



ARCSSTE-E'S Postgraduate Programmes & GMES Project: **the journey so far**

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Presentation Outlines

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- ❖ ARCSSTE-E Core Activities
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 - **Space Education Outreach programmes**
 - Technical Meetings
 - **GMES & Africa Project (CSSTE)**
- ❖ Conclusion



Introduction

- Capacity building in Space Science and Technology as well as enhancement and retention of existing capacity, are critical for developing competencies to efficiently respond to societal challenges and addressing sustainable development.

CAP. Building + Trainings = Sustainable Knowledge

- The UN General Assembly has recognised the need to build indigenous capacities in Space Science and Technology about 36 years ago especially in the developing countries in an effort to haul the World's poorest people out of misery and restore/nurture the damaged environmental web that sustains life.



UN Regional Centres (1)

United Nations General Assembly Resolutions

- **37/90 of 10th December 1982 – UNISPACE '82**

'That the United Nations Office for Outer Space Affairs (UNOOSA), through its Programme on Space Applications should focus its attention, inter alia, on building of indigenous capacities for the development and utilization of Space Science and Technology, particularly at the local level'

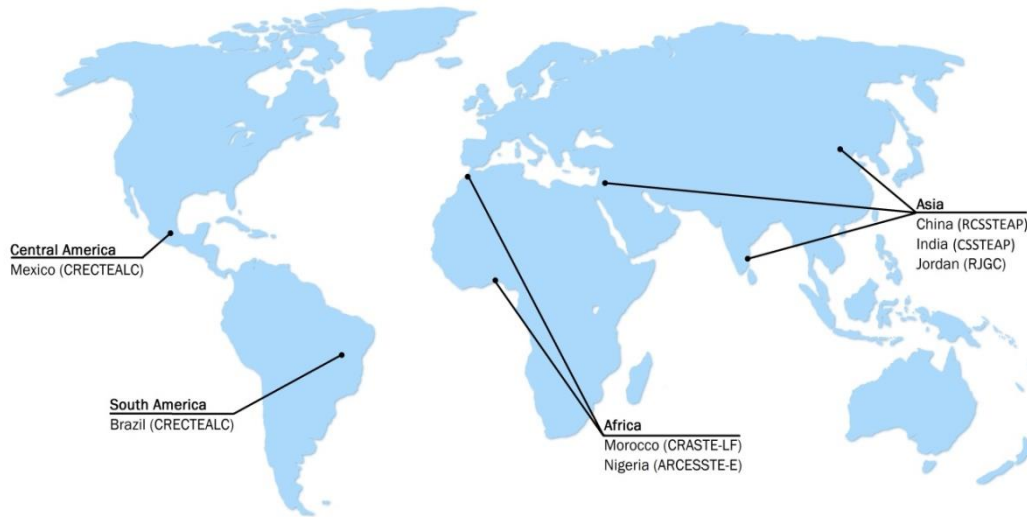
- **45/72 of 11 December, 1990 – UN-COPUOS**

'That the UN should lead, with the active support of its specialized agencies and other international organisations, an international effort to establish Centres for Space Science and Technology Education at the regional level in existing national/regional educational institutions in the developing countries'



UN Regional Centres (2)

Regional Centres for Space Science and Technology Education
(affiliated to the United Nations)



- **India** (inaugurated 1995)
- **Morocco** (inaugurated 1998)
- **Nigeria** (inaugurated 1998)
- **Mexico/Brazil** (inaugurated 2003)
- **Jordan** (inaugurated 2012)
- **China** (inaugurated 2014)

- Same curriculum used by all centres
- Curriculum developed by international committee of experts, under auspices of UNOOSA
- Certificate endorsed by UNOOSA
- Yearly report of academic programme presented at COPUOS meetings (February & June)
- Collaboration between regional centres



About ARCSSTE-E

- Established 15 September, 1998
- Located on Obafemi Awolowo University (OAU) campus, Ile-Ife
- Tripartite agreement among UN, FGN and OAU
- Mandates:
 - (i) develop, through in-depth education, an indigenous capability for research and applications in the core areas of SST
 - (ii) undertake space education outreach programmes to create public awareness of the benefits of space
- Also serves as NASRDA's Centre for Space Science and Technology Education (CSSTE)

