

# THE AFRICAN OUTER SPACE PROGRAM



## Lessons learnt in Building a Space Ecosystem

*Meshack Kinyua*  
*Space Applications Training Officer*



# Space and Agenda 2063

THE **7** Agenda **2063** ASPIRATIONS



# THE AFRICAN OUTER SPACE PROGRAM

*A Flagship Programme of agenda 2063 for an integrated, prosperous and peaceful Africa, driven by its own citizens and representing a dynamic force in the global arena*



**TOWARDS  
AN OPERATIONAL  
AFRICA SPACE  
PROGRAMME**



Earth  
Observation



Satellite  
Communication



Navigation  
and Positioning



Astronomy and  
Space Science

# AFRICAN SPACE POLICY AND STRATEGY GOALS

A satellite with solar panels is shown in orbit above the Earth. The African continent is clearly visible on the left side of the globe. The background is a dark space with some faint green lines representing orbital paths.

## Policy Goals

- Well-coordinated and integrated African space Programme that is responsive to the social, economic, political and environmental needs of the continent, as well as being globally competitive.
- Regulatory framework that supports an African space Programme and ensures that Africa is a responsible and peaceful user of outer space.

## Strategy Goals

- Space-derived products and services used for decision-making and addressing the economic, political, social and environmental challenges.
- An indigenous space capability, both in the private and public sectors, that defines a coordinated, effective and innovative African-led space Programme

## Space policy objectives

Addressing user needs

Accessing space services

Developing the regional market/industry

Adopting good governance and management

Coordinating the African space arena

Promoting international cooperation

## Strategic actions

Leveraging space-derived benefits

Strengthening Research, Development and Innovation

Developing and utilizing human capital

Institutionalizing a corporate governance structure

Adhering to regulatory requirements

Building critical infrastructure

Fostering Regional Coordination and Collaboration

Promoting strategic partnerships

Funding and Sustainability

# Governance

**Adoption of African  
Space Policy and  
Strategy-2016**



**Call for M.S. to express  
intentions of hosting  
AfSA and 1<sup>st</sup> Annual  
Space Dialogue-2017**



**Adoption of Statute for  
the African Space  
Agency and 2<sup>nd</sup> Annual  
Space Dialogue-2018**



**High-Level Panel assess  
candidate countries to  
host AfSA-2018**



**Operationalization of  
AfSA-2024-2025**



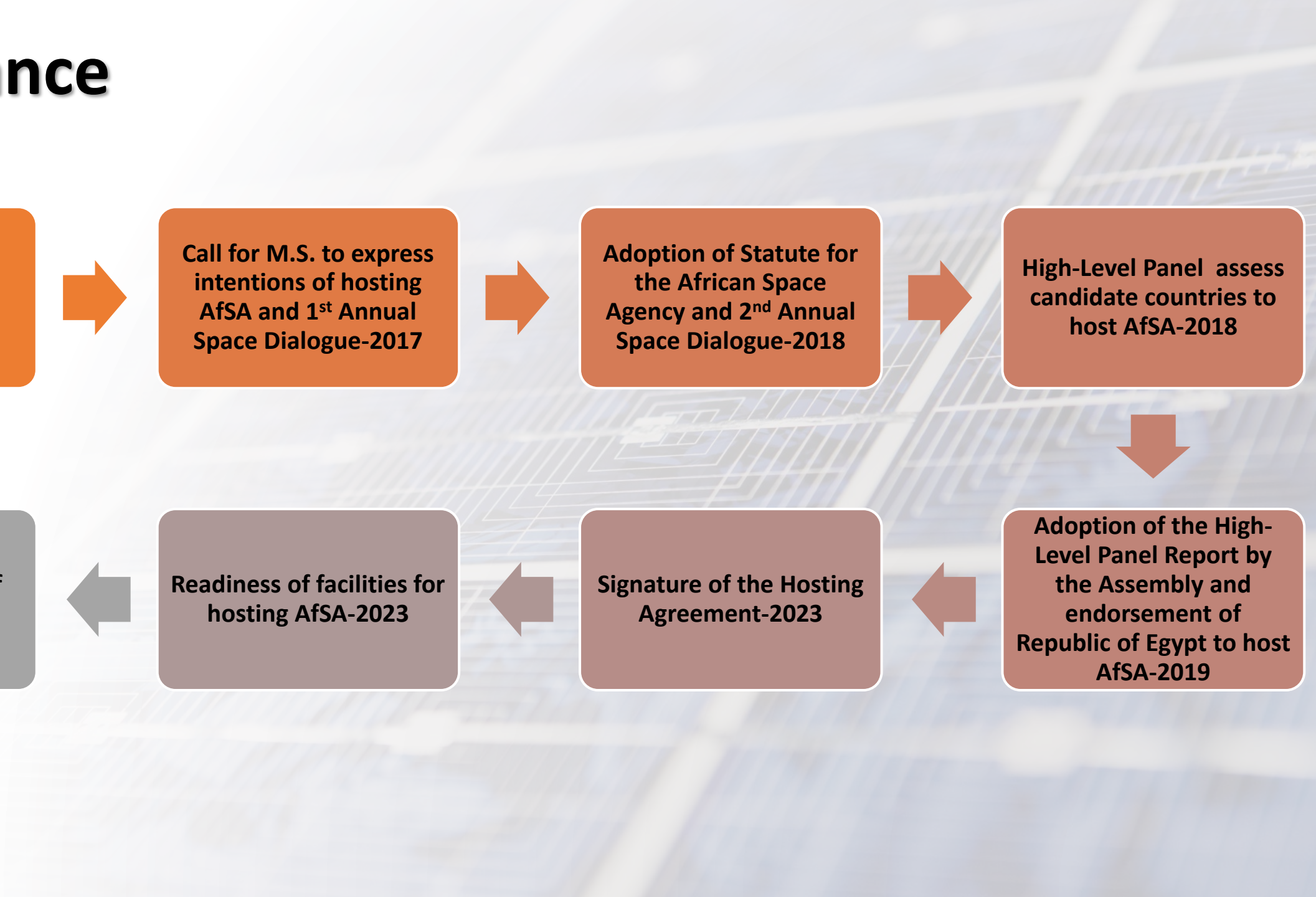
**Readiness of facilities for  
hosting AfSA-2023**



