Setting the Scene: Space for Agriculture and opportunities for developing countries

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815 million people are hungry
Every third person is malnourished
Food system is out of balance.

Improvements in agricultural productivity comes with social and environmental cost
- water scarcity
- soil degradation
- ecosystem stress
- biodiversity loss
- decreasing fish stocks
- diminishing forest cover,
- high levels of greenhouse gas emissions
Afghanistan: Agriculture is scarce resource (only 12% of which 5% is irrigated)
SDG 2: ZERO HUNGER
End hunger, achieve food security and improved nutrition and promote sustainable agriculture

The food and agriculture sector offers key solutions for development, and is central for hunger and poverty eradication.

Sustainable agriculture is an urgent need
Data/Information play critical role
Magnitude of data needed to achieve SDGs

17 Goals
169 targets

~232 statistical indicators to be produced by every country to benchmark progress towards SDGs

Universality  Integration  Transformation
Trustworthy data will transform the world

Reliable and timely and granular data is needed for achieving and monitoring targets of SDGs
Earth observation as a source of data

- Role of Earth observation and geospatial data is recognised in supporting the achievement of the SDGs by UN (UN resolution 70/1)

- Europe case: 65 of 169 indicators directly benefit from European GNSS and Copernicus applications – either helping monitor the status of the SDGs or actively contributing to its fulfilment
UNOOSA Publication
Supporting the Sustainable Development Goals: Building blocks towards the 2030 agenda

• In January 2018, UNOOSA and European GNSS Agency (GSA) published a report that investigates the role of space technologies in fulfillment of SDGs.

• Research found that 65 of the 169 SDG targets (almost 40%) are reliant on Copernicus and EGNSS space systems.

• This report is supported by 38 cases and best practices exemplifying how space technologies contribute to achieving the SDGs.

• If these practices were implemented on a larger scale, they would contribute to the achievement of SDG targets ahead of their deadlines.

Earth observation
50 years of accumulated knowledge of earth systems, including atmosphere, land, oceans and ice coverage
- Agricultural research and development
- Biodiversity
- Desertification
- Drought
- Floods
- Fisheries and aquaculture
- Irrigation and water
- Land-use mapping
- Managing, mitigating
- Preparing for disasters
- Monitoring agricultural production
- Vegetation fires
- Weather monitoring and forecasting

**Case 1: Sustaining sugarcane belt in India**

- Canal irrigation supports sugarcane farming
- Government collects tax towards irrigation
- A revenue is used for maintenance of irrigation infrastructure to sustain sugarcane farming

**Challenge:**
Remote sensing, integrated with geospatial information offered the effective solution to monitor water tax collection.
Case II: Opium farming in Afghanistan
Opium mapping

Satellite Imagery

Field Picture with GPS camera

Helicopter Picture
Estimate

Opium acreage
Opium yield
Opium price
Opium eradication
Conversion to heroin
Trafficking
Illicit GDP

Alternate livelihood
Integrated Drought Risk Management (IDRM) Framework

Monitoring & Forecasting / Early warning
- Understanding drought risk for planning;
- Indices/indicators linked to impacts and action triggers;
- Feeds into the development/delivery of information and DSS

Vulnerability & impact assessment
- Identifies who and what is at risks and why?
- Involves monitoring/archiving of impacts to improve drought characterization
- Coping capacity of the communities

Mitigation & response planning and contingency measures
- Pre-drought program and actions to reduce risks (short and long-term);
- Operational drought contingency plans during drought disasters;
- Safety net and social program, research and extension

Three pillars of drought risks management
- Meteorological, Hydrological, and Agricultural Droughts
- Drought bulletin
- Drought vulnerability
- Impact evaluation
- Risk transfer using index insurance
- Drought declaration
- Support national policies
United Nations Office for Outer Space Affairs (UNOOSA)

**Vision**
Bringing the benefits of space to humankind

**Mission Statement**
Promote international cooperation in the peaceful uses of outer space to achieve sustainable development goals

Image credit: Digital Globe/Maxar Technologies
UNOOSA and the SDGs

Space is a cross-cutting technology, contributing in one way or another to the achievement of all 17 SDGs.
Regional Centres for Space Science and Technology Education (affiliated to the United Nations)

Post graduate diploma and master courses in
- Remote Sensing and GIS
- Satellite communication
- Satellite navigation
- Satellite meteorology
- Space law

Short course on specific themes

Remote sensing courses offers specialization in
- Agriculture and soil science
- Water resources
UN-SPIDER
United Nations Platform for Space based Information for Disaster Management and Emergency Response

- Technical advisory support
- Knowledge management
- Capacity building
- Fostering cooperation

Training programmes on drought monitoring and agricultural damage assessment
www.space4water.org

A platform for interdisciplinary knowledge exchange on space solutions and technologies for water-related topics

An initiative to make information in the field discoverable and comparable
Space integrated with other technologies powers Sustainable Agriculture and Precision Farming

Advance sensors

AI applications

Geo-intelligence
THANK YOU

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