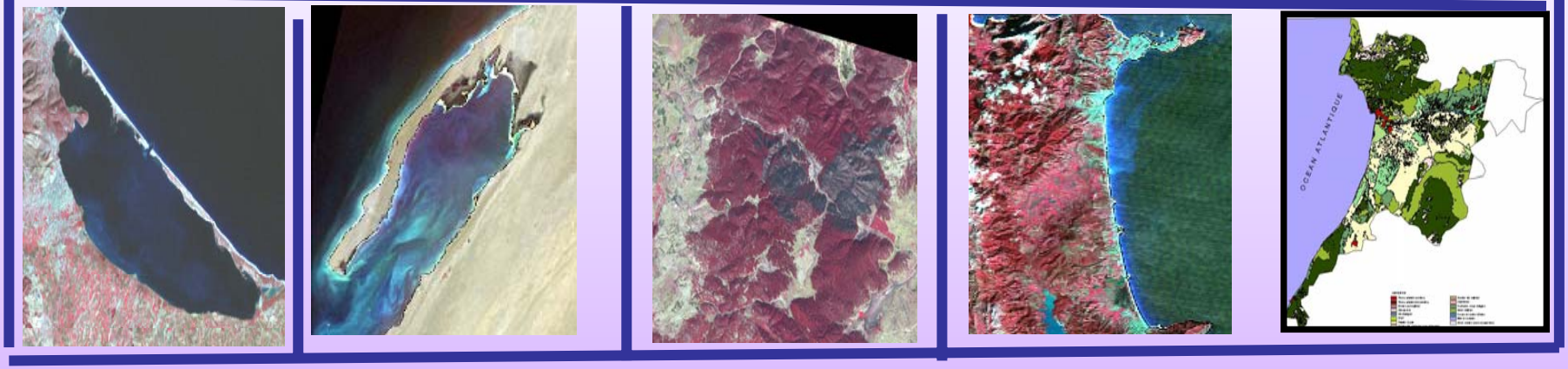
المركز الملكي للاستشعار البعدي الفضائي

CENTRE ROYAL DE TELEDETECTION SPATIALE

The Royal Center for Remote Sensing space education for a sustainable development



15th UN/IAF Workshop

« Space Education and Capacity Building for Sustainable Development

14-15 October 2005 Kitakiyushu, Japan

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Developing countries (Africa)

Space technologies requirements

Main needs for Developing countries in space technologies concerns :

- Capacity building to reinforce local human potential

- Access to earth observation data

- implication in international space technologies programs

- More sensitizing actions to the capabilities and benefits of the use of space technologies in sustainable development strategies

Difficulties of Space education in developing countries (Africa)

- Lack of space policy in the majority of countries

- Space industry is quasi inexistent to encourage the space training

- Insufficiency of the sensitizing actions towards decision makers to use space technologies in their sustainable development programs.

- Lack of operational activities to support training actions

-The Support for the Regional centers of remote sensing is still insufficient

- Lack of coordination between the centers and institutions of training: duplication of efforts

-Insufficient qualified human resources

- Student's grants are very limited

→ *The access to space education in developing countries is still limited*

Difficulties of Space education in developing countries (Africa)

- Significant potential of training institutions exists which requires :

- Coordination between the centers and institutions of training

- Setting up of long-term of adapted strategies of development of human resources in space technologies

- Developing of interdisciplinary trainings for the future decision makers and managers of the space activities

- Multiplication and adaptation of training programs taking into account regional context

- **Need of reinforcement of South-South cooperation :**

-Facilities of capacity building and transfer of knowledge from south country to another regarding to cultural, economical, social and geographical similarities

-Facilities of re-applicability of methods and techniques adapted to regional specificities

CRTS Remote Sensing Training and R&D experience

Main missions of CRTS :

1. **Promotion and integration of Space and Earth observation technologies to *meet needs of users and decision makers* involved Socio-economic and Development projects at the national level.**

   ✔ **Operational applications to support strategic decisions**

   - **To answer queries of the high authorities**
   - **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

Main missions of CRTS :

2. 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**

3. International actions to promote cooperation to ensure Technology transfer and cooperation development

- participation to regional and international programs (COPINE, AFRICOVER, RAMSES, LIFE, SMAP,…)

- membership in international associations and committees : COPUOS, COSPAR, ISPRS, IAF, SAF, EURISY,...