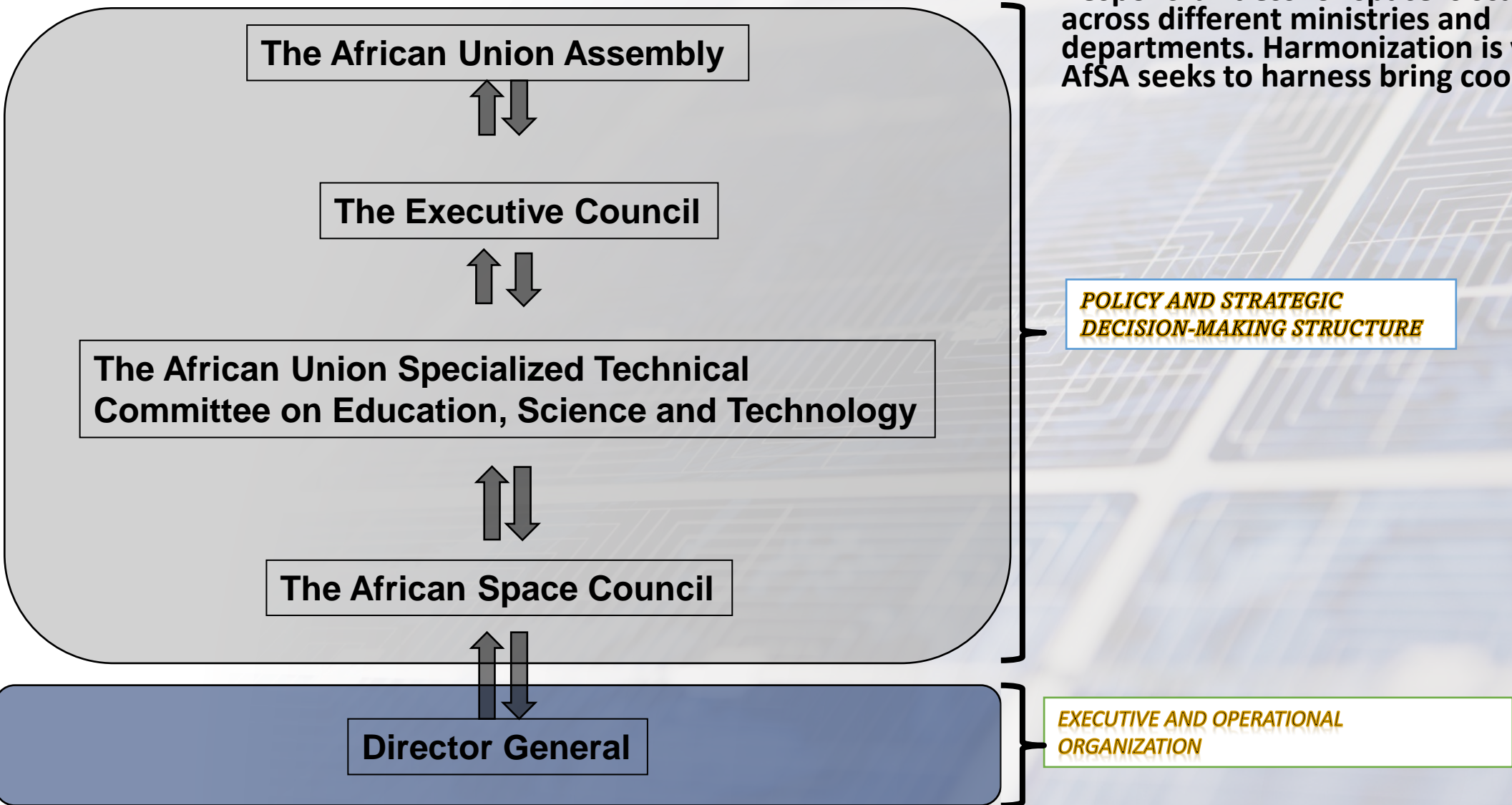
**Signature of the Hosting  
Agreement-2023**



**Adoption of the High-  
Level Panel Report by  
the Assembly and  
endorsement of  
Republic of Egypt to host  
AfSA-2019**



