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Athens, Greece



2nd South-Eastern Europe GEO Workshop
on Integrating Earth Observation Data
and Services for monitoring the
Environment, protecting the citizens and
stimulating the regional economic growth

ARCE Networking Activities and EO
Capacities in Algeria

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ARCE: Association for Research on Climate and Environment

ARCE is a non governmental organization. Founded in 1993 in Oran (Algeria) in a specific context: high level of environmental degradation, political instability, economical and societal problems .

Fundamental objective: " To promote multidisciplinary, co-operative and integrated research in climate science and environment applications " .

Strategy

- Research Projects
- Dialogue and Communication
- Links between Science and Decision
- Networking Actions

Fields of action

- Global change and Sustainable Development
- Climate Change and Impacts
- Drought and Desertification
- Pollution, Technological Risks and Impacts

Main actions of ARCE in Algeria - A -

Seminars/workshops

- *Environment: the main challenges (1994 Oran)*
- *Water resources: urgencies, realities, challenges (1995, Oran)*
- *Coastal environment (1996, Oran)*
- *Climate Change and Impacts (1997, Oran)*
- *Environment and Health (2000, Oran)*

Climate Change:

- Contribution to the first National Communication of Algeria

Sustainable development:

- National Action Plan on Environment and Sustainable Development (2002),
- National Strategy on Energy, National strategy on water resources
- Observatory of Climate Change and its Impacts on Development and Societies (*co-financed by UE, 2004*).
- *Scientific interdisciplinary workshops (ASIDs): Education to Eco-citizenship (Netherlands Embassy in Algeria)*

At the regional level

- B -

Global Change in the Mediterranean: concerted initiative **RICAMARE** (Research in Global Change in the Mediterranean) and **MEDCOM**

International Forum on Climate and Water Resources in the Maghreb (2001, Adrar)

NOSTRUM-DSS Project NOSTRUM-DSS Network On Governance, Science and Technology for Sustainable water Resource Management in The Mediterranean-The role of DSS Tool (FP6, 2004-2007)

Regional Project on Climate Change in Maghreb: thematic networks in the Maghreb (Climate and Water Resources, Climate and Pollution, Climate and Health)

Focal Point of the GEF-NGO Global network for the North Africa region (up to 2005)

TIGER Initiative (Use of Teledetection in monitoring the pollution in the west coast of Algeria, 2002)

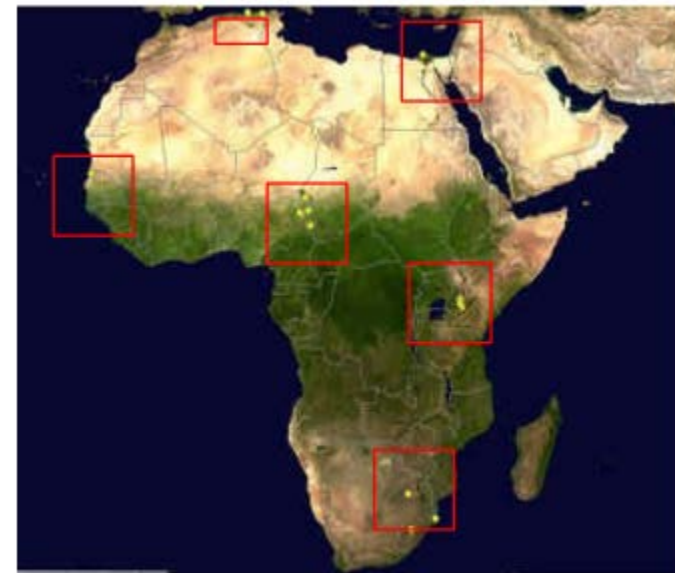
Climate Action Network (Focal point of CAN-Maghreb region) up to 2008

Examples of EO projects

TIGER Initiative (2002):

Recognizing the utility of satellite data for water resource management and the urgent need for action in **Africa** expressed at the World Summit for Sustainable Development (WSSD), the European Space Agency launched in **2002** the **TIGER initiative** aimed at **assisting African countries to *improve* the *deficiencies and lacks in the collection, analysis and dissemination of water related geo-information by exploiting the advantages of Earth Observation (EO) from space.***

ARCE: “Use of Teledetection in monitoring the pollution in the west coast of Algeria”