-organization of international conferences dedicated to the region

4. Provision of training and education opportunities in Space technologies and carrying out *R&D* actions and programs to *ensure sustainability and capacity building*

CRTS Remote Sensing Training and R&D experience

- **CRTS Provides training education opportunities in space technologies :**
  - **to enlarge users community of Space technologies**
  - **To reinforce the existing potentialities**
  - **To ensure decision makers, administrators, youth and general public awareness of the economic and social benefits of space activities**
  - **To integrate Space technologies in sustainable development approaches and methods**

CRTS Remote Sensing Training and R&D experience

To meet these objectives, CRTS :

- Sets up an adapted infrastructures dedicated to high technologies training

- Establishes an annual program and specific modules for initiation or performance enhancement

- Receives participants from the region and in cooperation with regional organizations (ESA, FAO, COSPAR,…)

- Contributes to train trainee-students from universities and engineering schools (PhD,…)

- Participates to Research activities in collaboration with Moroccan and African universities

-Participates to national universities and high schools programs: Providing specialized courses (RS and GIS)

CRTS Remote Sensing Training and R&D experience

CRTS Training centre : infrastructures dedicated to high technologies training

Adapted infrastructures (classrooms, hardware, software) dedicated to training in the field of space technologies (lectures, practical courses, image processing,..)

2 conference rooms (50 persons)

2 computer centers (30 PCs and all needed devices)

Specialized documentation centre

Annual program and specific modules for initiation or performance enhancement

-**Annual training program adapted to users requirements**

-**10 to 15 Training Sessions and modules to encourage the use of remote sensing and GIS techniques dedicated to senior executives and young students from different disciplines :**

- Sessions of 1 to 2 weeks

- Professional : urban mangers, geologists, oceanographers,…

-Decision makers

- Teachers and Students from universities and engineering schools

Annual program and specific modules for initiation or performance enhancement

Developing methods and space programs at various levels : **Various forms to answer various needs**

- **Basic knowledge sessions for Initiation to Remote Sensing and GIS techniques**

- **Sessions for the performance enhancement in the field of RS and GIS techniques and their applications**

- **Specific modules to answer specific users needs and requirements**

- **Training on specific projects**

- **Lectures and practical sessions**

- **Yield Visits**

Annual program and specific modules for initiation or performance enhancement

Each Training Session approaches the application of Remote Sensing in particular fields :

- Territorial management
- Urban Planning
- Agriculture and Forestry
- Land cover and land use changes
- Desertification,
- Water resources
- Natural Hazards management
- Coastal areas,
- Oceanography and marine resources,….

Annual program and specific modules for initiation and performance enhancement

MODULE	*name*	Topic	duration	period
1	*RS*	Initiation to remote sensing	5 days	31 January – 04 February 2005
2	*AT1*	Remote sensing : High and very high resolution for territorial and coastal areas management	5 days	28 February - 04 Marsh 2005
3	*AT2*	GIS for territorial and coastal areas management	5 days	04 – 08 April 2005
4	*RADAR*	Radar imagery : concepts and applications	3 days	04 – 06 May 2005
5	*BV*	RS and GIS for the integrated management of basins versants (environment, agriculture, water resources…)	5 days	23 – 27 May 2005
6	*ISBAR*	**Low resolution space imagery for vegetation monitoring** geology and , la geology et le water balance	3 days	15 – 17 June 2005
7	*COSPAR*	Space oceanography	10 days	19 – 30 September 2005
8	*GIS I*	Initiation to GIS	5 days	14 – 18 November 2005
9	*GPS -SIG*	Use GPS integrated to GIS	3 days	28 – 30 November 2005
10	*INTERNET - SIG*	Interactive mapping on the Web	2 days	05 – 06 December 2005
11	*GIS II*	GIS Improvement	5 days	19 – 23 December 2005

Training program for 2005

Specific training programs in cooperation with regional organizations

- **Developing training actions in collaboration with regional and international organization (French cooperation, space agencies (ESA, CNES) FAO,UNDP, COSPAR**,…) :

  - **To make available experts for CRTS training sessions**

  - **To Set up specific training sessions and workshops dedicated to sub-region : African participants**

