

# Milestones and Challenges of ARCSSTE-E

A presentation by

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*Obafemi Awolowo University, Ile-Ife NIGERIA*

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# Profile

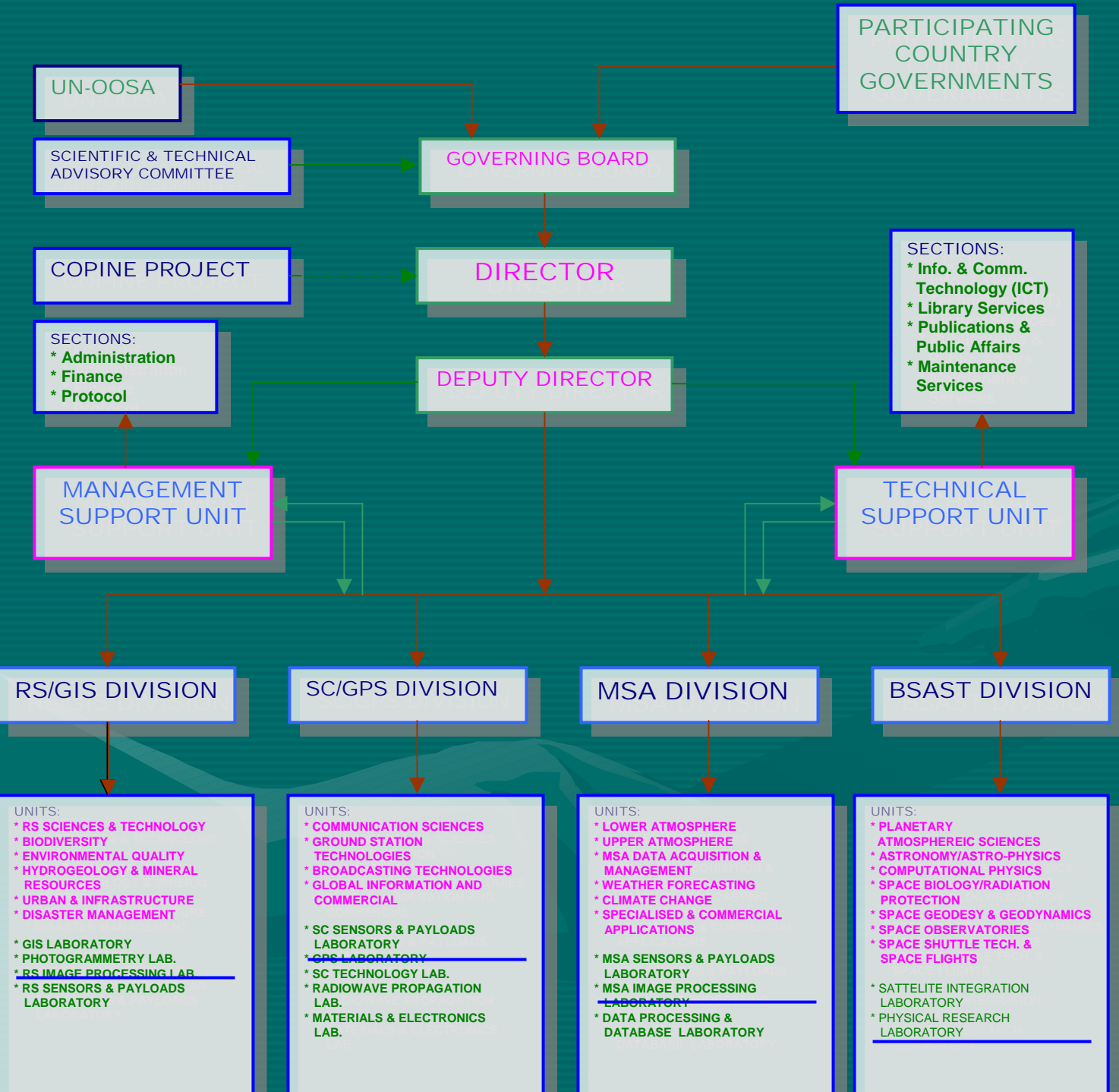


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# ARCSSTE-E Profile

- Affiliated to the UN
- Established 1998
- Staff Strength: 24
- No of past Graduates: 14
- No of Workshops Participants: 225
- Annual Budget: < \$ 200,000/yr
- Divisions
  - Remote Sensing/GIS
  - Satellite Meteorology
  - Satellite Communications
  - Basic Space Science & Atmospheric Sciences





# Mission

- To build a high quality capacity and critical mass of indigenous educator in English-speaking African countries for application of Space Science and Technology for sustainable National, Regional and Continental development.