African GlobWetland Sites
Source: ESA

Euro-Mediterranean Societal Impact Project

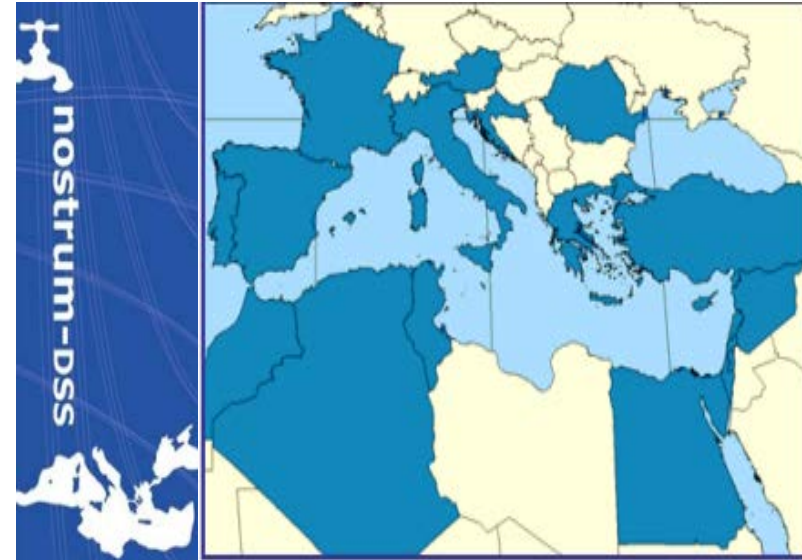
NOSTRUM-DSS Project (FP6, 2004-2007)

NOSTRUM-DSS Network On Governance, Science and Technology for Sustainable water Resource Management in The Mediterranean- The role of DSS Tool, a *Coordination Action*: (WP4 - GIS, Remote sensing, and Statistical Information in support of policy making)

Justification:

“The need and relevance for sustainable integrated water management strategies is clear. The great theoretical potential of Decision Support System (DSS) tools for helping **policy makers** to bring the principles of Integrated Water Resources Management (IWRM) into practice for **managing socio-political conflicts** over competing demands for water uses in different environmental situations seems to be not yet exploited”.

ARCE: “Enrichment of the DSS tool in Algeria”



Examples of EO projects

Climate Change and Impact Research: The Mediterranean Environment (CIRCE, 2008-2011, FP6) extended to 2012.

CIRCE produced data and knowledge to deal with climate impacts in the Mediterranean. The project enhanced the role of research as a tool to support actions and policies of adaptation to climate changes. The outcomes of the project are now available both for the scientific community and decision makers.

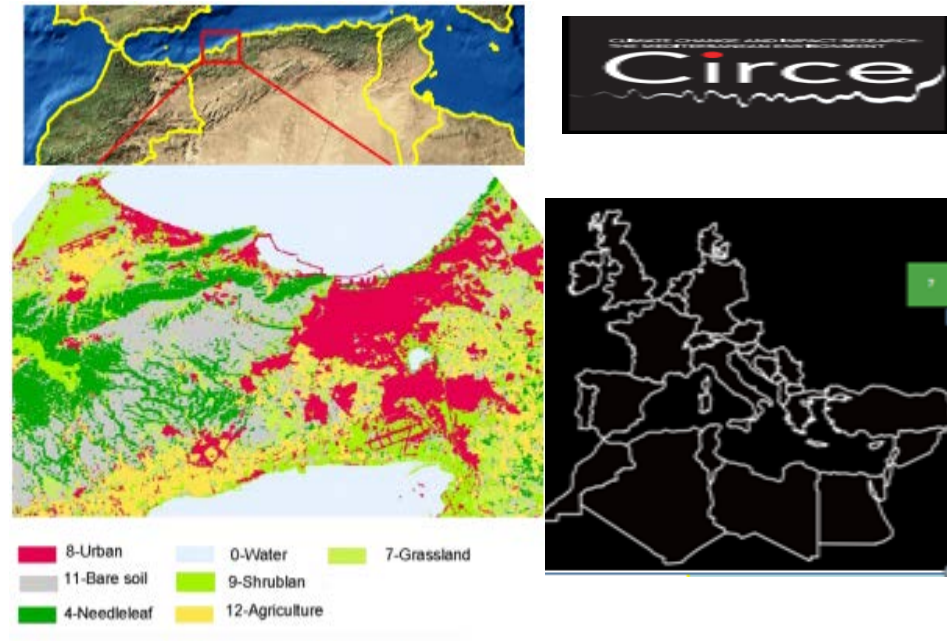


Figure 1: The Bay of Oran

ARCE : "Impact of Land Use on Local Climate and Carbon Uptake in the Bay of Oran"

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Examples of EO projects

CIRCE project: DISSEMINATION AND SUCCESSFUL NETWORKING ACTION

WHO ARE THE COASTAL ZONE ORAN CASE STUDY STAKEHOLDERS & HOW ARE THEY CONSULTED AND INTEGRATED? scientific community, local and regional collectivities, representatives of numerous government agencies, special interest groups and affected autochthon population.