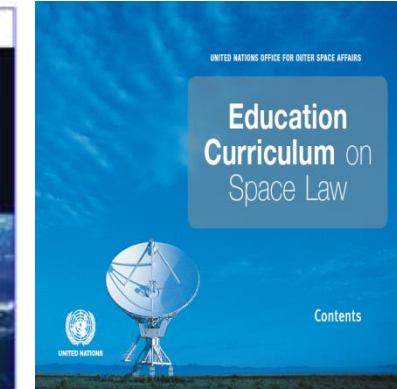
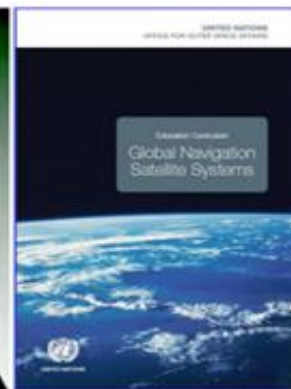


Postgraduate Programmes

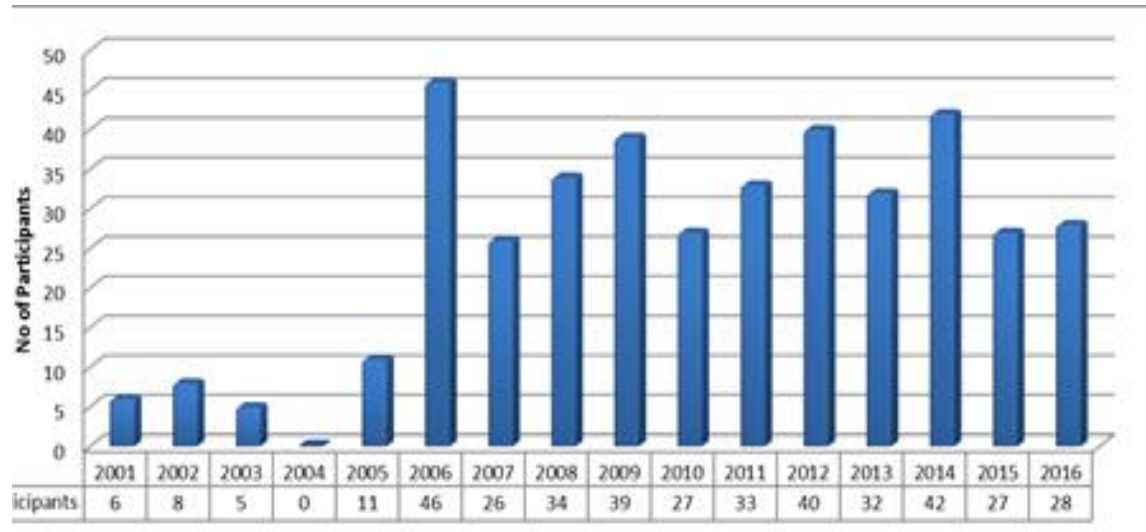


Postgraduate Diploma (PGD) programme (1)

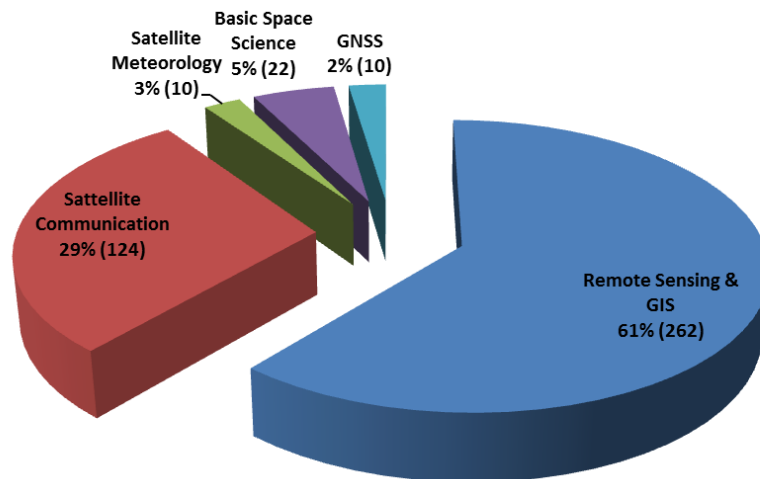
- 9-month Post-graduate Diploma Programme
- 6 thematic areas of Space Science and Technology
 - Remote Sensing/Geographic Information Systems (GIS)
 - Satellite Communication
 - Satellite Meteorology/Global Climate
 - Basic Space Science/Atmospheric Physics
 - Global Navigation Satellite Systems (GNSS)
 - **Space Law ???**