# Vision

- Develop skills and Knowledge in four prime areas
  - Remote Sensing and Geographic Information Systems
  - Satellite Meteorology
  - Satellite Communications
  - Basic Space Science and Atmospheric Sciences.
- Ensure that participating African countries are part of the Global Information Society, using leapfrog technologies afforded by Satellite Communication

# Support

- **OOSA**
  - Curriculum Development
  - Relevant UN Publications
  - Funding: Transportation for foreign participants
  - Pledged Support for relevant pieces of equipment



# Support cont'd

- **Nigerian Government**
  - Pays local staff salaries and emoluments
  - Pledged counterpart funding for research activities
  - Encourages active participation of Nigeria nationals in ARCSSTEE organized workshops and training programmes
  - Encourages popularization of Space Science and Technology as a national programme
  - Established NASRDA (National Space Research and Development Agency) as a National warehouse and coordinating agency for all space R&D issues

# Support cont'd

- **Host Institution**
- **Obafemi Awolowo University, Ile-Ife NIGERIA**
  - Contributes a large pool of top-grade resource persons towards ARCSSTEE's programmes
  - Provides infrastructure: Accommodation, Energy, and Water supply
  - Provides a large expanse of real estate for the Centre's permanent site
  - Provides library and Health-Care facilities to staff and students of ARCSSTEE

# Support cont'd

- **RECTAS**
- (Regional Centre for Training in Aerospace Surveys)
  - Provides facilities for Remote Sensing & GIS and GPS
  - Supplies Resource Persons in Remote Sensing & GIS and GPS programmes

# Activities - Training

• Year	• Programme	• Participation
• 2000	• 1 <sup>st</sup> Post Graduate Course on Remote Sensing/GIS	– Nigeria 2 – Liberia 2 – Sierra Leone 1

# Activities – Training cont'd

• Year	• Programme	• Participation
• 2001 / 2002	• 2 <sup>nd</sup> Post Graduate Course on Remote Sensing/GIS	– Nigeria 2 – Gambia 1
	• 1 <sup>st</sup> Post Graduate Course on Satellite Meteorology & Global Climate Change	– Ghana 3

# Activities – Training cont'd

- Year
  - Programme
  - Participation
- 
- 2002 / 2003
  - 1<sup>st</sup> Post Graduate Course on Satellite Communications
  - Nigeria
  - 4

# Activities – Training cont'd

• Year	• Programme	• Participation
• 2003 / 2004 / 2005	• 2 <sup>nd</sup> PG Course on Satellite Meteorology	– Nigeria 8 – Lesotho 1
	• 2 <sup>nd</sup> PG Course on Satellite Communications,	– Kenya 2 – Tanzania 1 – Zimbabwe 1
	• 3 <sup>rd</sup> PG Course on Remote Sensing/GIS	– Liberia 1 – Zambia 1

# Activities - Workshop

Date	Programme	Target Participants	Participation
<ul style="list-style-type: none"><li>• April 9 -14 2000</li></ul>	<ul style="list-style-type: none"><li>• 1<sup>st</sup> Regional Workshop on Remote Sensing/Geographic Information Systems Applications</li></ul>	<ul style="list-style-type: none"><li>• Research Scientists</li><li>• Policy Makers</li><li>• Planners</li><li>• Engineers</li><li>• Technicians</li><li>• Practitioners in Higher Institutions of Learning</li></ul>	<ul style="list-style-type: none"><li>• 45</li></ul>



# Activities – Workshop cont'd

Date	Programme	Target Participants	Participation
<ul style="list-style-type: none"> <li>Sept 24 -29 2001</li> </ul>	<ul style="list-style-type: none"> <li>2<sup>nd</sup> Regional Workshop on Remote Sensing/Geographic Information Systems 1<sup>st</sup> Workshop on Satellite Meteorology &amp; Global Climate</li> </ul>	<ul style="list-style-type: none"> <li>Research Scientists</li> <li>Policy Makers</li> <li>Urban Planners</li> <li>Weather and Climate Forecasters</li> <li>Water Resources Managers</li> <li>Academicians</li> <li>Agriculture Offices</li> </ul>	<ul style="list-style-type: none"> <li>35</li> </ul>
	<p>Theme</p>		
	<ul style="list-style-type: none"> <li>Application of Satellite Data for Resource and Disaster Management</li> </ul>		

# Activities – Workshop cont'd

Date	Programme	Target Participants	Participation
September 16 -20 2002	<ul style="list-style-type: none"><li>• 1<sup>st</sup> Workshop on Satellite Communications</li></ul> <p>Theme</p> <ul style="list-style-type: none"><li>• The Past, Present and Future of Satellite Communication</li></ul>	<ul style="list-style-type: none"><li>• Research Scientists</li><li>• Policy Makers</li><li>• Telecommunications Practitioners</li><li>• Planners</li><li>• Telecoms Engineers</li><li>• Public Sector Agencies</li><li>• Technicians</li><li>• Academia</li></ul>	<ul style="list-style-type: none"><li>• 43</li></ul>