DISSEMINATION & CONSULTATION: PRINCIPLES & SPECIFIC APPROACH: using a multi-media approach such flyers, display materials, interactive supports, fact sheets, “Frequently Asked Questions” document, project team presentations, scientific data bases, models, CIRCE project website and newsletters....

Workshop 1: Scientific partners

Workshop 2: Civil society

Workshop 3: Decision -Makers of Oran



Regional implication: Space Technologies

International Workshop : Climate Change and Adaptation in Africa: The role of the Space Technologies: Algiers : 22-24 October 2007

Main Recommendations:

- **Free and open access to data** for Earth observation and monitoring
- Climate **data exchanges** through regional and **continental cooperative** framework, involving experts and creation of common data
- Promoting **access** to the means of basic treatments and modeling **tools**

Algeria Involvement Continentally

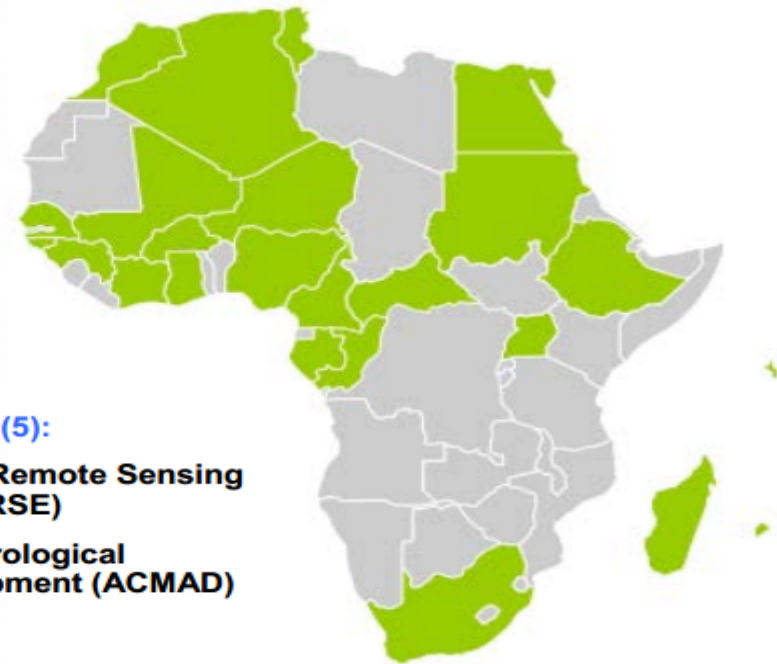


African Participation in GEO



Member States (24):

- Algeria
- Burkina Faso
- Cameroon
- Central African Republic
- Congo, Republic of the
- Cote d'Ivoire (Ivory Coast)
- Egypt
- Ethiopia
- Gabon
- Ghana
- Guinea-Bissau
- Guinea, Republic of
- Madagascar
- Mali
- Mauritius
- Morocco
- Niger
- Nigeria
- Seychelles
- Senegal
- South Africa
- Sudan
- Tunisia
- Uganda



Participating Organizations (5):

- African Association for Remote Sensing of the Environment (AARSE)
- African Center of Meteorological Applications for Development (ACMAD)
- EIS-Africa
- Regional Center for Mapping Resource for Development (RCMRD)
- United Nations Economic Commission for Africa (UNECA)



Algeria Involvement Continentally



AfriGEOSS Objectives

- ❑ Coordinate and bring together **relevant stakeholders**, institutions and agencies across Africa
- ❑ Provide **a platform** for countries to participate in GEO and to contribute to GEOSS;
- ❑ Assist in **knowledge sharing** and global collaborations;
- ❑ Identify challenges, gaps and **opportunities** for African contributions to GEO and GEOSS; and
- ❑ Leverage **existing capacities** and planned assets and **resources**.