Postgraduate Diploma (PGD) programme (2)

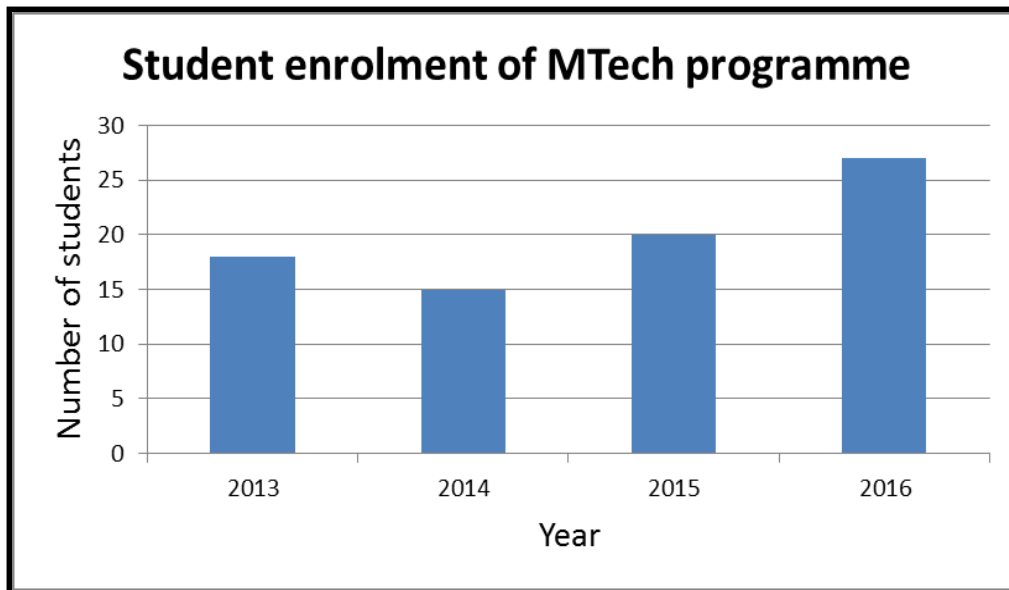


Botswana	2
Cameroon	30
Congo DRC	1
Ethiopia	4
Gambia	1
Ghana	7
Kenya	16
Liberia	11
Malawi	7
Nigeria	286
Sierra Leone	1
Sudan	13
South Africa	1
Tanzania	5
Uganda	10
Zambia	3
Zimbabwe	6
Total	404



MTech. (Space Science & Technology)

- **Duration:** 18-month MTech. (SST) in five key areas of Space Science and Technology (SST) Education
- **Collaborating University:** Federal University of Technology, Akure (FUTA)



Space Education Outreach Programmes



Workshops (1)

 African Regional Centre for Space Science and Technology Education in English (ARCSSTE-E)
Obafemi Awolowo University Campus, Ile-Ife, Nigeria.
(AFFILIATED TO THE UNITED NATIONS)
in collaboration with
National Space Research and Development Agency
(Federal Ministry of Science and Technology)

cordially welcome you to

ZONAL SPACE EDUCATION WORKSHOP

Theme: **SPACE FOR ALL:
CREATING AWARENESS
AND INSPIRING STUDENTS**

to be declared opened by
Dr. Ogbonnaya Onu
Hon. Minister of Science and Technology

Date: 21st-22nd FEBRUARY, 2017 **Venue:** C & S COLLEGE, SABO-OKE, ILORIN

Chief Host:
Prof. Seidu Onailo Mohammed
Director General/CE NASRDA

Dr. Ganiyu I. Agbaje
Director/ICE ARCSSTE-E

Engr. Musa Ayinla Yeketi
Hon. Commissioner of Education and Human
Capital Development, Kwara State.



www.arcsstee.org.ng



- Students and teachers drawn from 32 public and private Secondary Schools in Kwara State.
- ARCSSTE-E technical staff carried out presentations in various field of space science and technology.



