Conceptualizing the African Space Programme

AMCOMENT Task Force Meeting

11 September 2016

Purpose

Present the key elements of the African Space Policy and Strategy and the context for unpacking the user requirements of the African meteorology community

January 2016 AU Summit Decision

- African Space Policy and Strategy approved by the AU Assembly
- The AU Space Working Group to coordinate the development of an Implementation Plan
- The AU Space Working Group to develop an appropriate Governance Framework

Space Policy Goals

1. To use space science and technology to derive optimal socio-economic benefits that improves the quality of lives and creates wealth

2. To develop and maintain indigenous infrastructure and capabilities that services an African market

Addressing user needs

- Improve the economy and quality of life
- Address the essential needs of the African market
- Development of services and products using African capacities
- Develop requisite human resources to address user needs
- Maintain efficiency and sustainability

Identified user needs

- Disasters
- Health
- Energy
- Climate
- Water
- Weather
- Ecosystems
- Biodiversity
- Peace & Security
- Education
- Communication
- Trade & Industry
- Transport
- Infrastructure

Technical requirements

User Needs	Earth Observation											Navigation and Positioning	Satellite Communications	Space Science and Astronomy
	Spatial Resolution								Temporal Resolution					
	< 50cm	50cm-1m	1m-2.5m	2.5m-5m	5m-10m	10m-20m	20m-30m	>30m	Daily	Seasonal	Annual			
Disasters	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓	✓	✓
Health					✓	✓				✓		✓	✓	
Energy				✓	✓	✓					✓	✓	✓	✓
Climate					✓	✓			✓			✓		✓
Water		✓	✓	✓	✓	✓	✓	✓		✓		✓		
Weather		✓	✓	✓	✓	✓	✓	✓	✓			✓	✓	✓
Ecosystems				✓	✓	✓	✓	✓		✓		✓		
Agriculture				✓	✓	✓	✓	✓	✓			✓	✓	
Biodiversity				✓	✓	✓	✓	✓			✓	✓		
Peace, Safety and Security	✓	✓	✓		✓			✓	✓			✓	✓	✓
Human Migration and Settlements		✓	✓	✓							✓	✓	✓	
Education and Human Resources				✓	✓	✓	✓	✓			✓	✓	✓	✓
Communications												✓	✓	✓
Trade and Industry			✓	✓	✓	✓	✓	✓		✓		✓	✓	
Transport		✓	✓	✓	✓	✓	✓	✓			✓	✓	✓	
Infrastructure			✓	✓	✓	✓			✓			✓	✓	

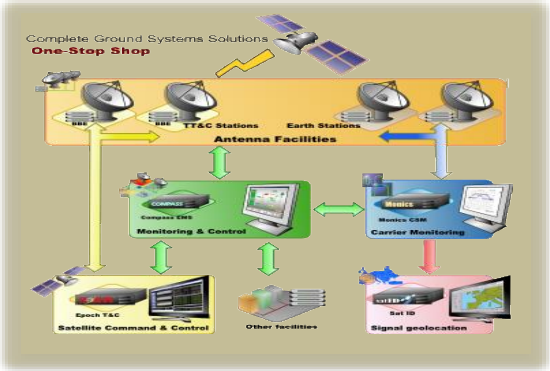
Space Applications

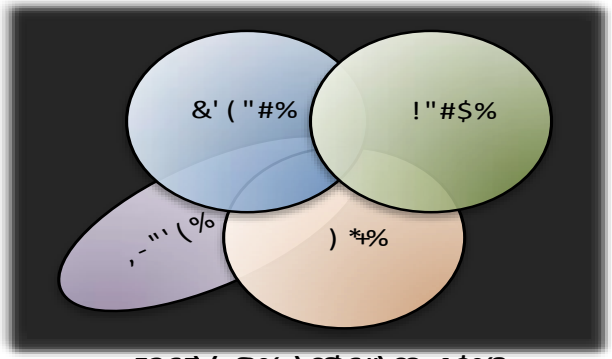
- Develop a data sharing policy
- Timely access to the right datasets
- Provision of appropriate services and products
- Robust processing capabilities
- Ensure all levels of government are able to access data through a centralised portal
- Provide geospatial and scientific data for R&D and education
- Provide geospatial data for commercial exploitation

Accessing space services

- Use existing space infrastructure
- Promote capacity building for accessing space services
- Adopt a data sharing framework
- Develop and increase our asset base
- Establishment of regional and sub-regional centers of excellence

Space Mission Concept





Enabling Technologies

- Develop a fully indigenous capability for the medium to high-resolution payloads and subsystems
- Develop the SAR payload and subsystem requirements
- Develop a geostationary communications satellite with indigenous African participation