AfriGEOSS was launched in Addis Ababa, Ethiopia, on 5 November 2013. The startup phase was led by a working group of African states and the GEO secretariat.

Political Framework & Support

- The World Meteorology Organisation (WMO) at its 66th Executive Council, Geneva, June 2014, recognised the value of AfriGEOSS and encouraged engagement with National Meteorological and Hydrological Services (NHMSs) to effectively meet government and societal needs. It further stated in its **WIGOS** document, *“The Council reiterated that collaboration and coordination with partners, including **AfriGEOSS**, the European Commission and many other non-WMO, non-NMHS communities, is a priority for WIGOS and will need additional attention in order to build synergy and avoid unnecessary duplication of effort.”*



Algeria Involvement Continentally

North Africa Involvement: During the THE 11TH EUMETSAT USER FORUM IN AFRICA (8-12 SEPTEMBER 2014, Benoni, South Africa : (1)

Recommendation # 19:

- The forum recommended the NMHS of Tunisia to pursue the discussion with EU towards the inclusion of some MESA-like activities in the framework of the Regional environmental program on water management.
- The forum recommended EU and AUC to take into account the activities formulated in the MESA-North Africa and Maghreb concept for the formulation of this first GMES & Africa project.

MESA : *Monitoring for Environment and Security in Africa*, proposed by the African Union Commission in Ouagadougou, 2010 aims to ensure continuity of past investments on the use of Earth Observation data in Africa.

Algeria Involvement Continentally

Presentation of regional actions : Algeria + South Africa + Ghana + Kenya:

- African cooperation: biannual « African Leadership Conference »
- African conference on the promotion and development of spatial activities in Africa
- African constellation project on natural resource management in Africa (ARMC)



The African Leadership Conference on Space Science and Technology for Sustainable Development (ALC)

The ALC is a cross-regional space organization that seeks to harness space science and technology for the betterment of the human condition in Africa, through active and regular engagements and interactions among African political leaders and its professionals and scientists, with the goal of building a vibrant Africa partnership in space science and technology. The above focus and goal of the ALC have shaped its programs since its inception in 2005 till today.

1. The ALC Congresses:

The ALC Congresses focus on giving the African member states the opportunity to share their space aspirations, knowledge, experience and the lessons learned in their day-to-day space-related activities and foster cooperation and collaboration among them. The African Resources and environmental Management satellite Constellation (ARMC) is an example of such collaboration.

2. Target audiences:

- National leadership of African countries.
- Collective leadership of the African Union (AU) New Partnership for Africa's Development (NEPAD).
- African space community.

3. Presentations and contributions at ALC Congresses

Plenary and Parallel Sessions: The plenary sessions of the ALC Congresses are devoted to accomplishing the goals of the ALC. Thus, contributions are made by African member States and by the United Nations, through UN-OOSA. The ALC was conceived on UN-OOSA's platform in Vienna in 2004 and it has supported the ALC ever since. Its activities at ALC Congresses are conducted at parallel sessions and they focus on building indigenous capacity and capability in space science technology (SST) in Africa.

4. Previous ALC conferences:

- 1st ALC: Abuja, Nigeria, 23-25 November 2011
- 2nd ALC: Cape town, South Africa, 2-4 October 2007
- 3rd ALC: Algiers, Algeria, 7-9 December 2009
- 4th ALC: Mombasa, Kenya, 26-28 September 2011
- 5th ALC : Accra, Ghana, 3-5 December 2013.



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During the THE 11TH EUMETSAT USER FORUM IN AFRICA 8 SEPTEMBER - 12 SEPTEMBER 2014, Benoni, South Africa : (2)

Recommendation #33: Data from EO initiatives in Africa

- To promote, through these initiatives and projects, an open and free access to all relevant EO datasets;
- To coordinate data access and sharing at continental level, including harmonization of data format and protocol for data exchange, as well as exploring technical means for access and sharing;
- To focus capacity building effort on datasets available openly and freely to Africa;
- To coordinate their efforts in order to come-up with a unique African EO portal, which would, at least, catalogue all EO data available from and to Africa, planning also interoperability with other existing EO portal available across the globe.

Algeria Involvement Globally : COPUOS

Committee on the Peaceful Uses of Outer Space: 2014 (COPUOS), Fifty-seventh session (11-20 June 2014) held in Vienna and Chaired by Algeria

Mr. Oussedik Azzedine, General Director of the Algerian Space Agency was elected on behalf Algeria, as a chairman of COPUOS for the biennial 2014-2015.