# Governance

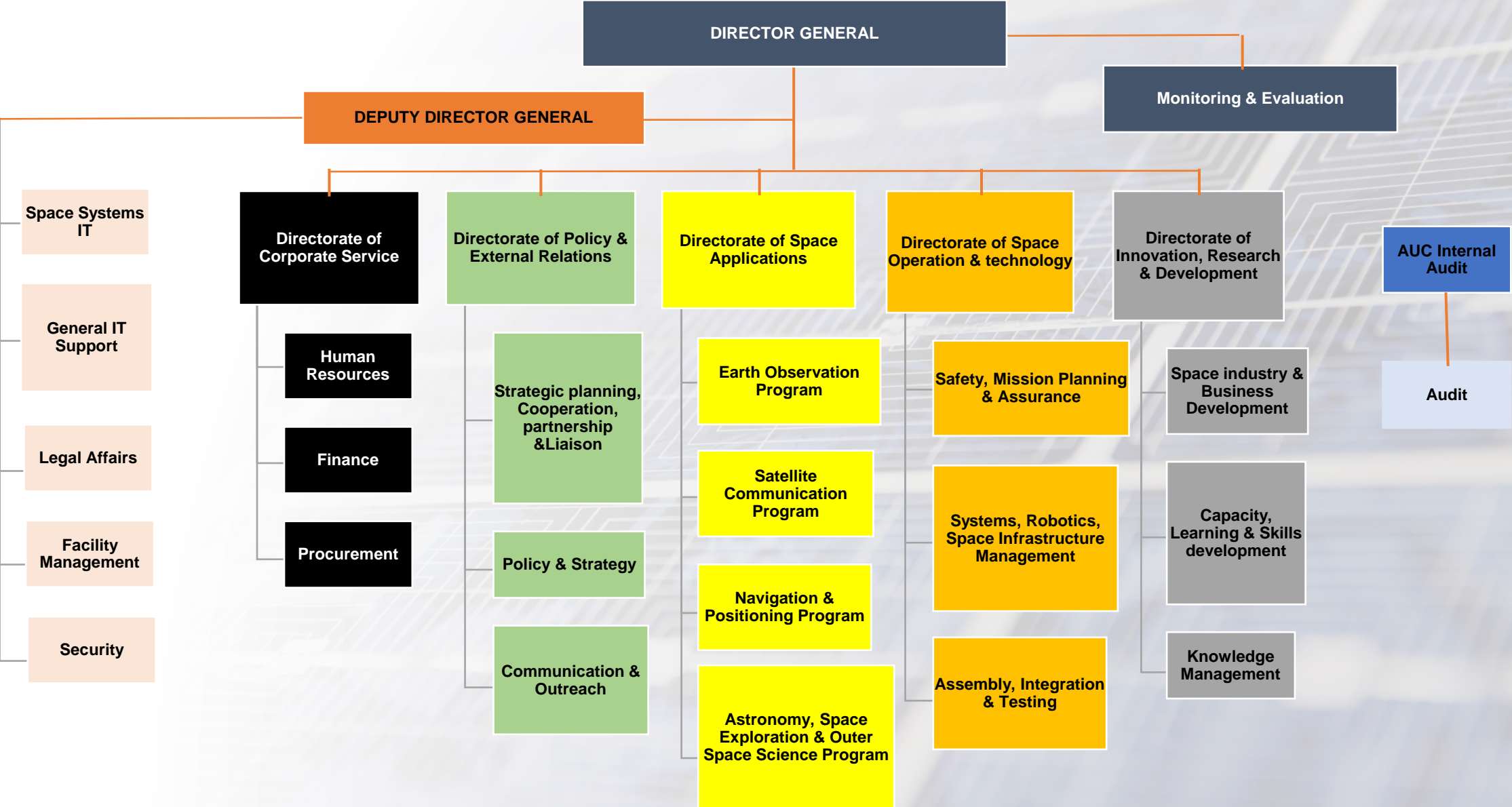


Responsibilities for space is scattered across different ministries and departments. Harmonization is very key. AfSA seeks to harness bring coordination

*POLICY AND STRATEGIC  
DECISION-MAKING STRUCTURE*

*EXECUTIVE AND OPERATIONAL  
ORGANIZATION*

# Governance





# Programmatic achievements

**Survey on Earth Observation  
private sector in Africa**

**Implementation of GMES &  
Africa**

**AUC-EC agreement on  
Copernicus Data access**

**Survey and Gap Analysis on  
Navigation and Positioning in  
Africa**

**Baseline Study on Socio-  
Economic Benefits of Space  
in Africa**

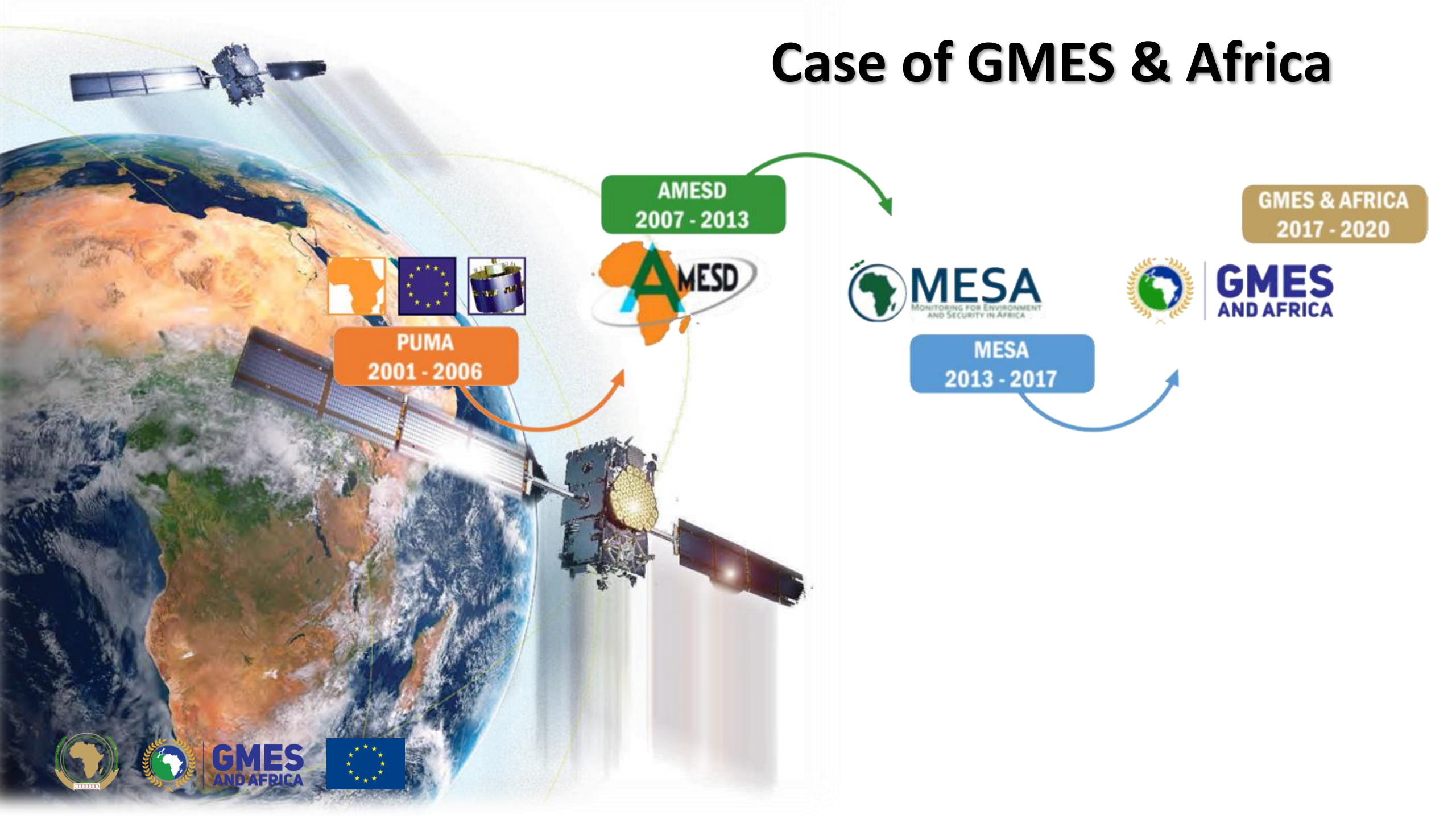
**Baseline Study on Astronomy  
and Space science**

