

Strategies for implementation of Space Science and Technology programmes in developing economies: Case study of Ghana.

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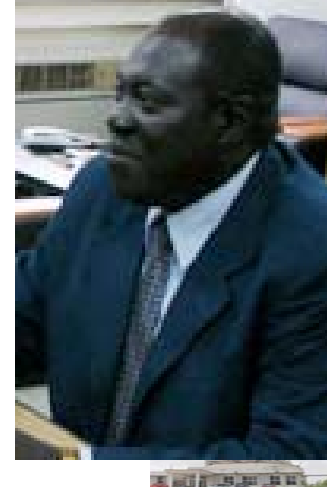
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Brief history of GSSTC:

- Established on January 1, 2011
 - Initiative of MEST - Hon. Sherry Ayittey (Minister)
 - Interim implementation Steering committee in place.
 - Prof. F. K. Allotey (Chairman),
 - Prof. E. H. K. Akaho (Director-General)
- Ghana Atomic Energy Commissions tasked to host the Centre at the Graduate School of Nuclear and Allied Sciences



The Graduate School

- Jointly Established by **Ghana Atomic Energy Commission** and **University Of Ghana** in 2006 in collaboration with the **International Atomic energy Agency (IAEA)**
- IAEA African regional designated centre for human capacity building in Nuclear Science and Technology



Vision

To uncover and exploit the capabilities of Space Science and Technology for the benefit of humanity, for national socio-technological advancement and development through education, cutting-edge research and training.



Strategies

- Strategically placed under Graduate School of Nuclear and Allied Sciences to:
 - facilitate human resource development through MSc and Mphil Programmes.
 - take advantage of the concentration of highly skilled scientists and technicians
 - Experience in handling sensitive nuclear equipment
- Few personnel in Space Science related fields help train more young scientist in this field.



– Take advantage of availability of infrastructure for training MSc /MPhil students in Nuclear science.

- Miniature Neutron Source Reactor
- Accelerator facility (under construction)
- Gamma Irradiation Facility



Strategies

Ghana Space Science and
Technology Centre

2011

Ghana Space Science and
Technology Institute

2013

2016 Ghana Space Agency



Strategies

- Assessment of existing space science and technology infrastructures in all institutions around the country.
- Assessment of existing human capacity (Local and abroad)
- Publicity on benefits of Space Science and Technology
 - Policy makers
 - General population
 - Junior and Senior high Schools.



Strategies - Academic Programmes

- Based on existing infrastructure and human resource the following academic programmes have been identified:
 - Remote sensing and geographical information systems.
 - Satellite communications.
 - Satellite meteorology and global climate.
 - Atmospheric sciences.
 - Astrophysics
 - Astrobiology



Strategies - Academic Programmes

- Lecturers in various universities have been contacted all around the country and abroad to help in the human capacity build.
- Universities have start undergraduate programmes in space science and technology.
- Construction of GSSTC underway



Strategies – International Collaboration

- South Africa
 - SASA and SKA – Africa
- Nigeria
 - Nigerian Space Agency
- USA
 - NASA
- Japan
 - JAXA



Staffing

1. Material Physicist
2. Electronic Engineers
3. Electrical Engineers
4. Computer programmers
5. Environmental scientist
6. Mechanical engineers
7. High energy Physicist
8. Legal officer
9. Control engineers
10. Chemical engineers
11. Optical Physicist
12. Configuration Manager.
13. Radio Frequency engineers.