-**Example :**

-**International Space Law Workshop (June 2006) in collaboration** with ESCL (European Centre of Space Law)

-Session of training and sensitizing of users on the fundamental principles and regulation of space activities

Example of Cooperation Action : COSPAR Workshop program of capacity building Workshops

- COSPAR Workshop on "the ocean remote sensing : a tool of ocean science and operational oceanography":

- From 19 to 30 October 2005 (CRTS, Morocco)

- Regional Workshop for African Oceanographers (26 participants from 11 countries) **:** PhD and Post-docs students, faculty lecturers from governmental institutions working in any area of ocean research

Objectives :

- Encouraging and developing the use of ocean remote sensing and associated *in situ* data by scientists in the African region
- Relating to existing research and potential applications in the region. : ocean currents, surface winds and waves, air-sea fluxes, marine biology, etc.
- enhancing the possibilities for trainees future works

Program based on lectures, Practical sessions and realization of mini-projects :

Continued actions :

-Trainee-groups defined regional projects to be conducted and realized by all participants in order to :

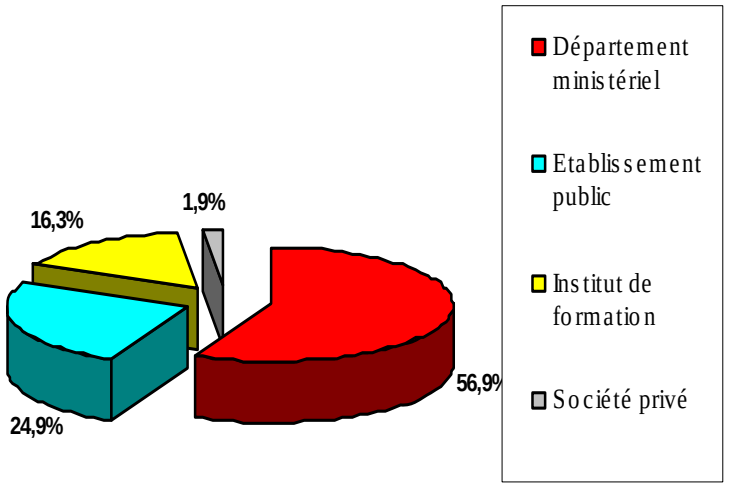
-facilitate African cooperation :

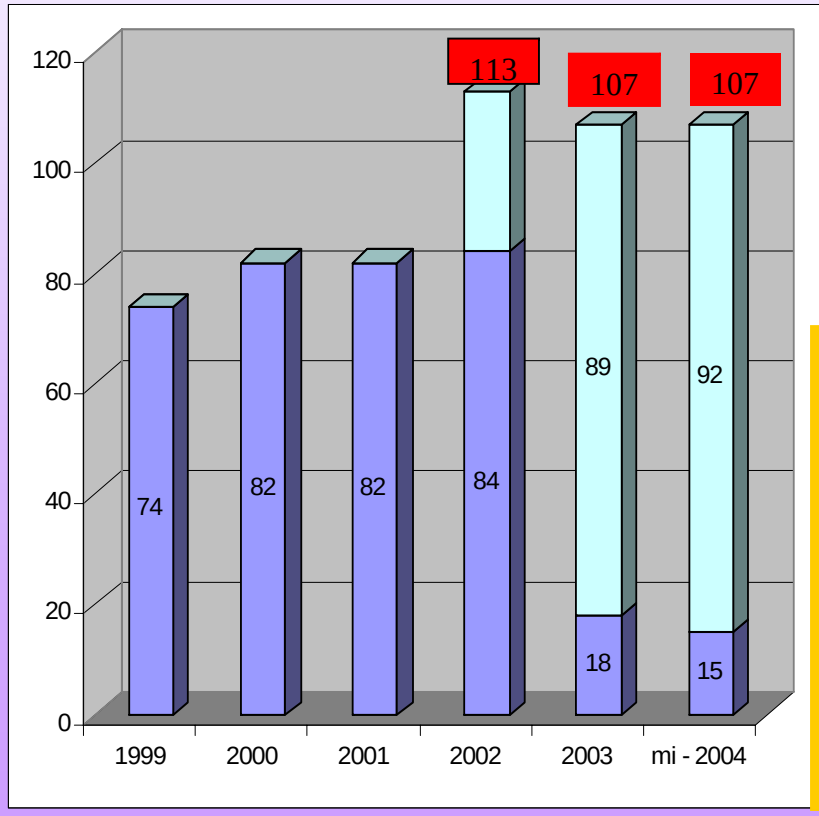
-participate more fully in the work of the international research community

set up an African network of oceanographers

CRTS Space training activities : an overview of training statistics from 1999 to 2004