**Baseline Study on Satellite  
Communication**

**Survey on Earth Observation  
Academia**

**Africa Space Agency  
operationalization**

# Case of GMES & Africa



**GMES  
AND AFRICA**



# CONSORTIA ECOSYSTEM

## NORTHERN AFRICA

- OSS-Tunisia
- NARSS-Egypt

## WESTERN AFRICA

- CSE-Senegal
- UoG-Ghana
- CSSTE-Nigeria

## CENTRAL AFRICA

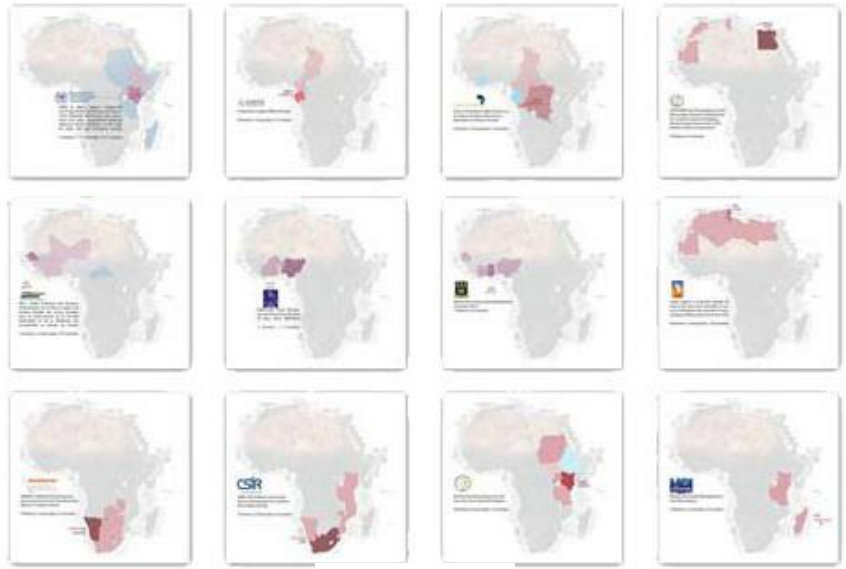
- AGEOS-Gabon
- CICOS-Democratic Rep. Of Congo

## SOUTHERN AFRICA

- CSIR-South Africa
- SADC-Botswana
- SASSCAL Namibia

## EASTERN AFRICA & SOUTH WEST OF INDIAN OCEAN

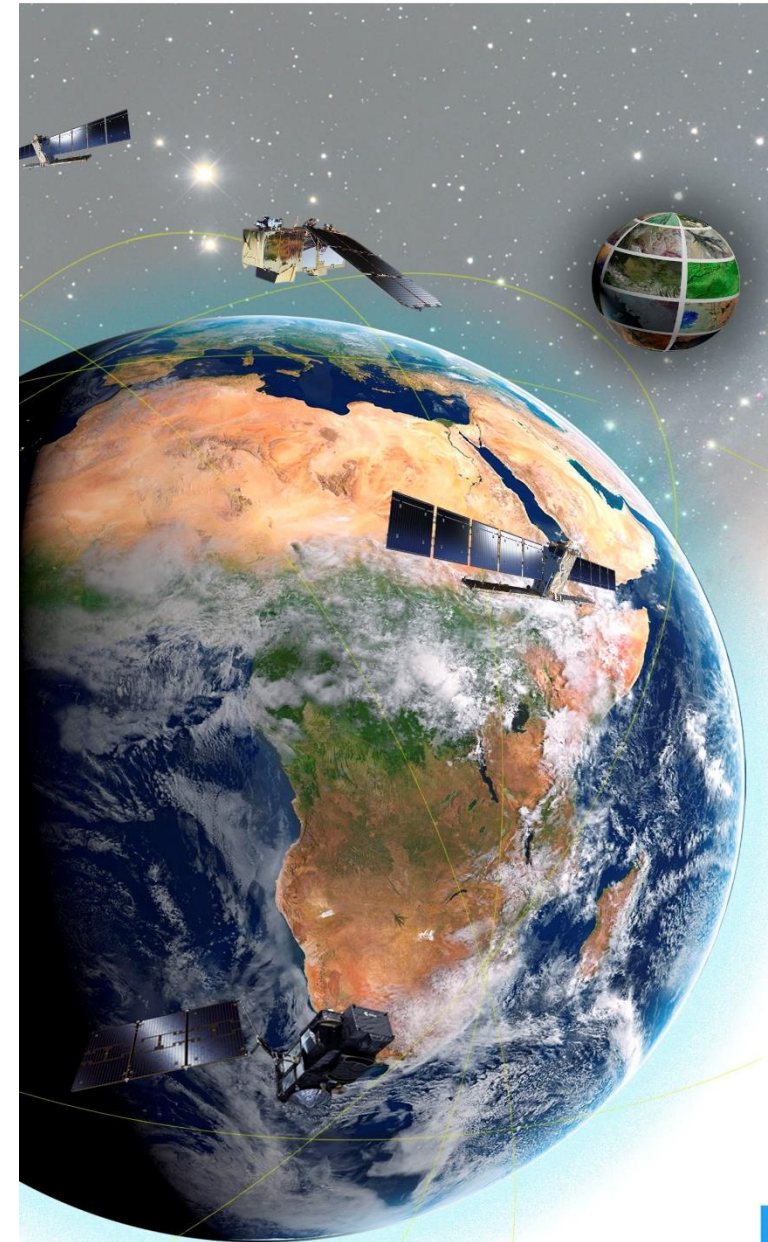
- ICPCAC-Kenya
- MOI-Mauritius
- RCMRD-Kenya