# Activities – Workshop cont'd

Date	Programme	Target Participants	Participation
October 13 -17, 2003	<ul style="list-style-type: none"><li>• 1<sup>st</sup> International Workshop on Space Science Applications</li></ul>	<ul style="list-style-type: none"><li>• Research Scientists</li><li>• Policy Makers</li><li>• Public &amp; Private Sector Agencies in the Application of Space Science and Technology</li></ul>	<ul style="list-style-type: none"><li>• 45</li></ul>
	<p>Theme</p> <ul style="list-style-type: none"><li>• Progress in the Applications of Space Science and Technology</li></ul>		

# Activities – Workshop cont'd

Date	Programme	Target Participants	Participation
March 1 -5 2004	<ul style="list-style-type: none"> <li>• 2<sup>nd</sup> Regional Workshop on Satellite Communications</li> </ul> <p style="text-align: center;"><b>Theme</b></p> <ul style="list-style-type: none"> <li>• Satellite Communications and the Proposed Nigeria Communications Satellite (NIGCOMSAT-1)</li> </ul>	<ul style="list-style-type: none"> <li>• Communications and Telecom Operators</li> <li>• Policy Makers</li> <li>• Military</li> <li>• Academia</li> <li>• Other Allied Stakeholders</li> <li>• Government Agencies</li> </ul>	<ul style="list-style-type: none"> <li>• 57</li> </ul>

# Activities - Others

- Signed Local MOU with:
  - The Department of Electrical and Electronic Engineering
  - The Department of Geography
- To enable high-flying students from the Post Graduate Diploma program earn a Master's Degree from the University

# Budget

- Honorarium to Resource Persons
  - 800 hrs at N5000 per hour = N 4,000,000:00
  - i.e. average of \$35 US per hour = ~ \$28,000 US for the 9 months
- Supervision of Field Trips
  - N 2,250,000 ~ (\$15,000 US)
- Practicals Laboratory
  - N1,500,000 ~ (\$10,000US)
- Running Cost of Field Trips and Experiments
  - N2,000,000 ~ (\$13,500 US)
- Personnel Cost
  - N12,000,000 ~ (\$80,000 US)
- Equipment Lease
  - N3,000,000 ~ (\$20,000 US)
- Total \$166,500  
N is Nigerian Naira where N 150 ~ \$1 US

# Sample of Publications

- Computer Networking using Satellite Radio Links
- Satellite Communications and the Internet Generation
- Rainfall and the length of the Growing Season in Nigeria
- Wavelength dependence of Aerosol Optical Depth and the fit of Ångström Law
- Investigation of Rain-bearing Convective Systems over Nigeria and Adjacent Areas Using Conventional and Satellite-Derived Data

# Research Projects

- Validation of Data from NigeriaSat-1
  - Studies in Deforestation process in South West Nigeria using data from NigeriaSat-1 and other Satellites
- Micrometeorology / Mesometeorology Research
  - Energy Balance
  - Turbulence, Refractive Index
- Estimation of Rainfall amounts from TRIMM data
  - M.Sc thesis completed
  - On-going PhD projects
- Climate Modeling
  - M.Sc thesis completed
  - On-going PhD projects



# Research Projects cont'd

- Effects of Raindrops on Transmission of EM waves in Satellite Communication
  - Polarization & Depolarization of EM waves by raindrops
- Investigations on the existence of Astronomy-related projects in local Secondary Schools
- Deforestation and Biodiversity