Now: 76 members

Algeria: Joined COPUOS in 2002



Algerian Experience: Algerian Space Agency (ASAL)

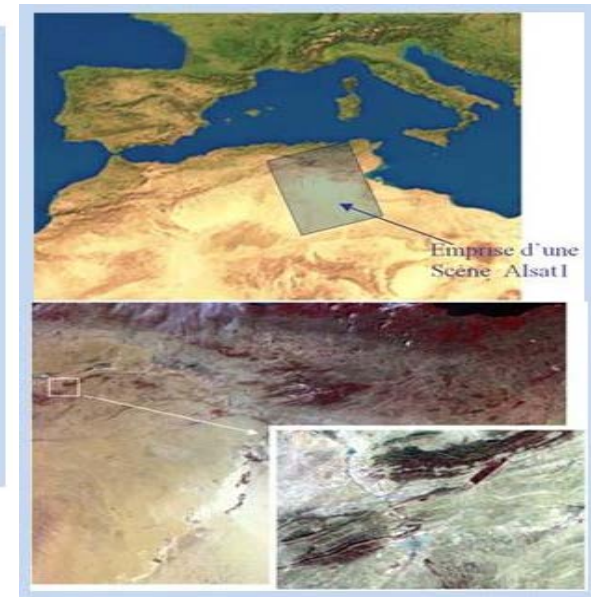
28 November 2002:
Launching of Alsat-1

Launched within DMC (Disaster Monitoring Constellation) programme for the period 2002-2005.

The objective of the mission is to provide multispectral images of average resolution for the monitoring of the natural disasters and other remote sensing applications fields



Le micro satellite Alsat 1



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Algerian Experience: Algerian Space Agency (ASAL)

The Algerian high resolution earth observation satellite ALSAT-2



Integration and test in Algeria of the new high resolution earth observation satellite ALSAT-28



ASAL has integrated in the Horizon 2020 program, the Technological aspects

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12 July 2012: Launching of Alsat-2A:

Earth Observation Satellite with high resolution, with a space resolution of 2.5 m in panchromatic mode, and of 10 m in multi spectral mode (Up to 30.000 images products)

Imagerie Alsat-2A pour la gestion du plan parcellaire de la commune de Sidi Chami (Wilaya d'Oran)

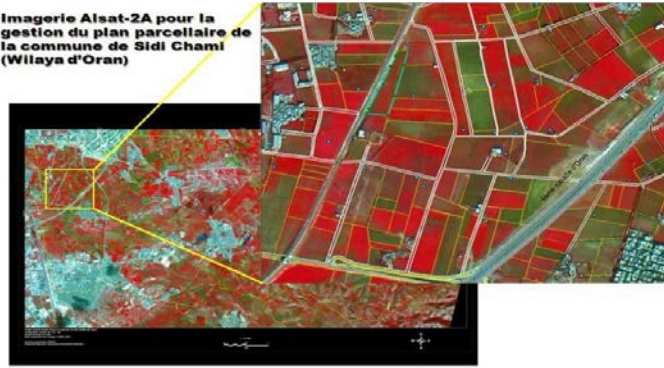


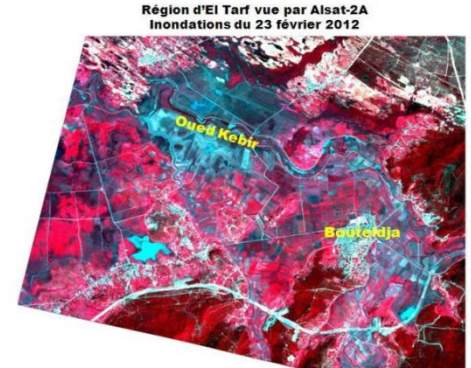
Image Alsat-2A du 02/04/2011
Mode : PAN - Sharpening
Résolution: 2,5 m



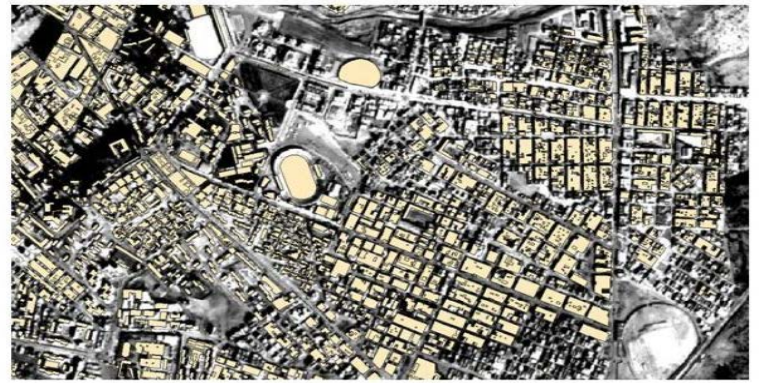
Contribution de l'imagerie Alsat-2A dans l'étude de la pollution marine causée par Oued Soummam, Ville de Béjaia.



