural statistics on the region

➢Map of crops irrigated by pumping used for estimating quantities of pumped water

➢**Urban Agencies**:

➢ Monitoring the built quaterly , since 2010 to today.

➢ THR satellite imagery

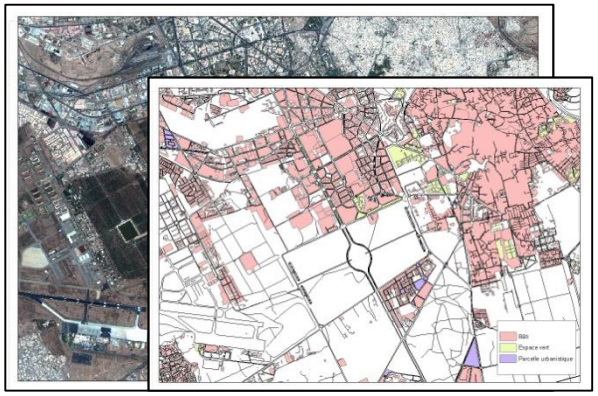


Example of projects depending on the final users (3)

Private agencies

- **TANGER MED: port infrastructure**
  - Monitoring and evaluation the impact on the environnement (agricultural, forest, littoral…. Impacts)
  - THR Satellite Imagery, pleiade, annually

- **AL OMRANE: urban infrastructure (new cities)**
  - monitoring and evaluation of the projet evolution compared to the initial implementation schedule



- **RADEEMA : water and electricity distribution agency, marrakech**
  - updating of building plans for the optimization of distribution networks

Main Objectives of capacity building for institutions

The CB should allow an institution:

- **to improve** its capacities to perform their missions by using space technologies: saving time, quality, planning, decision-making, carrying out daily tasks ....
- **to understand** the adequacy between the institutional / governmental strategies and the technical capacities linked to the exploitation of satellite images and geo-information in general
- **to develop** a culture and capacities adapting to technological changes
- **to sustain** the use of space technologies within the institution

Objectives of Capacity Building at CRTS

- **Increase the national and regional potential users of space earth technology (OT)**

- **Inform and aware policy makers, project managers, youngs ... to the benefice of space technology**

- **Develop methods and techniques through research and development**

- **Share and disseminate information and knowledge on space technology**

TRAINING AT CRTS

General concepts of geo spatiale information

Processing techniques of geo information

Analysis methods

Design methods

Project management methodology

Applications :
Integrated Management of Watersheds
Natural risk management
Territorial development
Water resources
Urban planning
Agricultural sector
Management of coastal areas
……..

finality

Develop / strengthen technical capabilities for analyzing, designing and processing geo-spatial information that allow the efficient use of space technologies / needs

Progressive approach for learning

How to start a project using space technology

Prerequisites, methods, steps

How to produce useful, reliable, quality, cost - effective spatial information ... / objectives

Production techniques, characteristics, quality concepts, precision

How to design databases to meet objectives

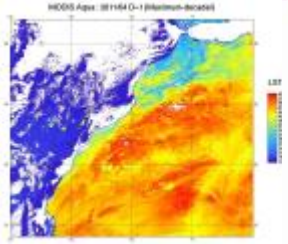
Design techniques, implementation of databases

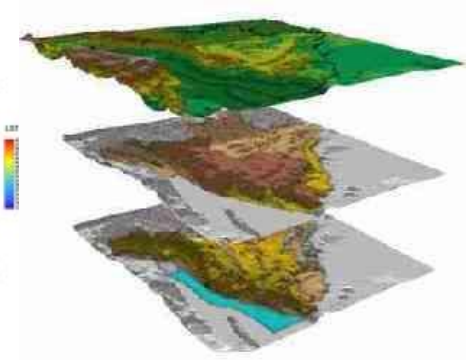
How to use technical tools to answer to queries

Technique for the exploitation of geo-spatial information: processing techniques, spatial analysis, modeling

A practical context for learning and analysis

- Experiential method of learning on concrete project
- 50% - 60% of the time for practical work





3 types of training

- **Calendar training**

  - Annuel calendar

  - thematics and et technical session training adapted to the national and regional priorities

  - Training courses adapted to the target

- **Training for specifics needs**

  - Analysis needs

  - Consultancy, design and implementation of training courses

- **Project training**

  – **User involvement throughout the project**

  – **Technology transfert**

Specialized and experienced trainers

The courses are animated:

- In large part by the **multidisciplinary team of the CRTS** which has developed a competence through the management and realization of projects with our national and foreign partners.

- by **national and international trainers**: academics and / or specialists for knowledge building and sharing of experiences.