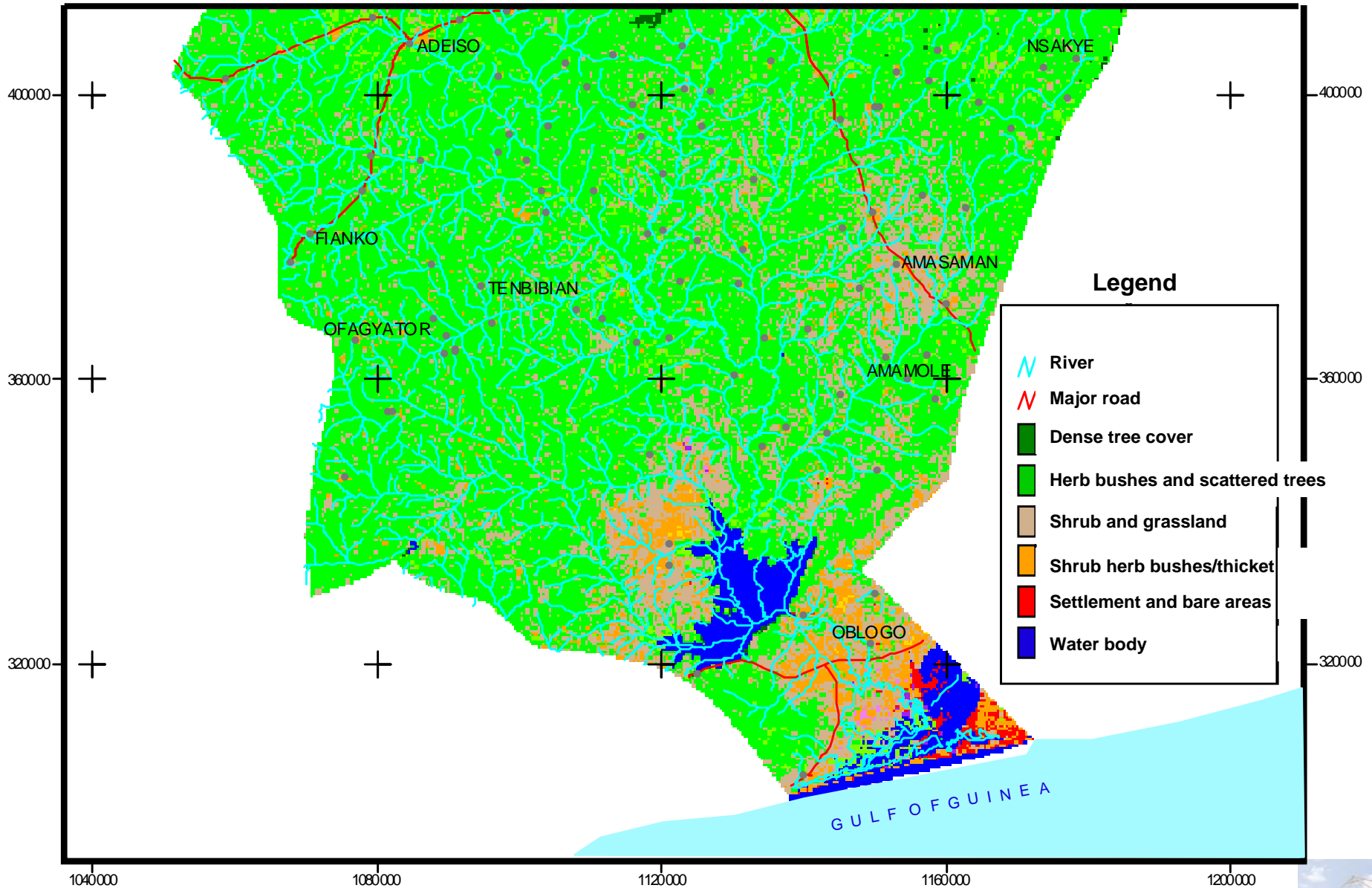


Projects/Activities

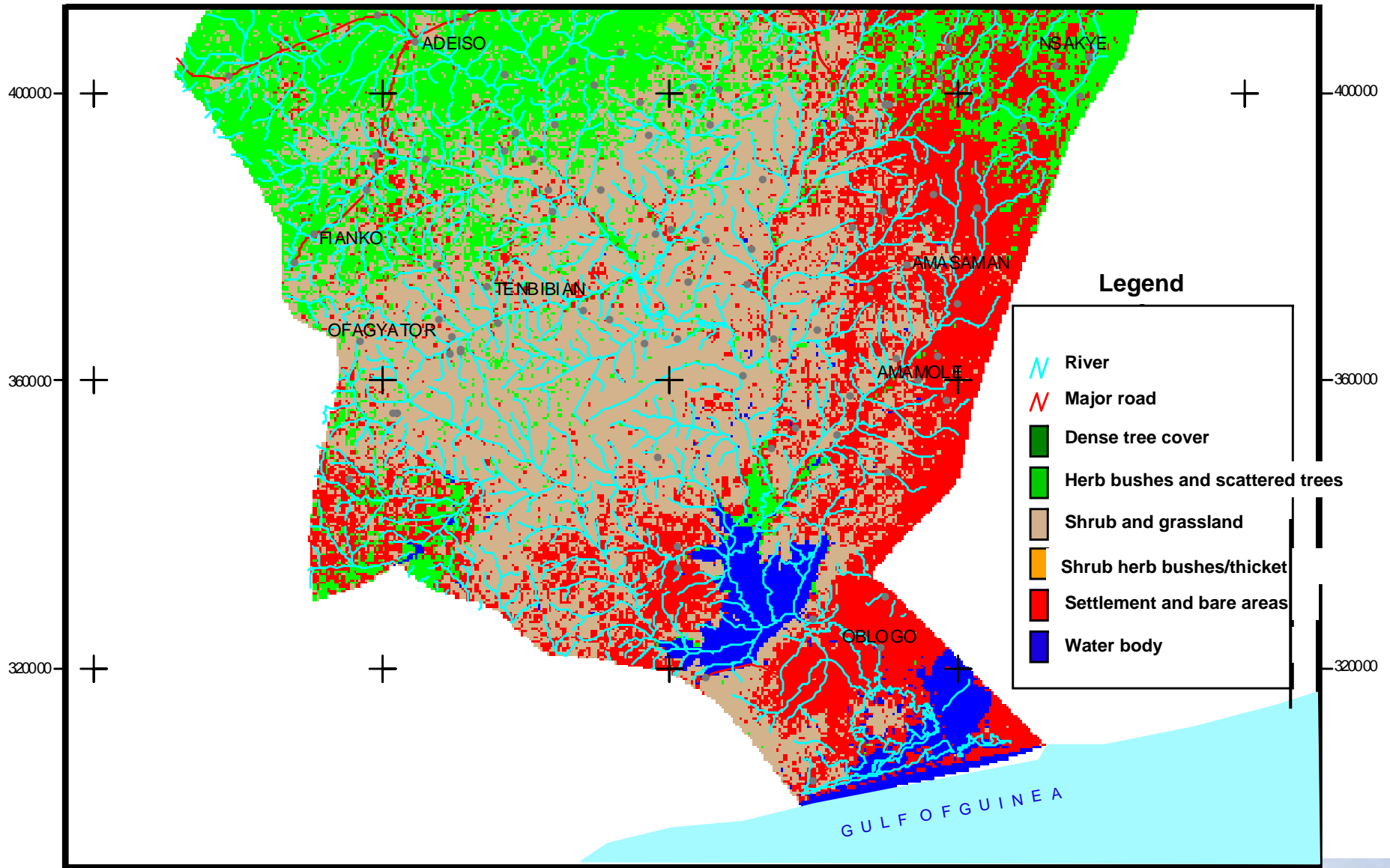
- Radio-astronomy
- Ground station:
 - As a training facility for student.
 - Data collection for research.
- Small satellite development (e.g., Cansat):
 - For research and data acquisition
 - Human capacity building
 - Ghanaians in South Africa being trained in this field to facilitate the project
- Remote Sensing application
- National Planetarium