Région d'El Tarf vue par Alsat-2A
Inondations du 23 février 2012



Intégration de l'imagerie Alsat-2A



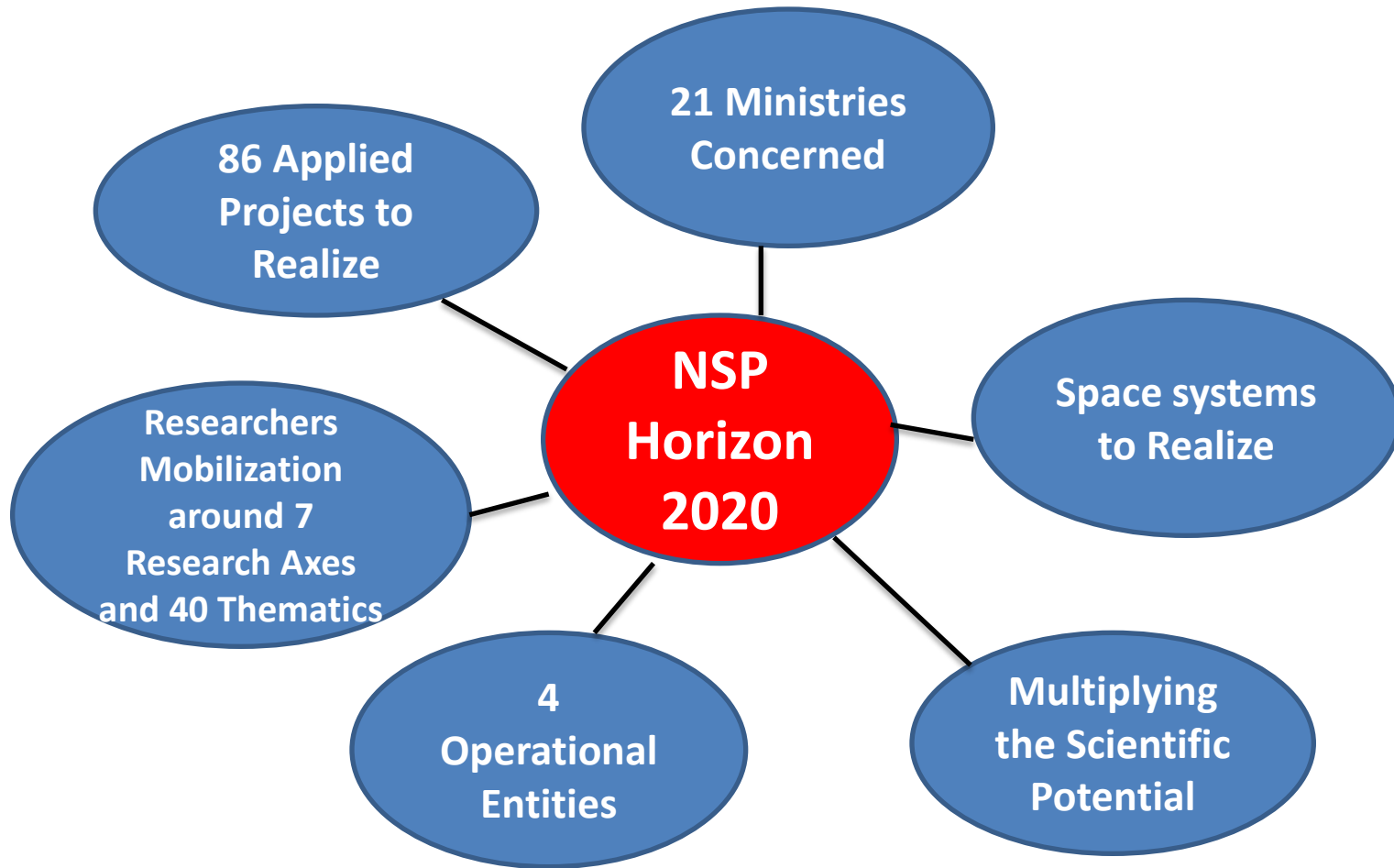
Superposition d'un extrait du plan cadastral et l'orthoimage