TRAINING INFRASTRUCTURE

-A practical rooms eqeq uipped with teaching materials, 22 PC with TS and GIS software

- A computer room for students

- An auditorium with a capacity of 50 persons

- A multipurpose room / capacity 20 peoples

- A specialized librairy

AREAS OF TRAINING

Training on the tools, methods and techniques

-Remote sensing Technique
- Photo-Interpretation of satellite images
-Radar images
-Low resolution satellite Images

- GIS
- Spatial analysis
- Technical Production of geo infomation
- GPS-SIG
- Web Mapping
- Spatial Data Base design
- RS and GIS Project management
-….

Training on the applications of RS and GIS

-Town Planning
- Agriculture/ Forest
- Environment /Climate change
- Water resources
- Marine field /Coastline
- Space Oceanography
- Desertification
- Drought
- Network GIS
- Watershed Integrated management
- Space Cartography
- ….

A diversified target

The training courses are aimed at various profiles involved in the design and implementation of projects integrating space technology: decision-makers, project managers, technical executives and engineers, the academics ...:

- in the **ministerial departments**: environment, forest, water, plan, health, town planning, agriculture, fishing, education ...;
- in the **offices and agencies**: ORMVA, ONEP, ONE, ONCF, urban agencies, economic and social development agencies ...;
- in the **private sector**: consulting firms, topography cabinets ....
- In **the national institutions of the regional countries**

STATISTICS

TRAINING SESSION

- **Participant numbers : 2717**

1993 - 2002 (10 years) : 611
2003 - 2012 (10 years) : 1225 (approx. * 2)
- Quantitative evolution
- Qualitative evolution (more interest, needs better identified, participants more motivated)