Space Mission Operations

- Develop AIT facilities and design centers to support satellite manufacturing facilities
- Develop ground segments for TTC to support satellite operations and data retrieval
- Develop space segments for housekeeping and health of satellites
- Secure orbital slots for use by indigenous satellites

Developing the regional market

- A people centered, market based industrial capability
- Globally competitive African space programme
- Promote public private partnerships
- Coherent development, upgrade and operation of African space infrastructure
- R&D led industrial development
- Use indigenous space technologies, products and services

Industrial development

- Develop an industrial framework to unlock industrial opportunities
- Building an industrial base to support Africa's requirements
- Maximising the benefits of innovation and technology transfer into and out of the space sector
- Creating an enabling environment for small and medium enterprises

Good governance and management

- Establish an organisational framework
- African financial support as the main funding source
- Promote knowledge sharing
- Monitor and evaluate space activities
- Regulate space activities
- Maintain an awareness campaign

Coordinating the African space arena

- Promote partnerships across all sectors
- Commit funds to optimise and improve effectiveness
- Harmonize and standardize all infrastructure
- Establish communities of practice
- Preserve the long-term sustainability of outer space
- Secure the space environment for Africa’s use

Infrastructure

- CoEs and CoCs in the five regions
- Building new and expanding existing AIT centers
- Vicarious calibration facilities
- Data banks and high performance computing centers
- R&D centers
- Complementarities between space-based and in-situ infrastructure

Promoting international cooperation

- Space in Africa, for Africa and by Africans
- Ensuring a reasonable and significant financial and/or social return
- Respect international agreements
- Intra-continental partnerships must be promoted