Algerian Experience: Algerian Space Agency (ASAL) Domains of application

- Management of Natural disasters: floods; forest fires, desertification,...
- Management of Natural resources: Study of the Hydrographic network; agriculture (North or Saharan); Soil occupation and urban extension
- Management of infrastructures and equipment; Watersheds, highways, urbanization....
- Major risks

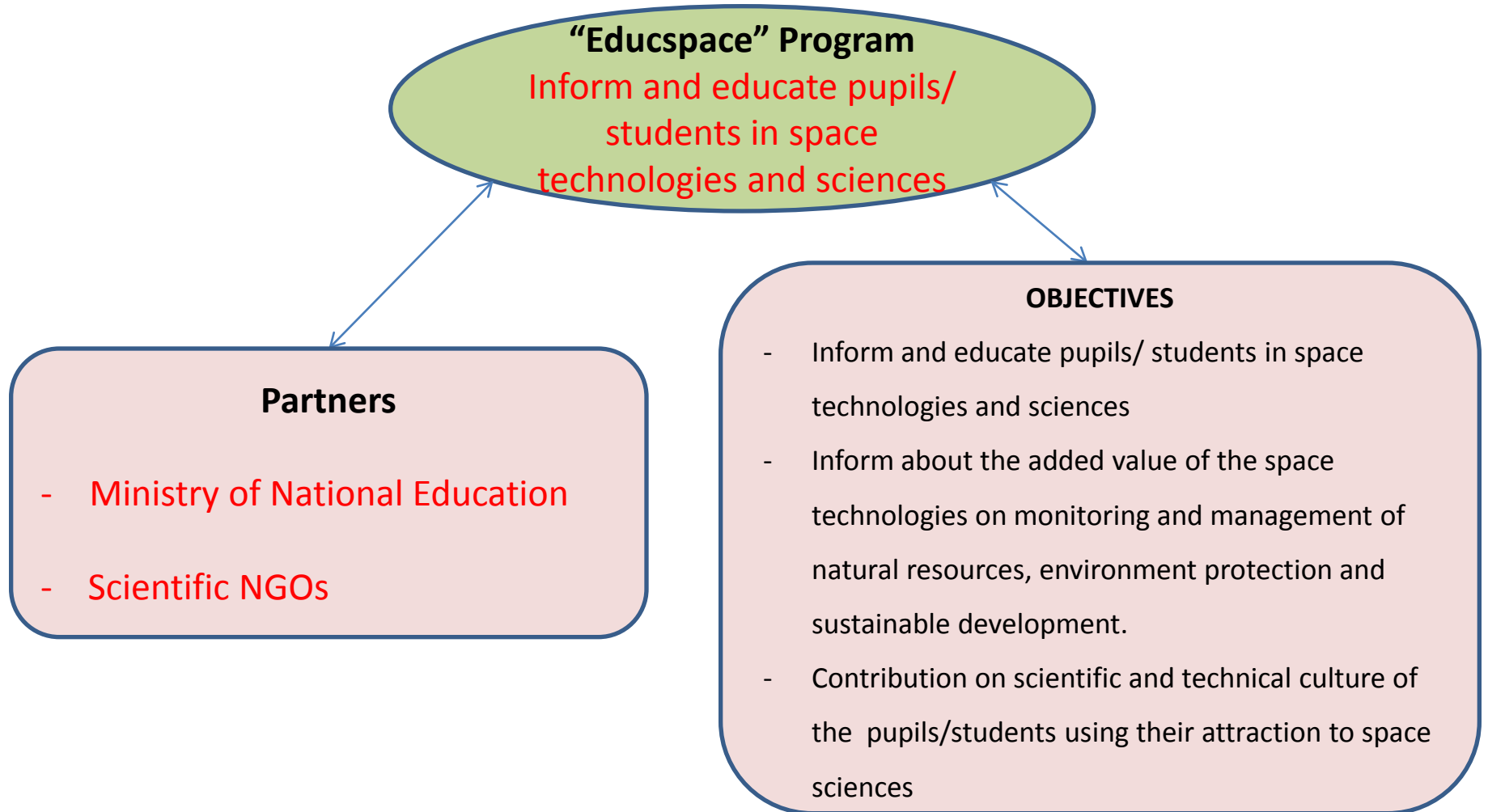
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ASAL : National Space Programme (NSP), Horizon 2020