- **Numbers of session : 193**

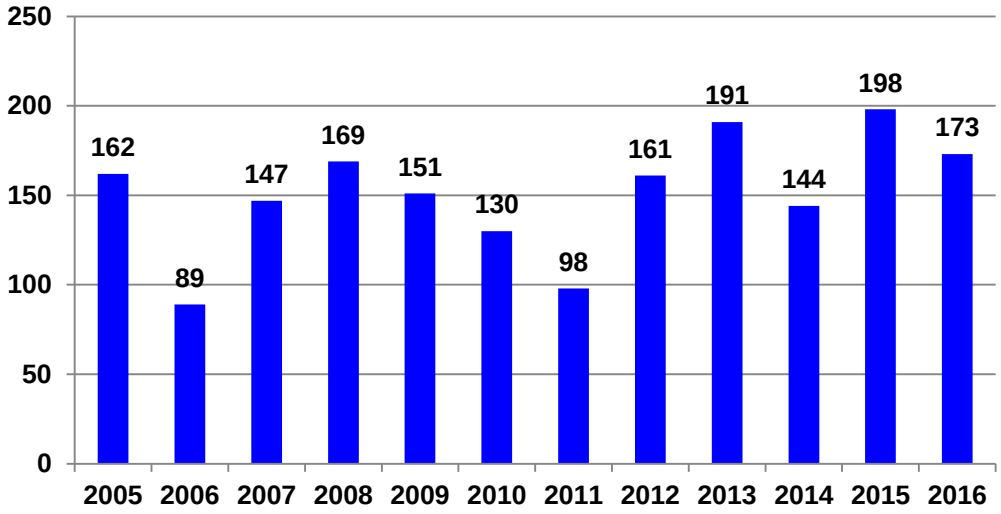
- 12 to 15 sessions/year

- Mean of 160 participants / years

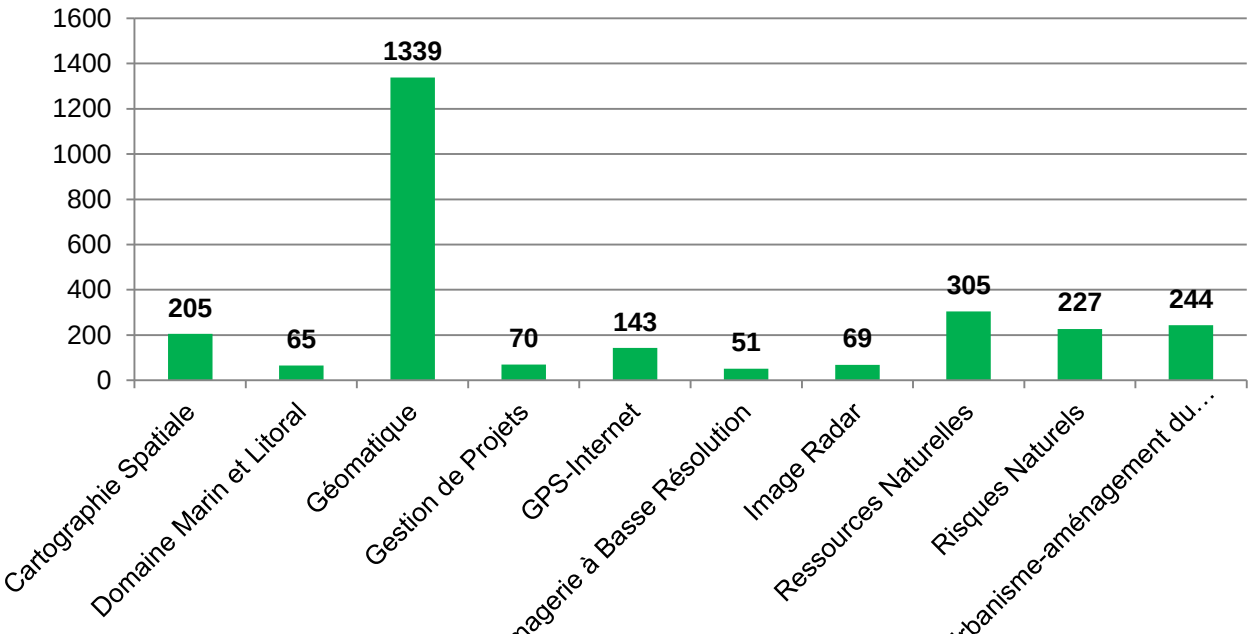
- Mean of 15 participants / session

STATISTICS

Participants evolution

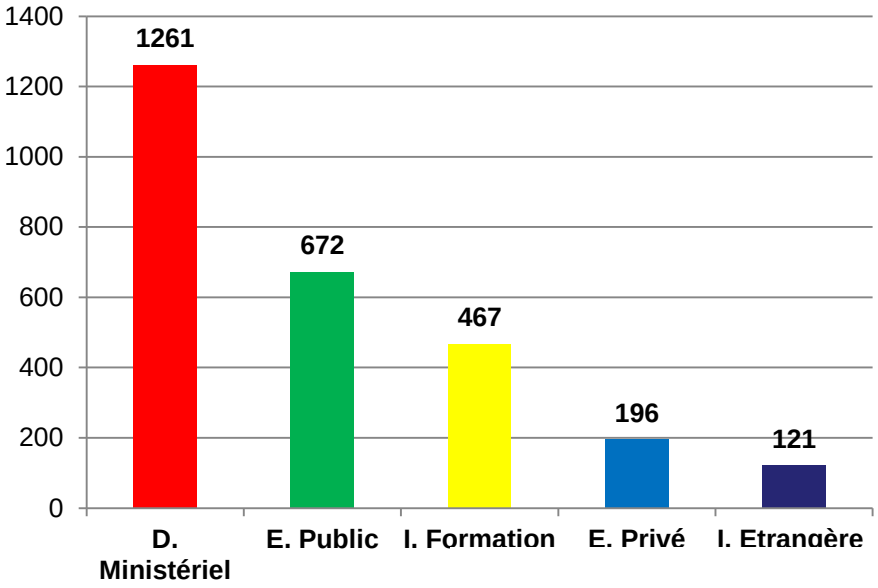


Participant / field

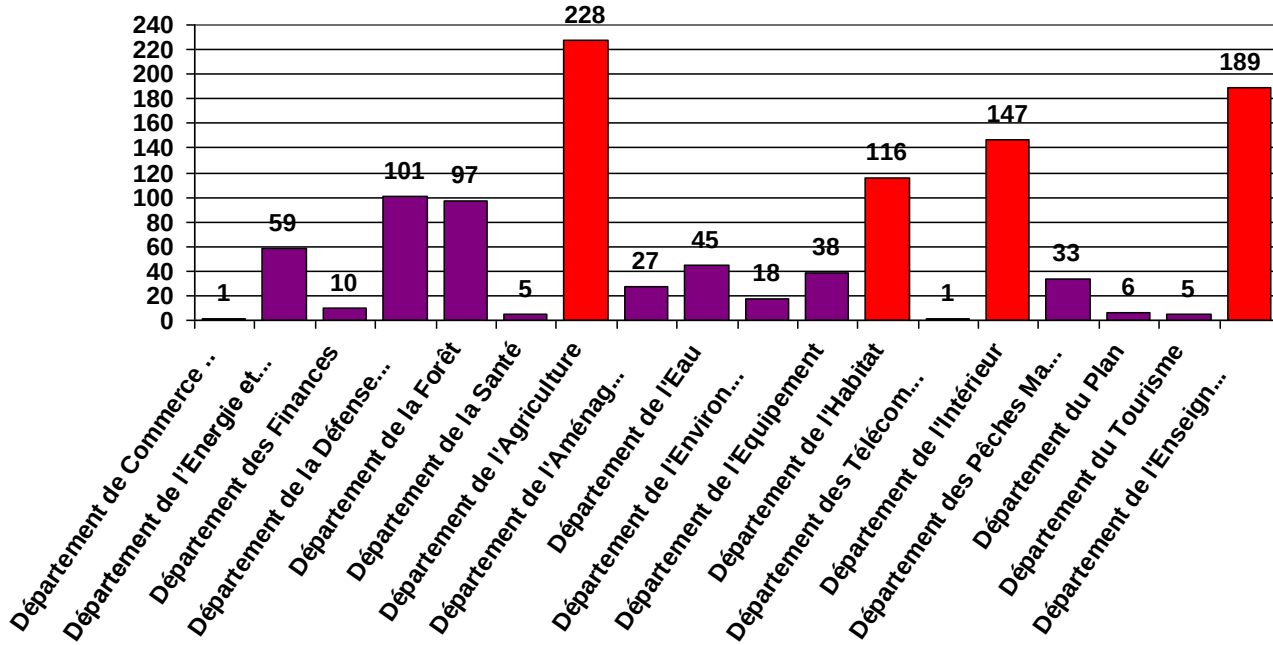


STATISTICS

Distribution Sectors / training



Ministerial departments



CB and International cooperation

- Organization of International Conferences for Africa and Middle East (UNOOSA, EURISY, ESA, CNES …)

- Organization of training workshops to national and regional level (UNESCO, FAO, UNDP, WB…)

- Organisation of training sessions in the framworks of joint projects (ex: RAMSES, CAMELEO, LIFE, SCHEMA, TIGER, LDAS…) with technical and financial support (PNUD, UE, FAO, ESA …)

- Providing of experts in training activities of the CRTS

CB and International cooperation Exemples (1)

- **APPLICATION OF RS ET GIS IN AGRICULTURAL FIELD**

  . Partner: OADA
  . Partcipants numbers : 20
  . 10 Africans countries

- **REGIONAL WORKSHOP FOR AFRICAN OCEANOGRAPHERS OCEAN REMOTE SENSING: A TOOL FOR OCEAN SCIENCE AN OPERATIONAL OCEANOGRAPHY**

  . Partner: COSPAR
  . Partcipants numbers : 25
  . 11 Africans countries

CB and International cooperation
Exemples (2)

USE OF METEOROLOGICAL SATELLITE DATA FOR MONITORING OF ENVIRONMENTAL IN MEDITERRANEAN REGION

- **Partner: UNESCO**
- **Participant numbers : 20**
- **100 applications for participation**
- **Moroccan researchers**

.....

Training on insurance and reinsurance of agricultural risks

Partner : SCR, Banque mondiale
Partcipants number : 20
8 african countries

Awareness - Information

- Information activities to sensitize policy makers, managers and young people toeconomic and social benefits of space :

  – Meetings, exhibitions, round tables to explain and demonstrate the role of space technology for economic and social development (institutions, universities, schools ...)