# Marine and Coastal Applications



**GMES**  
AND AFRICA



## Monitoring and Forecasting of Oceanography Variables

Monitoring and Forecasting of physical and biological oceanography variables

Fishing Zones Monitoring and Protection

Aquaculture Site Monitoring and Protection



## Coastal Area Monitoring

Coastal Vulnerability

Coastal Ecosystems Mapping, Monitoring and Assessment



## Ship Traffic and Pollution monitoring

Ship Traffic Monitoring

Oil Spills Monitoring and Warning



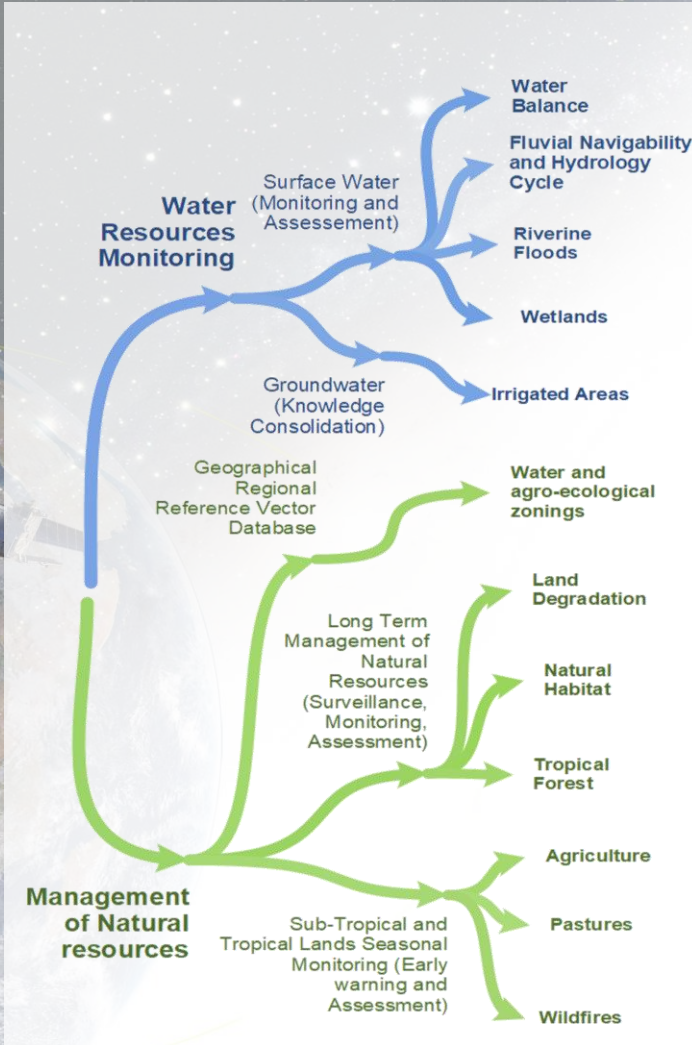
## Marine Weather Forecast

Regional Marine Weather Forecast

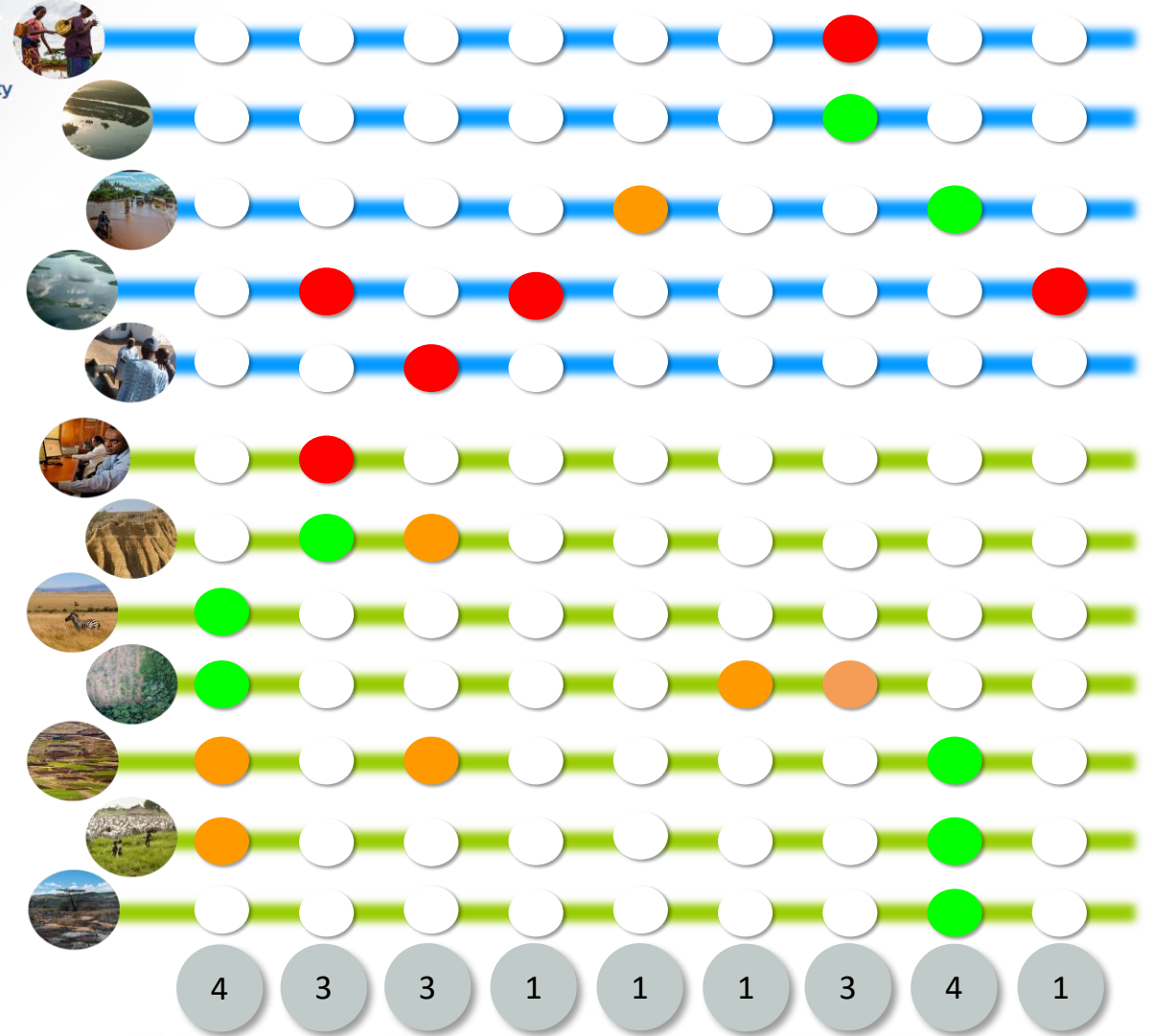
3 days Marine Weather Forecast



# Water & Natural Resource Applications

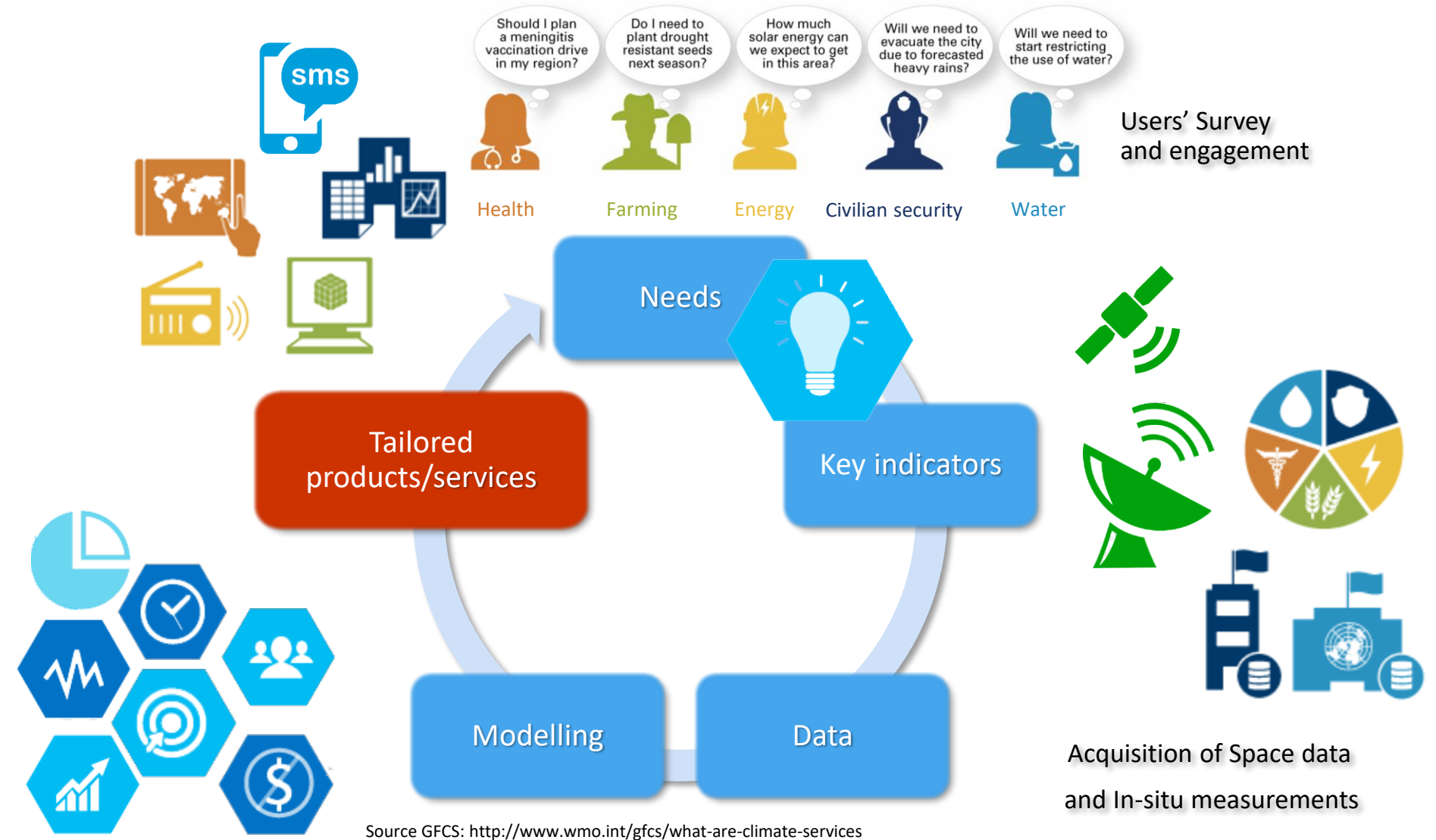


Eastern Northern Western Central Southern  
 ICPAC RCMRD OSS CSE CSSTE AGEOS CICOS SADC SASSCAL