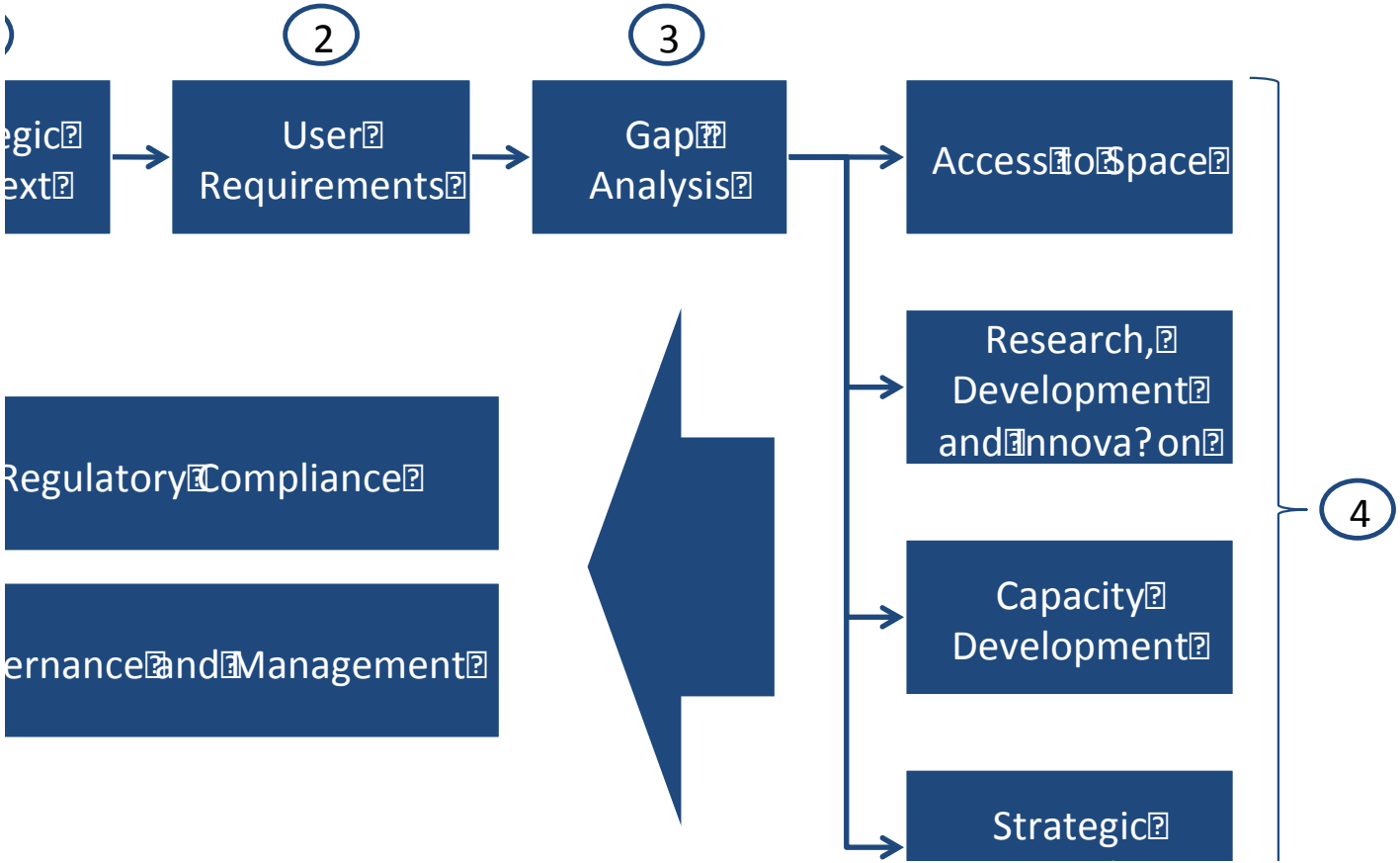
International Partnerships

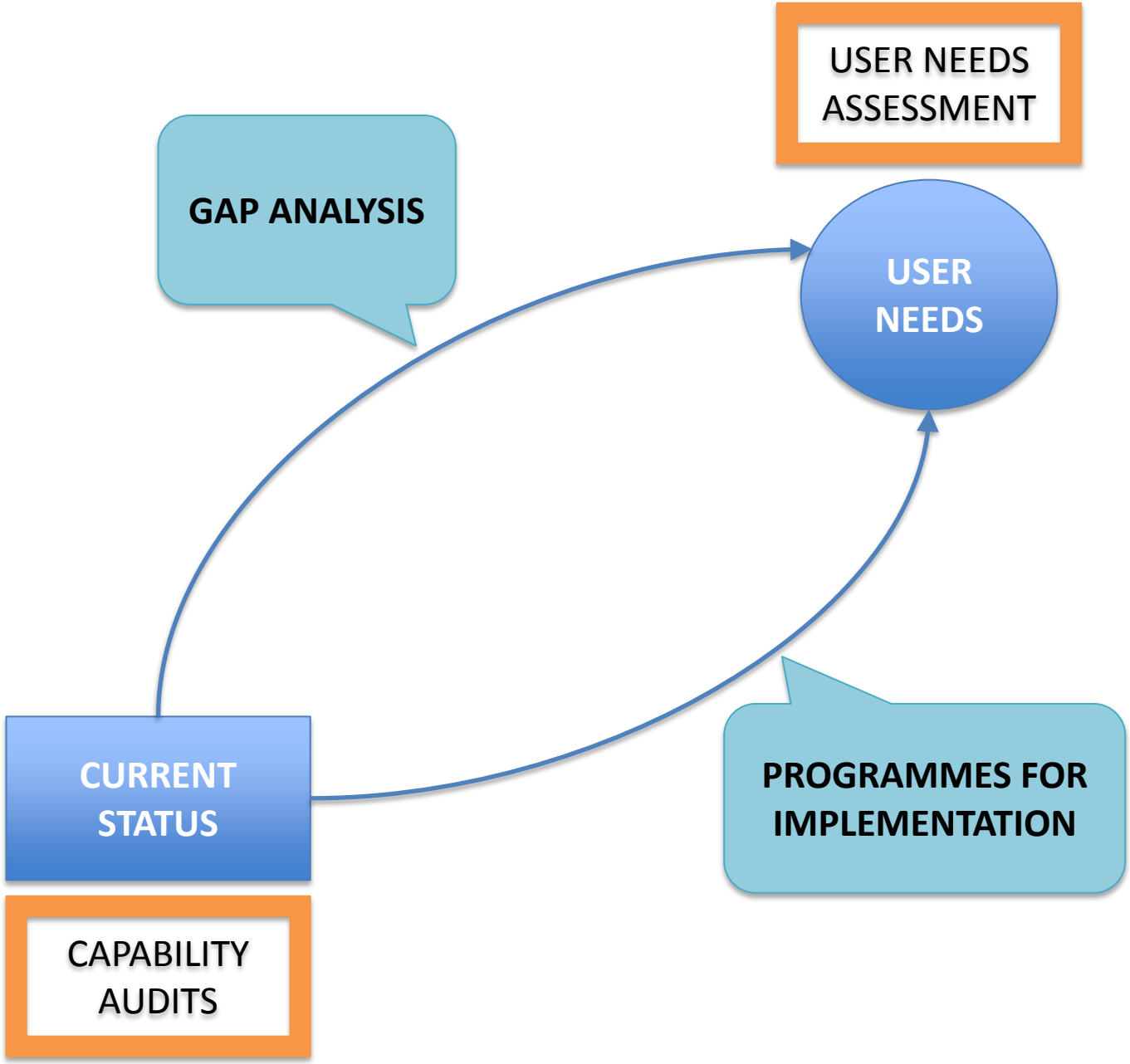
- Establishing a pan-African cooperation and partnership framework
- Cooperation agreements – reducing the space divide and technological gaps
- African academia to establish a partnership agreement with global networks
- African space infrastructure positioned as a global infrastructure