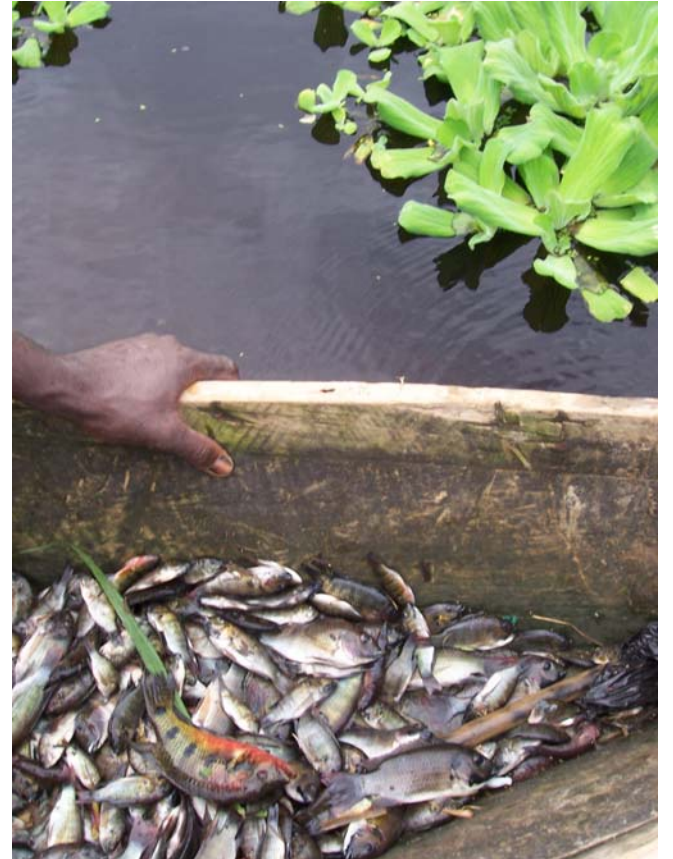
Densu Delta Wetland-Vegetation(1990)



Densu Delta Wetland-Vegetation(2000)







Projects/Activities

- Monitoring Coastal ecologies
- Monitoring of Forest cover
- Off shore drilling activities (pollution monitoring)
- Security
- Fisheries
- Tele-epidemiology
- Disaster management



Achievements

- Have identified existing 32m telecommunication antenna.
 - A property of Vodafone Ghana.
 - Built in 1981 by Government of Ghana.
 - Not been used for the past 9 years.
 - Develop mechanical, structural, and control problems.





Achievements

- In collaboration with SKA - South Africa and VLBI network, Africa we are converting the antenna.
 - Mechanical assessment.
 - Electronic/Electrical assessment.
 - Structural integrity assessment.
 - Radio frequency interference assessment.
- Ghana to lead in conversion of 16 other antennae in Africa



Achievement (3):

- The conversion process of the 32m antenna is being used to train newly employed staff reorient skilled engineers and technicians in the following fields:
 - Radio telescope engineering.
 - VLBI techniques.
 - Configuration management.
 - Control and monitoring.
 - RF engineering.
 - Mechanical/structural engineering.
 - Software engineering working group.
- The antenna has been able to rotate electronically after 9 years.



Conclusion:

- The Ghana Space programme is on course and has come to stay
- Soon we will be partners
- Motivated to
 - send human into space
 - Propose and engage in projects for the benefit of all humanity
- Collaborators are welcome for our programmes and or projects of mutual interest.



Thank you



