

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

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Solutions for Sustainable Agriculture and Precision Farming

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TRANSFORMING FOOD AND AGRICULTURE TO ACHIEVE THE SDGs

**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



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.

2 ZERO HUNGER



**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



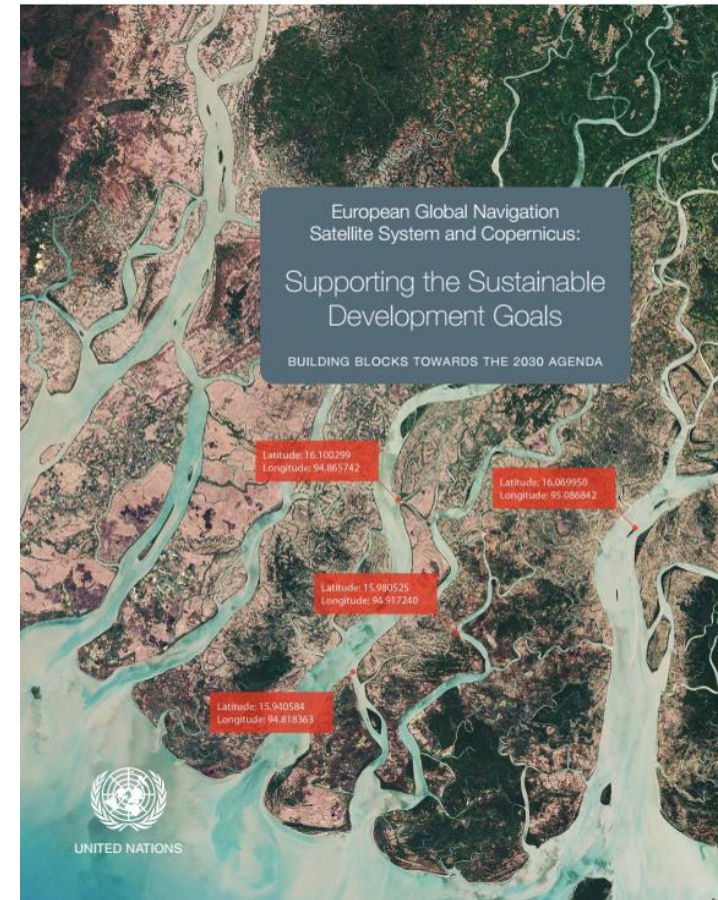
- Role of Earth observation and geospatial data is recognised in supporting the achievement of the SDGs by UN (UN resolution 70/1)
- Europe case:
65 of 169 indicators directly benefit from European GNSS and Copernicus applications – either helping monitor the status of the SDGs or actively contributing 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**



http://www.unoosa.org/res/oosadoc/data/documents/2018/stspace/stspace71_0_html/stspace_71E.pdf



Earth observation

*50 years of accumulated
knowledge of earth systems,
including atmosphere, land,
oceans and ice coverage*





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Space for Agriculture Development and Food Security

Use of Space Technology within
the United Nations System

CONTENTS



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- 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

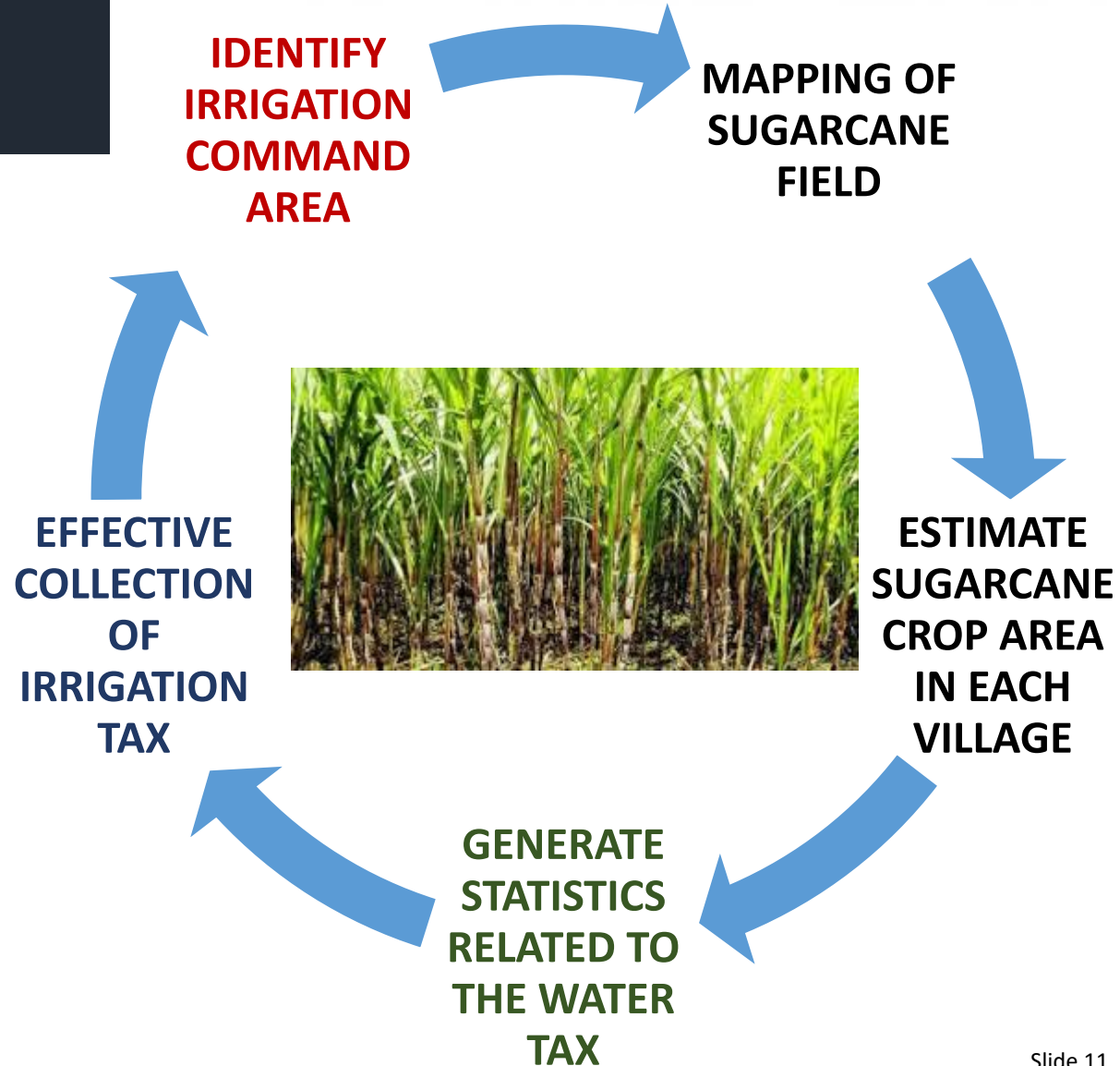
<http://www.unoosa.org/oosa/en/benefits-of-space/agriculture.html>



