Space Research for Sustainable Development in Sudan

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How Research in Sudan has been utilizing and addressing space technology for Sustainable Development
University of Khartoum Cubesat Project

• Since 2010 -
WHY this research?

1. Sustainable development is important.
2. looking for answers to the question “why space technology for Sudan”?
3. To help us plan for our Space Research Centre.
4. To know what do we actually have at our university regarding space technology, and what have we been doing.
5. To prepare some document to help us with funding
What did I do?

• I looked at the M.Sc, PhD and Bachelor degree thesis of University of Khartoum.
• What topics related to sustainable development are being covered?
• categorize the research according to the Sustainable Development Goals.
SO, most of the research if found is expected to be covering these topics
Remote sensing

Agriculture:
- Agricultural Economics.
- Crop monitoring
- Adaptation mechanisms.
- Climate change effect on agriculture
- Water resource management
- Weather forecasting (temperatures, rainfall, ...)

Applications

1. NO POVERTY
2. ZERO HUNGER
3. GOOD HEALTH AND WELL BEING
4. QUALITY EDUCATION
5. GENDER EQUALITY
6. CLEAN WATER AND SANITATION
7. AFFORDABLE AND CLEAN ENERGY
8. DECENT WORK AND ECONOMIC GROWTH
9. INDUSTRY, INNOVATION AND INFRASTRUCTURE
10. REDUCED INEQUALITIES
11. SUSTAINABLE CITI AND COMMUNITIES
12. RESPONSIBLE CONSUMPTION AND PRODUCTION
13. CLIMATE ACTION
14. LIFE BELOW WATER
15. LIFE ON LAND
16. PEACE, JUSTICE AND STRONG INSTITUTIONS
17. PARTNERSHIPS FOR THE GOALS
Water resource management:

- Rivers
- Dams
- Floods
- Rain
Soil:
- Soil degradation
- Sand encroachment
- Soil depth
- Soil moisture
Remote sensing

Climate change:
- Deforestation
- Desertification
- Erosion
Applications

Remote sensing

- Costal areas
- Wildlife
Remote sensing

- Health
Remote sensing

- Urban planning
- Archaeology
- Mining
- Geology
Applications

SatCom

- Tele-Education
Remote sensing

- Mathematical sciences
- Image processing
- Ground, aerial and satellite data comparison
Surveying studies
Comparing satellite based navigation to other techniques.
Satcom

- Signal processing
- Link
- Satellite Communication technologies
Space Technology

- Nano-satellites
- Materials
Yes, Research at University of Khartoum has been utilizing space technology for sustainable development.
Conclusion

• This study surveyed 400+ Postgrad thesis, undergrad thesis and staff publications
• the library is not fully digitized yet
• The minimum number of thesis written on these topics and also the areas of research covered.
• i.e. May be there are more, but definitely not less.
• Organize a workshop
  – University of Khartoum
  – Other research bodies
  – Public and Private sector
Declaration

• Few nations have gone through all the space industry difficulties before they arrived to the magnificent capabilities they have today. The rest of nations should not go through the same. **No need to reinvent the wheel.**

• No nation should be stamped and destined to be only a consumer of space technology. We all have the right to be part of the **development and innovation.**

• Break all the barriers surrounding space technology and applications. It will be nice to see a **revolution** in space sector, just like the internet revolution or the computers.
Thank You