Work Breakdown Structure

Critical Success Factors
Operational Requirements
Communications

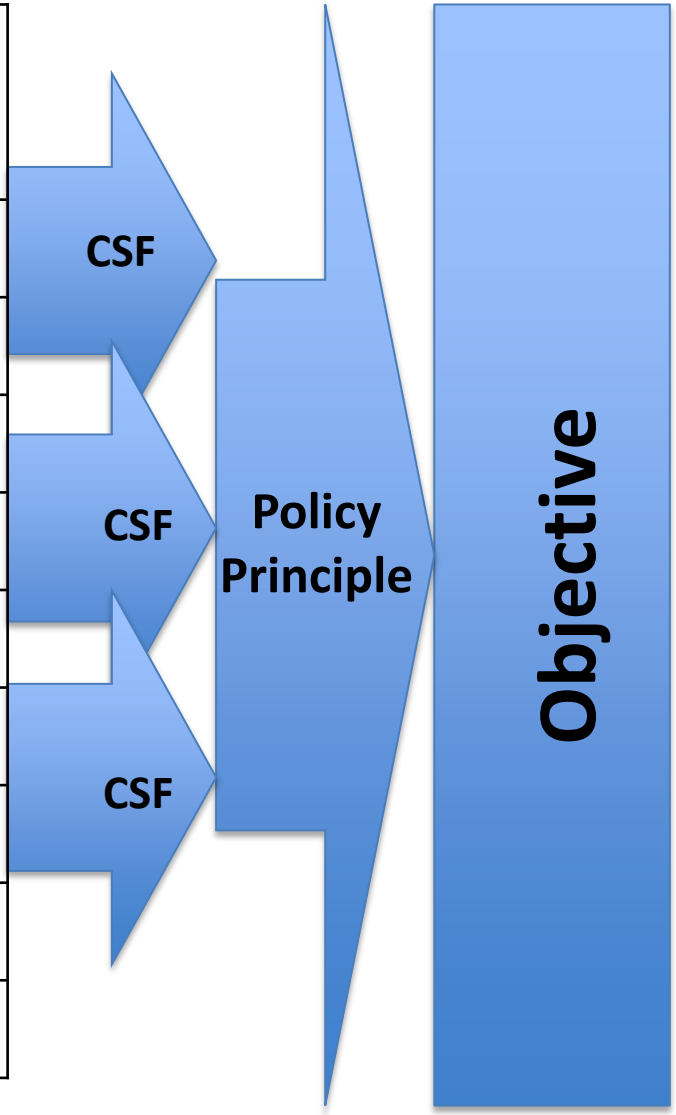
ill be conducted in a rough sequential order, with some degree of overlap,
d next.




USER NEEDS ASSESSMENT
GAP ANALYSIS
USER NEEDS
CURRENT STATUS
PROGRAMMES FOR IMPLEMENTATION
CAPABILITY AUDITS

Planning Logic

Activity	Action Steps	Performance Benchmark	Deadline



THANK YOU

Sub-Areas

- Global Numerical Weather
- Prediction
- Regional Numerical Weather
- Prediction
- Synoptic Meteorology
- Nowcasting and Very Short Range
- Forecasting

Sub-Areas

- Seasonal and Inter-annual
- Forecasts
- Aeronautical Meteorology
- Atmospheric Chemistry
- Ocean Applications
- Agricultural Meteorology
- Hydrology

Most Critical Observations

- 3D Humidity Field
- 3D temperature field
- Cloud Cover
- Cloud Water/Ice Amounts (3D distribution)
- Land Surface (skin) Temperature
- Ozone
- Precipitation
- Sea Surface Temperature

Most Critical Observations

- Soil Moisture
- Surface Air Humidity
- Surface Air Temperature
- Surface Pressure (over land)
- Surface Wind
- Vegetation Cover
- Wind (3D) - vertical and horizontal components

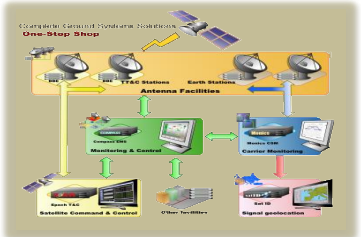
Mission Segments

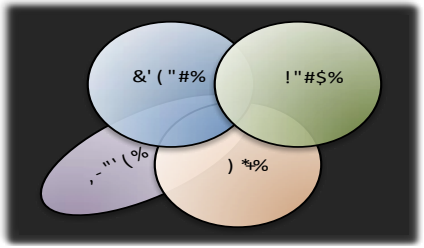
SPACE

USERS

GROUND

DATA





PRODUCTS

GOVERNANCE