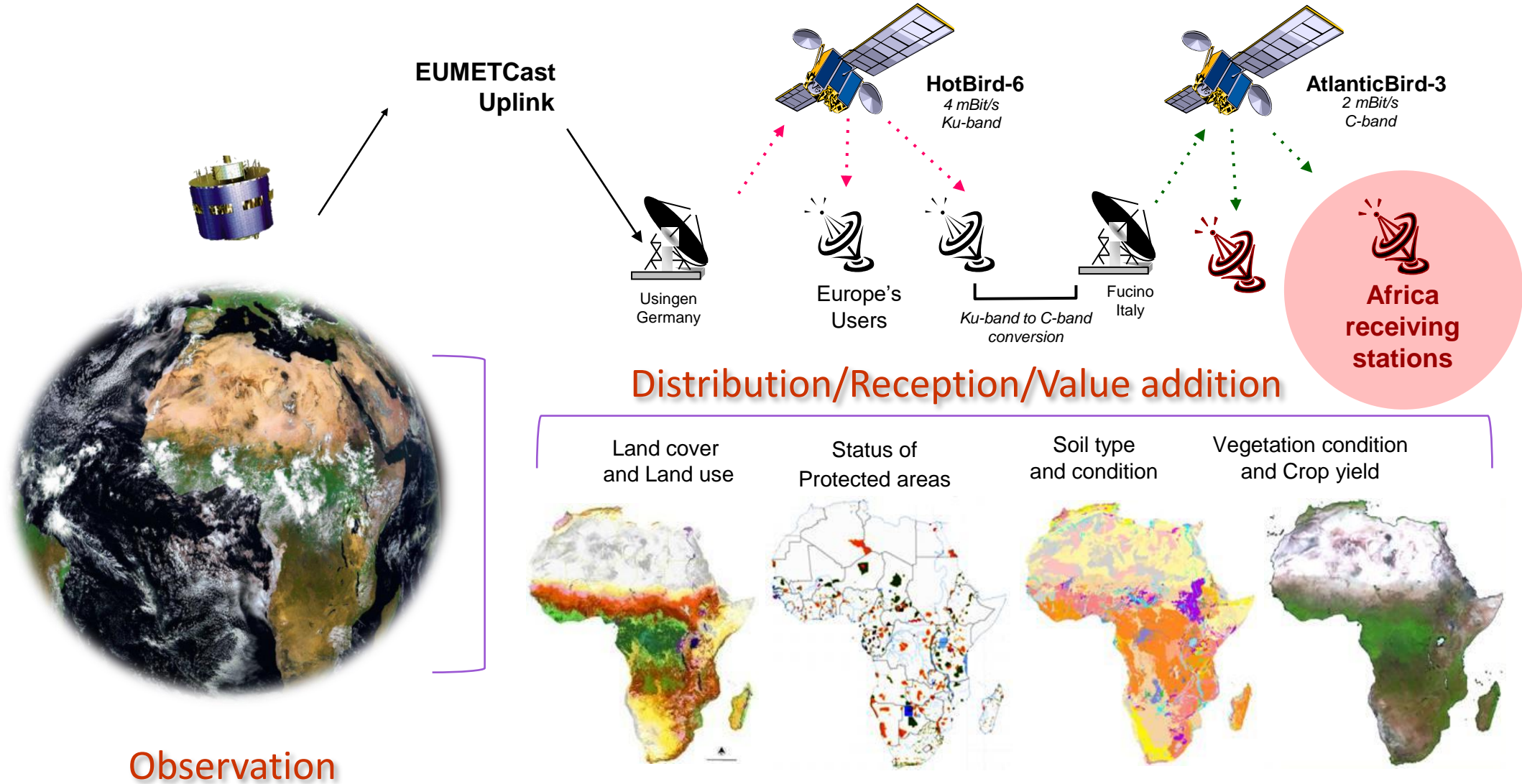
4 3 3 1 1 1 3 4 1





Source GFCS: <http://www.wmo.int/gfcs/what-are-climate-services>





# Training Phase 1



**GMES  
AND AFRICA**

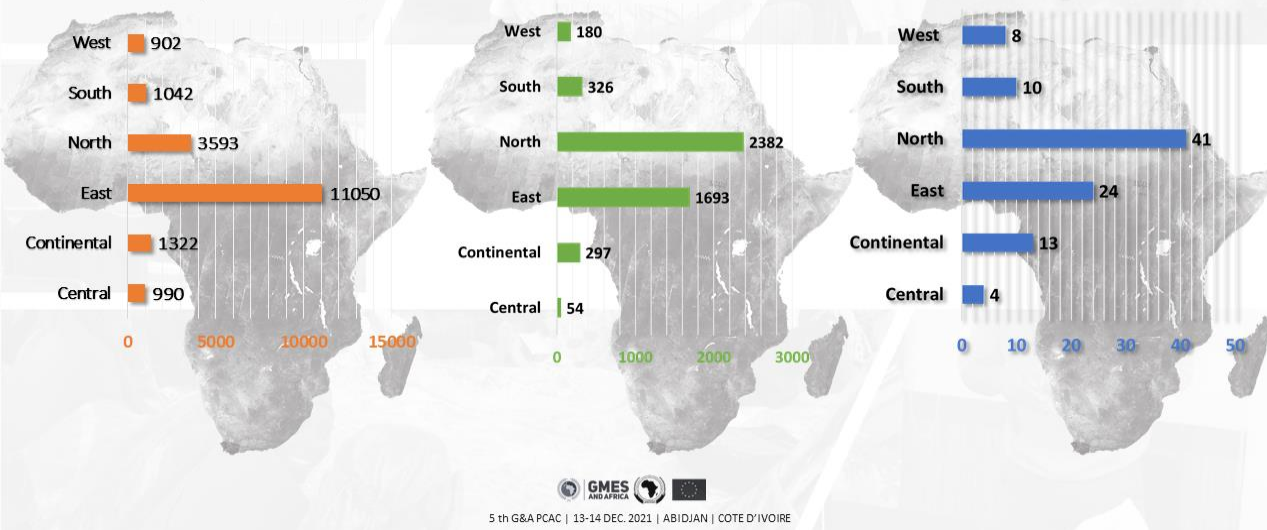
## Trainings, numbers x regions

Provisional i.e., before integration of Consortia final reports

18899 days of Training

4932 participants

100 training delivered



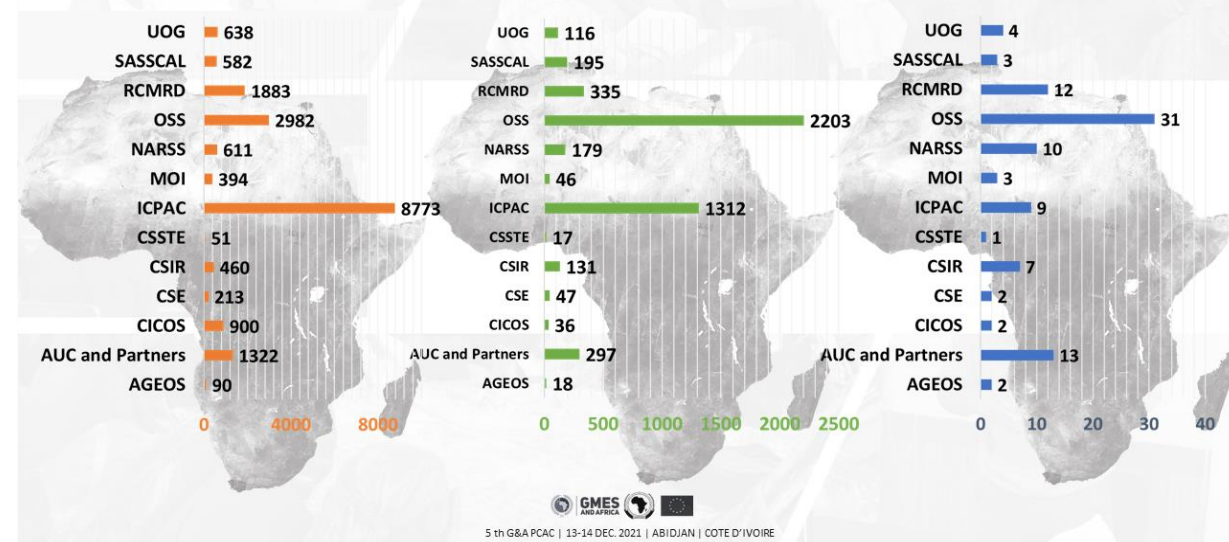
## Trainings, numbers x consortia

Provisional i.e., before integration of Consortia final reports

18899 days of Training

4932 participants

~100 Trainings







# CHALLENGES / OPPORTUNITIES

- Harnessing existing capacities and promotion of new capacities
- Engagement of Private sector and Academia
- Coordination and synergies between EO programs and initiatives

## Data and Infrastructures



- Access to data
- Access to products
- Maintenance of existing EO stations,
- Optical fiber network

## Policies



- Outdated national policies that limit the use and sharing of EO data (security, commercial aspects)

## Know How



- Existing expertise
- Regional and national institutions (OTJT, Cost, Turnover)

## Services



- User Uptake
- Cascade of value addition vs cascade of users

- Cloud computing
- Internet penetration
- Mobile technology
- FOSS
- New space technologies
- AU-EU agreement
- Copernicus data
- Digital Earth
- AfriConnect

- AUC, RECs, UN organisations

- PPP,
- North-South and South-South partnerships,
- Distance learning platforms

- Bottom-up, User driven/pull approach
- Copernicus services



# Challenges facing Newspace EO companies

## EO Companies



Lack of proper partnerships among the companies



Legislations and regulations



Low uptake of products and services



Skills gap



Low access to funding

# Resource Mobilization: Need for PPPs and IPs



Governments need to strengthen the ecosystem by introducing more flexibility and commercial orientation to enhance the space environment and make it more accessible to new entrants.