Workshops (2)



Reaching out nationwide



LOKOJA



UYO

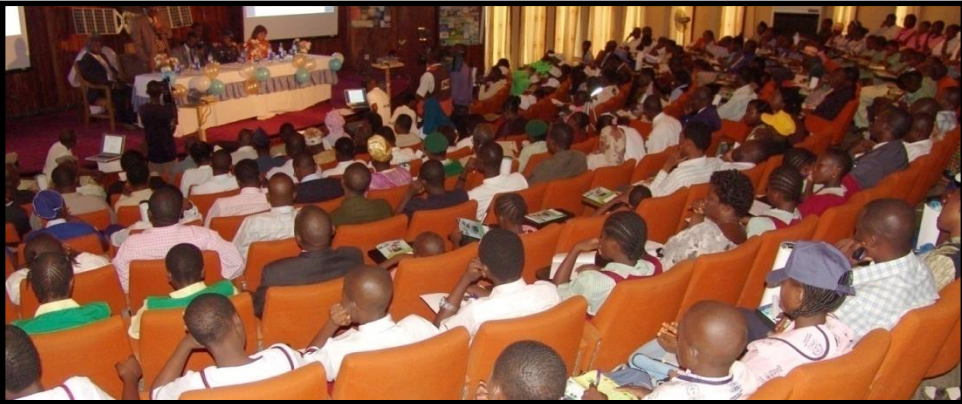


LAGOS



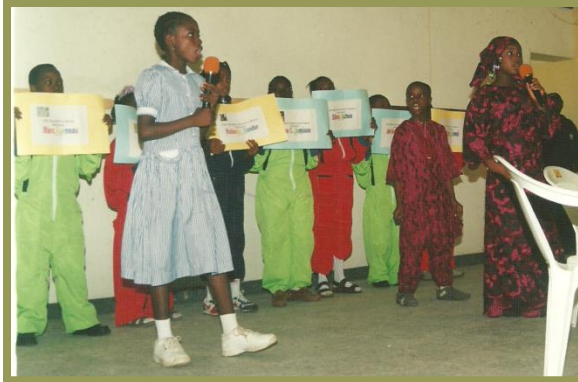
Space Clubs (1)

ARCSSTE-E Space Club Officially Inaugurated On May 18, 2007 by Air Vice Marshal Dan Baba representing the Chief of Air Staff



Space Clubs (1)

Primary School Activities

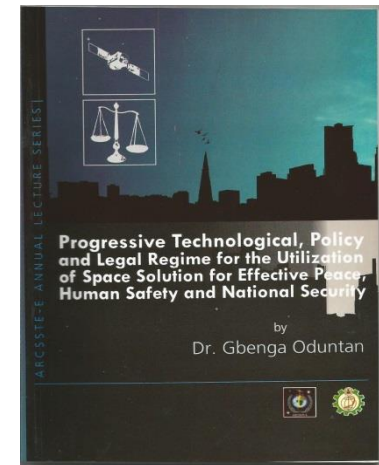
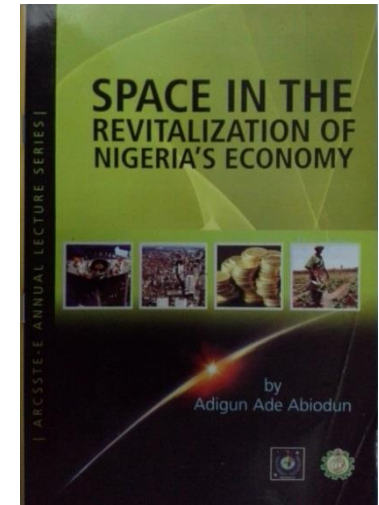


Technical Meetings & Collaborations



Distinguished Annual Lectures

- 1st lecture delivered on 13th October, 2011, by Dr. Adigun Ade Abiodun (former UN Expert on Space Applications) on “**Space and the Revitalisation of Nigeria’s Economy**”
- 2nd lecture delivered on 10th November, 2012, by Gbenga Oduntan (of Kent University, UK) on “**Progressive Technological, Policy and Legal Regime for the Utilisation of Space Solutions for Effective Peace, Human Safety and National Security**”
- 3rd lecture delivered on 8th October, 2013, by Carla Sharpe (SKA South Africa) on “**Sustainable aerospace business and strategy in developing nations**”
- Lectures published in form of monographs and have been made publicly available



