Space Based Application: A sustainable tool for Human to Achieve SDGs

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Presentation Outline

- Introduction
- SDGs
- Why Space a Driver & Solution?
- Space base geospatial tools.
- Conclusion
- Recommendations
Space Application Technology

Observing Systems
Global Earth Observation System of Systems

INTEGRATED

- Space-based System
- Air-based System
- Cryosphere-based System
- Land-based System
- Ocean-based System

Data Management System

- Health
- Disasters
- Forecasts
- Energy
- Water
- Climate
- Agriculture
- Ecology
- Oceans
Space based Geospatial Information

A key for monitoring, management & planning of resources for Decision making
Why Space Application?

Geospatial information is best for
✓ monitoring,
✓ Management
✓ planning
✓ Provision of precise geospatial Information

for decision making for Sustainable Development

Geospatial technology changes the traditional way of managing and monitoring the atmosphere, land, and water resources into modern digital precise spatial information
Land use  Geospatial Information

“Space for Sustainable Development”

Cities & towns
Industries
Infrastructures
Research Inst..
Space centers
Global Markets
Population
Land cover change_ Sumatra, Indonesia

Image Credit: Wijedasa et al., 2012.
Global level of hunger

29 countries have “alarming”/“extremely alarming” levels of hunger (2009 GHI)

GHI components:
• Proportion of undernourished
• Prevalence of underweight in children
• Under-five mortality rate

Space Applications on the Environment

Global land cover _ 2009

Source: ESA 2009 - 2011 data
Surface Model

Biophysical Geospatial Information

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Soil type
DEM (Slope)
Drainage
Soil moisture
Vegetation cover (NDVI)
Soil temperature
Global Water Crisis

- 2/3 world’s population currently lives in areas of water scarcity for at least one month a year.

- About 500 million people live in areas where water consumption exceeds the locally renewable water resources by a factor of 2 (UN World Water Development Report 2017).
Geospatial land quality evaluation: Botswana case

Land suitability for Sorghum in (Palapye/Serowe areas) of Botswana

Source: Bolo, 2016
Atmospheric Geospatial Information

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Atmosphere

Air pollution
Temperature
Carbon (GHGs)
Humidity
Cloud cover
Wind speed

Geospatial Information
Global Satellite-Derived Map of PM2.5 Averaged Over 2001-2006

Aaron van Donkelaar et. al, 2010; Evans et al, 2012
(http://www.nasa.gov/topics/earth/features/health-sapping.html)
Conclusion

✓ Space provide precise geospatial information for Sustainable development.

✓ Space provide long term drive & solution for Sustainable Development Goals.
Space Science & SDG 4

✓ Space curriculum at primary level is important.

✓ Educate women & girls.

✓ Educate regions with high rate of population growth.
Recommendations

To increase the use of Space technology for Sustainable Development;

- Space researchers must be encouraged to do researches that address the need of nations and the SDGs

- Develop space applications frameworks for SDGs

- Educate girls and women into space and empower them. Women represent over half the world population (UNESCO Institute for Statistics, 2012)

- Reduce Gender gap, women make up 28% of scientific researchers worldwide (UNESCO Institute for Statistics (UIS))
Recommendations

To increase awareness about on-going Space activities;

✓ Engage all countries by including them in Space outreach for the SDGs.

✓ Host conferences and meetings in those countries without Space centers to inspire them.

✓ Form Regional Space Committee to collaborate on Space sector and the SDGs issues.

✓ Involve everybody into space and talk more about space.
Thank You!