813 participants (1993-2004)

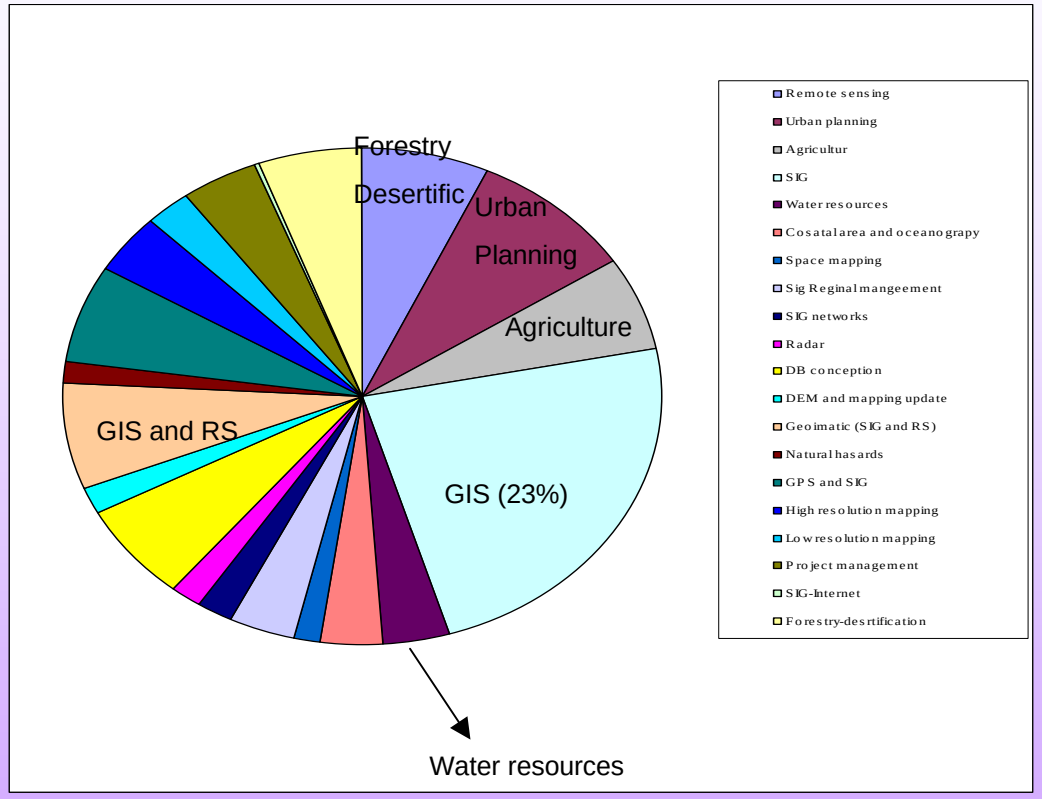




Increasing tendency of the participants in CRTS training programs

From 74 in 1999 to 107 participants in 2004

CRTS Space training activities :
an overview of training statistics from 1999 to 2004



Distribution of participants according to different sessions

CRTS R&D Actions

Developing Research and Development actions and programmes in collaboration with national and international universities and regional centres

- Reception of trainee-students from national and African universities and engineering schools

- Specific classrooms, hardware and software for students research works

- Co-training of PhD thesis

- Developing remote sensing methodologies and applications in various fields: Agriculture, urban planning, oceanography, desertification,…

Recommandations

Encouraging space technologies capacity building by:

- Facilitating and supporting the exchange of experts between the centers and specialized agencies of southern countries

- Contributing to training actions initiated by southern countries to meet their needs according to their priorities

- Supporting training actions in the framework of regional projects

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- Funding students and trainees from southern countries

- Setting up information change networks

- Improving and facilitating the access to the existing institutions in the region in the field of space technologies

- Institutionalization of training actions