Overview of GMES & Africa Project

Multi-scale Flood Monitoring and Assessment Services for West Africa

***Project between 8 Partners From 5 countries of West Africa**

1. CENTRE FOR SPACE SCIENCE AND TECHNOLOGY EDUCATION (CSSTE), NIGERIA
2. WEST AFRICAN SCIENCE SERVICE CENTRE ON CLIMATE CHANGE AND ADAPTED LAND USE (WASCAL), Cote D'Ivoire.
3. VOLTA BASIN AUTHORITY (VBA), Burkina Faso.
4. UNIVERSITY of GHANA (UG), Ghana.
5. INSTITUT SUPÉRIEUR D'ÉTUDES SPATIALES ET DES TÉLÉCOMMUNICATIONS (ISESTEL), Burkina Faso.
6. COUNCIL FOR SCIENTIFIC AND INDUSTRIAL RESEARCH - WATER RESEARCH INSTITUTE (CSIR-WRI), Ghana.
7. NATIONAL WATER INSTITUTE (INE-NWI), Republic of Benin.
8. CENTRE UNIVERSITAIRE DE RECHERCHE ET D'APPLICATION EN TÉLÉDÉTECTION (CURAT), Cote D'Ivoire.

***Grant Awarded in Dec., 2017**

*** 36 months life time**



Project implementation Location(s)

1. **Nigeria;** Ogun-Osun River Basin, (Lagos, Abeokuta, & Ibadan)
2. **Burkina Faso;** Bobo-Dioulasso, Ouagadougou,
3. **Ghana;** Black Volta Basin Areas (Lawra, Nadowli, Nandom and Wa West)
4. **Cote D'Ivoire;** Bandaman Basin, Koumassi, Abobo and Attecoube, areas
5. **Benin;** Ouémé Basin Areas



Basis for Project

***West African countries have experienced more devastating floods and a dramatic increase in flood events in the last decade.**

***Extreme rainfall and high variability in rainfall have been the main course of floods in the sub-region. Major rivers in the sub-region (e.g. Gambia, Niger, Senegal and Volta river systems) frequently overflow their banks as a result of extreme rainfall events, leading to severe impacts on livelihoods, food security and ecological systems.**



*

These floods affected more than 1.5 million people and resulted in the destruction of farm lands, loss of personal effects, destruction of infrastructure, outbreak of epidemic diseases and the loss of human lives (Armah et al. 2010, Paeth et al. 2011, Braman et al. 2013) & **destroying properties worth \$152 million (UN OCHA, 2009).**

▪



Disaster Management Organizations (DMOs) in the respective countries are mandated to manage and reduce the risk associated with such **disasters**. However, they often lack the capacity in terms of logistics and knowledge of flood events to optimally deliver on their mandate.

Also, use of novel information and approaches to managing floods is virtually non-existent in West Africa.

Although efforts by the DMOs and ECOWAS are commendable, a lot still needs to be done to improve the information necessary for effective monitoring and management of floods in West Africa.



Proposed Objectives

This project will seek to fill the above-mentioned gaps by:

- 1) developing, in collaboration with the respective DMOs and associated institutions (e.g. hydrological and meteorological institutions), a regularly updated regional scale flood event database for the five countries of interest,
- 2) establishing a flood forecasting system to provide near real-time information on impending floods to DMOs to allow for ample planning prior to an event,
- 3) establish an image acquisition, processing and analysis system to map flood extent during, or immediately after, flood events from RS data,
- 4) develop a damage assessment module that will assist DMOs evaluate the degree of damage after flood events and finally
- 5) enhance the capacities of DMOs to take over the service after the completion of the project.