ARCE Networking Activities and EO Capacities in Algeria

Algerian Experience: Algerian Space Agency (ASAL) Dissemination action locally : EDUCSPACE Program



Earth Observation for Economic Empowerment (EOPOWER)

Based on the experience in the GEONetCab project

1. SWP-1.2 - Inventory of the Current situation in AFSC

WP1 allowed to draw a brief map of the EO in the AFSC, classifying AFSC according to their level of use of the EO and the information available in these countries. At this stage, the 22 AFSC were classified according to the abundance of information and the degree of use of the tools of the EO:

Group 1 Algeria, Morocco and Tunisia

➔ countries where EO is relatively well structured

Group 2 Cameroon, Ivory Coast, Madagascar, Niger and Senegal

➔ countries having management structures and research in the domain of Earth Observation to varying degrees by country

Group 3 Benin, Burkina Faso, Congo, Gabon, Mali, Mauritania, Togo and DR Congo

➔ countries where the EO is always to the initial state

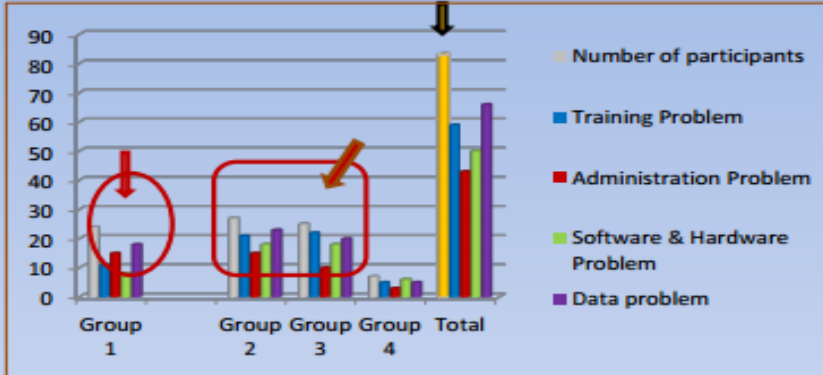
Group 4 Burundi, Cape Verde, Central African, Guinea, Chad and Rwanda

➔ countries that have very little information on the EO.

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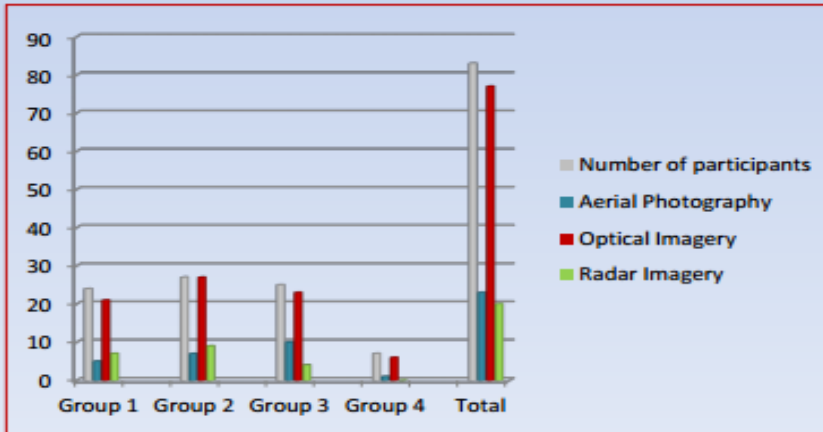
Based on the experience in the GEONetCab project

Problems that hinder the development of EO



- In general the problems hindering the development of EO in the AFSC are in descending order The lack of: **1 Data > 2 specialized training in EO > 3 computer soft ware and hardware > 4 Administration Problem.**
- For countries of group 1, the administration problem seems important; it is almost the same level as the problem of access to data.
- The main problem for groups 1 and 2 is the lack of data, software & hardware problem and training

Type of data using



- The spatial data is a big bottleneck to the development of EO in Africa. Access to the data at low cost is still very difficult.
- However, and in relation to the initial situation:
 - ✓ the use of optical images has taken over from aerial photographs;
 - ✓ the use of radar images began, but it's still very low, despite the advantage its use in tropical and equatorial countries.

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Source: Anas Emran presentation, IASON Project, CRATSE-LF, 2014

Thank You