  – Editing a scientific and technical journal « **Geo Observateur** » lecturers comitee, No. 24 in progress

WHAT MAIN IMPACTS OF CB

- Greater integration of space technologies into the culture of the institution
- A better fit of the technology with the context of the institution
- Greater educated and / or trained community able to think and / or plan projects within their institution
- A mastery of the difficulties / advantages of using TS / needs

Lessons learned

- The needs today are more and more important and can be identified at the national and regional strategies and at the users level.
- The evolution of user needs and the progress of space technology requires to strengthen national and regional systems of monitoring and financial and technical support
- the Operational products from satellite imagery can be rapidely generalized and adapted to the national and regional levels but institutions requires financial support.
- The development of new EO services require significant R&D at the initial step before the operationalization phase.
- R & D programs that allow the development of new services adapted to the needs of users is limited access
- The lack of human skills in institutions is a limited factor to the development and management of EO projects in the institutions
- New EO programs are unknown by the users.

CONCLUSION

Our Future Approaches

- To perpetuate the existing training offer and improve, taking into account future developments in technology

- To respond to the demands of the institutions, more and more, in training and awareness-raising

- Strengthen training activities with the support of international and regional cooperation

- To showcase our know-how acquired through projects and training to other countries in the region

THANKS YOU
FOR YOUR ATTENTION

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