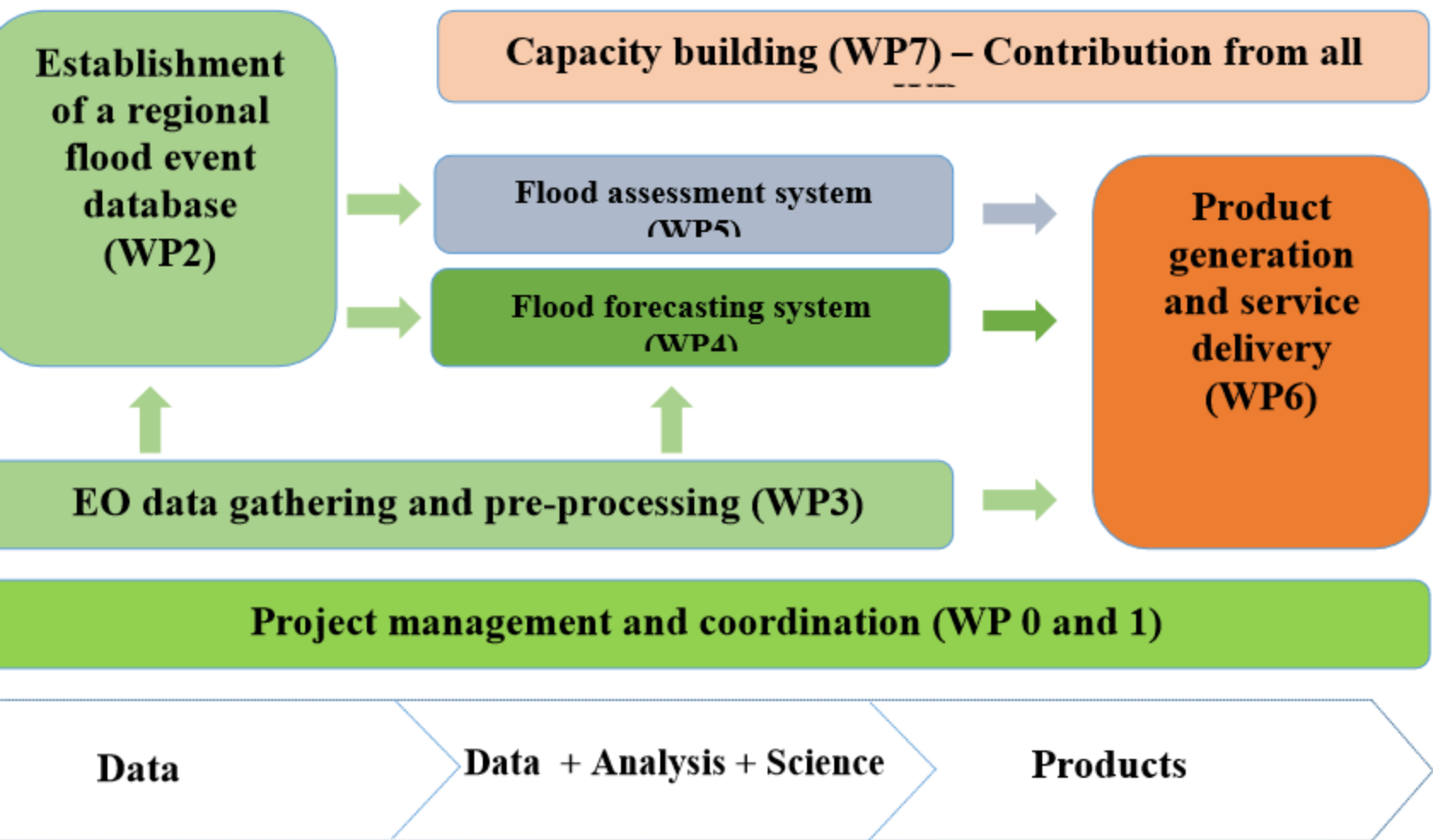


Figure 1: The Action Work Packages

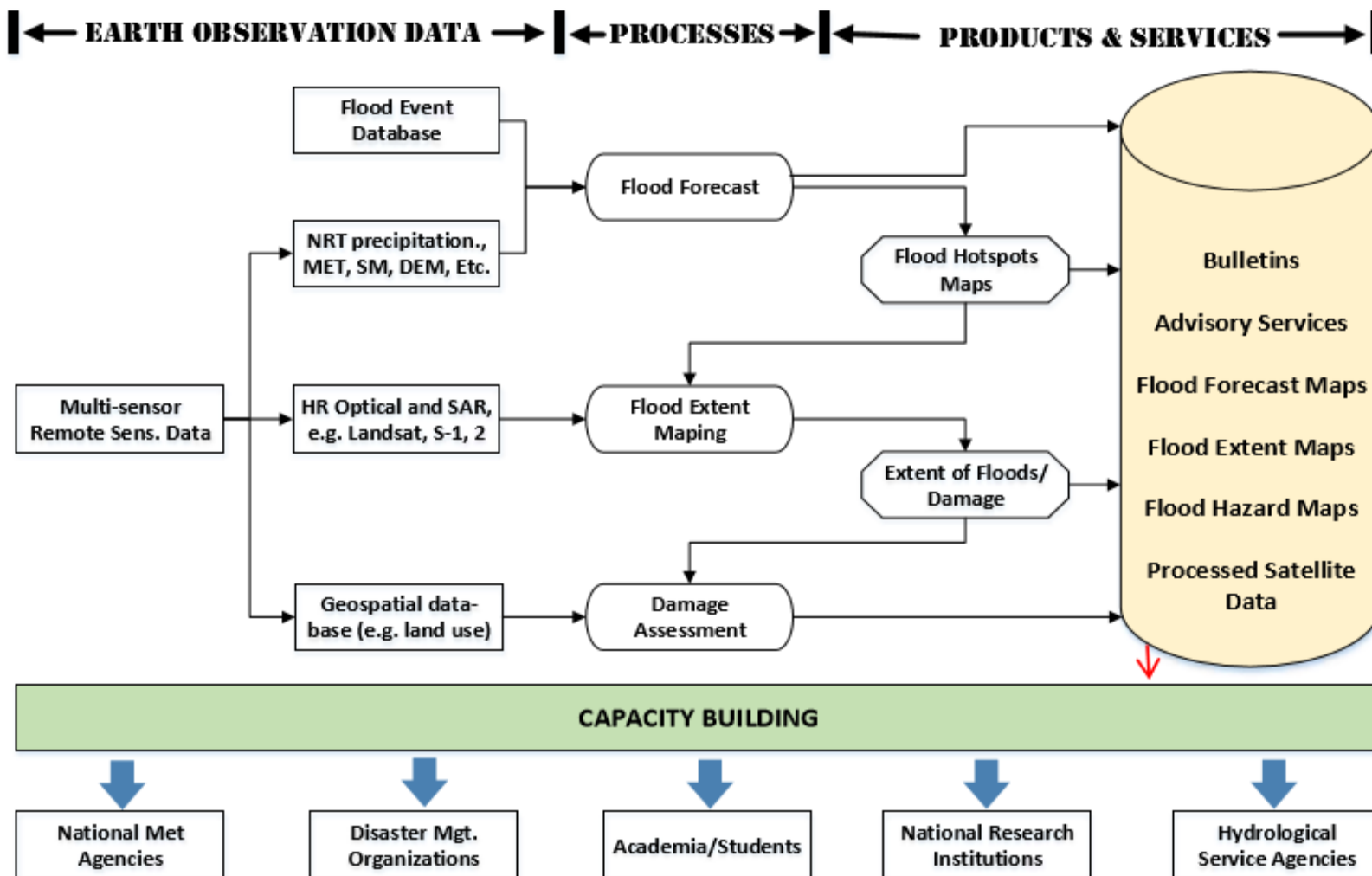


Figure 2: Methodological overview of the proposed service. NRT = near real-time; MET = meteorological data; SM = soil moisture; DEM = Digital Elevation Model; SAR = Synthetic Aperture Radar;

Expected Impact of the Project

The Project when completed will have three main categories of impact.

- * Socio-economic,
- * Technical and,
- * Policy.



Conclusion

- There is a clear evidence of the impact of the UN-assisted capacity building programme as can be observed in ARCSSTE-E's programme implementation and its achievements since its inception in November, 1998.
- **Integration of Space Science and Technology (SS&T) is necessary for the socio-economic development of developing countries.**
- The GMES project when completed would bring development to the West African Sub-region.



Thank you!



For more information, please visit, www.arcsstee.org.ng
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