# Titles of Pilot Projects

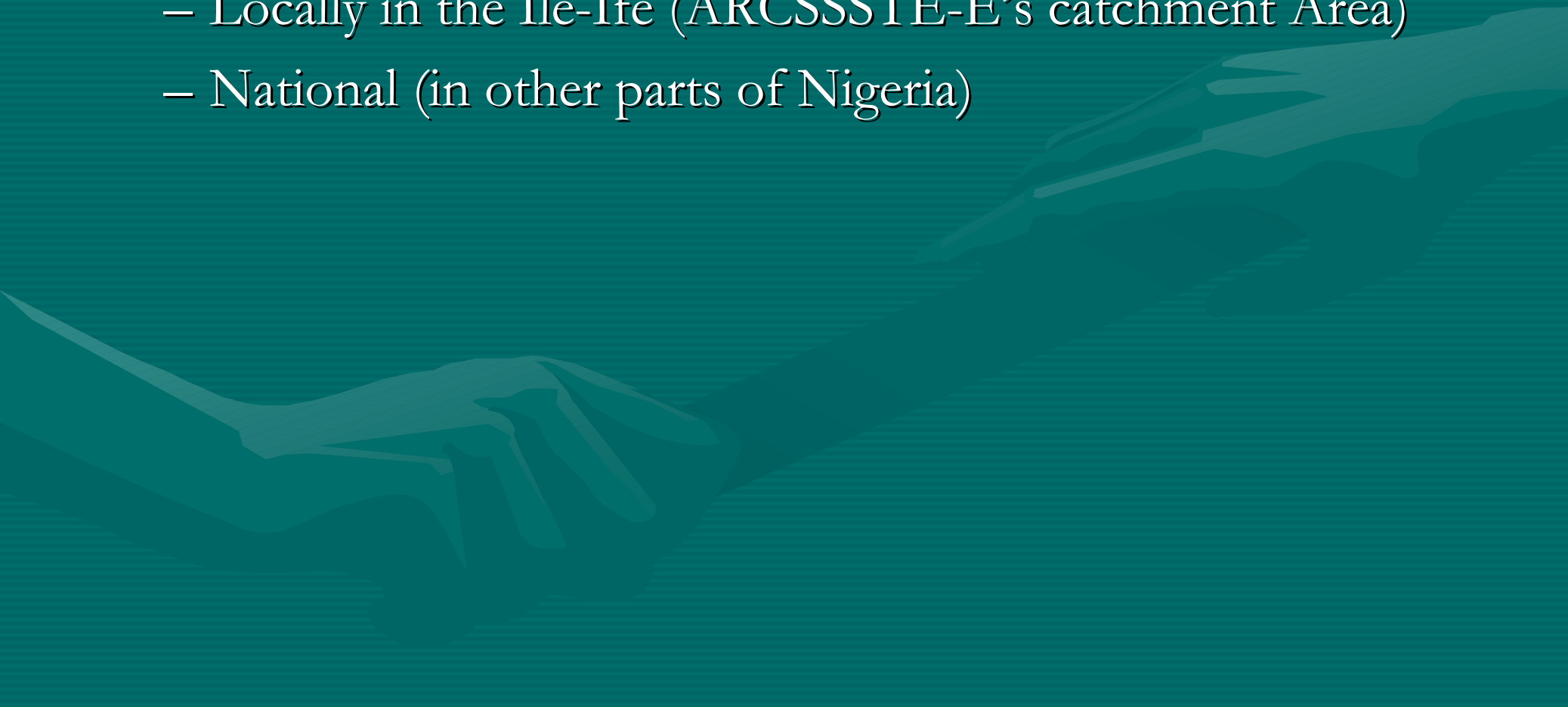
- Proposal for the Establishment of RS & GIS Office in Liberia
- Digitization of National Topographic Maps in Liberia
- Use of Satellite Imagery in the Inventory of Land Degradation Areas in Barki Ladi and Bokkos Local Government Areas, Plateau State
- Groundwater Targeting in basement Complex Rocks of Jos-Plateau using RS Techniques
- Land-use / Land cover Change Depletion of Barki Ladi, Bokkos and Shendam using Satellite Data

# Titles of Pilot Projects cont'd

- Interaction Between Tropical Mid Latitude Weather Systems
- Radiation Estimates from Satellite
- Land-use in Greater Banjul Area, Gambia, West Africa
- Rainfall Estimates from Satellites-new Algorithms
- Nowcasting of Tropical Systems with Aid of Satellite in Africa

# Outreach Programmes

- To Elementary and High Schools
  - Locally in the Ile-Ife (ARCSSSTE-E's catchment Area)
  - National (in other parts of Nigeria)



# International Collaboration

- Uppsala University, Sweden
  - Bayreuth University, Germany
  - ICTP, Italy
  - WMO
  - IRI, Columbia University USA
- 

# Needs

- Funds, Funds, Funds
- Equipment
- Academic Linkages and Exchange programs
- Collaborations with world-class National and Regional Laboratories
- Partnering with other national and international Centres of Excellence
- Research Collaborations with sister UN Centres

# Limitations and Lamentations

- Wide Digital Divide
- Poor and Inadequate funding
- Limited Knowledge sharing process
- Inadequate Infrastructure (Hardware & Software) and Manware
- Critical Mass of skilled personnel not yet attained in many African countries
- Data access is still a big challenge for many researchers.

# Conclusion

- These Milestones are a testament of salutary courage to accomplish much in the face of tremendous opposition, meager resources and so little motivation.
- More resources will result in more dividends



Thank YOU