Need to improve policies for access to public funds, government grants, and other essential factors stimulating technology development and its commercial uptake (scaling-up)



Non-monetary services, including networking, coaching and mentoring. They are important instruments in increasing the odds of success of NewSpace start-ups, especially during the early stages.



Government needs to increase investments in its universities and other learning initiatives



No successful space company exists without government support



PPP is essential to unlock success for space companies in Africa



International Partners are key to catalyzing space services and business

# Value of Earth Observation in Africa



The potential impact of EO for Africa has been quantified to be worth up to \$2 billion a year



Improved use of EO data could lead to an extra \$500 million in yearly EO sales along with new job opportunities and increased fiscal revenues.

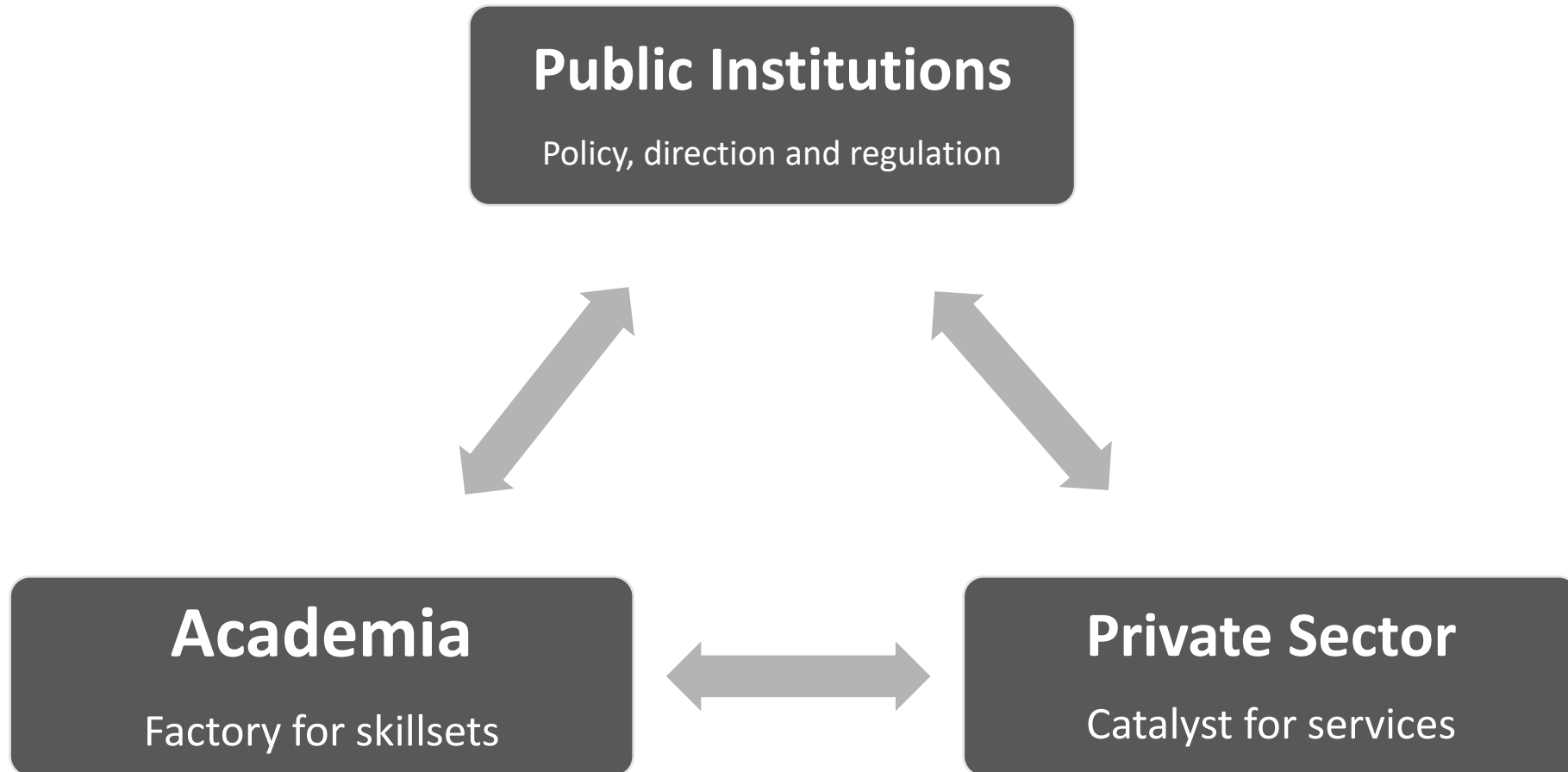


Better data could potentially be worth an extra \$900 million a year in the agricultural sector, (water savings and productivity gains)



EO Data could cut down on illegal mining, a potential savings of at least \$900 million from reduced environmental damage and fiscal evasion.

# The Triangular Relationship



# Conclusion

Taking advantage of the available opportunities, there is need for;

- Developing the downstream applications segment
- Developing tailor-made services for customized solutions
- Strengthening the ground segment
- Developing the space segment
- Collaboration and minimizing duplication of efforts

Resourcing space sector in Africa





**AFRICAN UNION COMMISSION**  
**Department of Education,**  
**Science, Technology &**  
**Innovation**

**Po Box 3243 | Roosevelt Avenue**  
**(Old Airport Area) | WK21K19**  
**Addis Ababa, Ethiopia**  
**Tel: (+251) 115517700**  
**Fax: (+251) 115517844**

**Websites: <http://au.int/>**

**<http://gmes.africa-union.org/>**

**[www.gmes4africa.blogspot.com](http://www.gmes4africa.blogspot.com)**