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

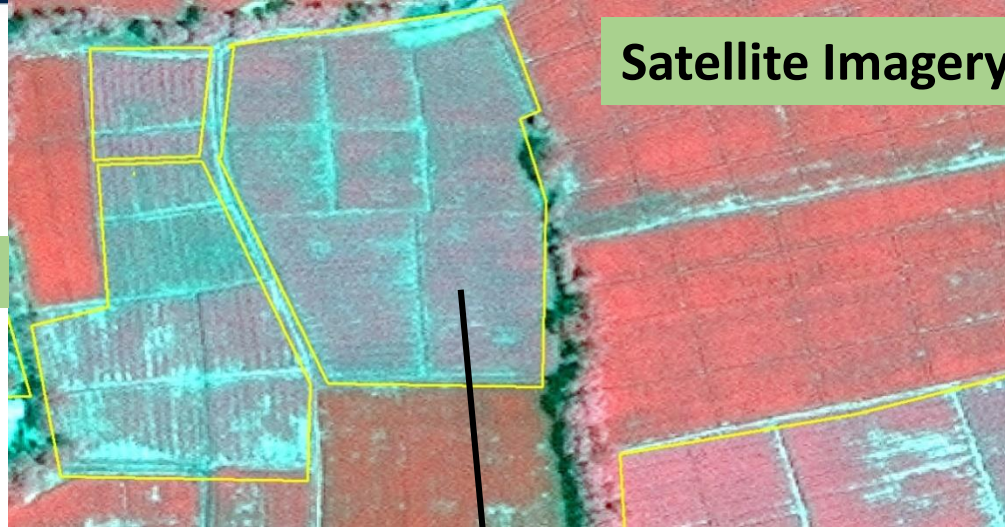


Opium mapping

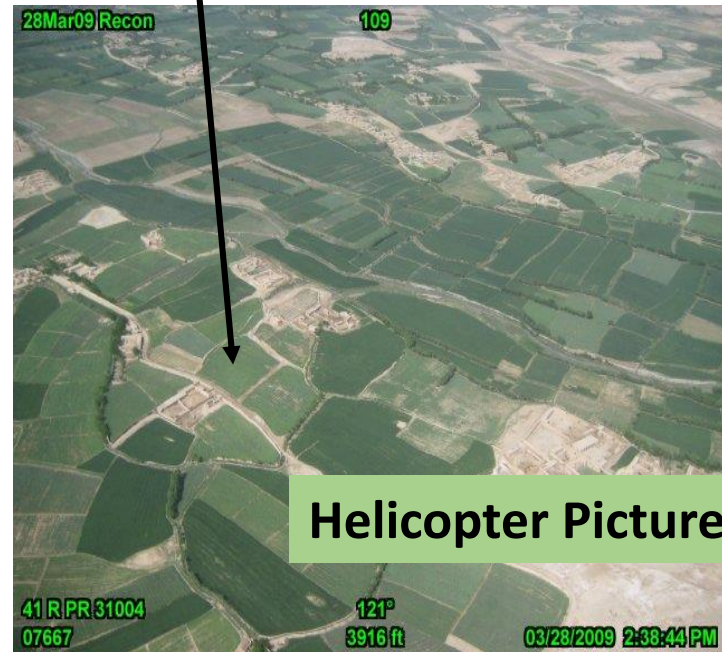


Field Picture with GPS camera

15/06/13 11:33:20 AM (+4.5 hrs) Dir=NW Lat=34.43366 Lon=69.667 Alt=7013ft MSL WGS-84



Satellite Imagery



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

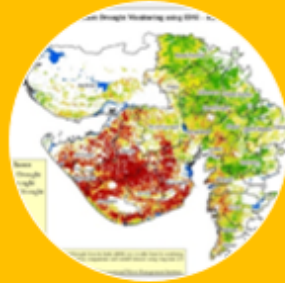


Regional Support Office of



United Nations Platform for Space-based Information for Disaster Management and Emergency Response

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





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UNOOSA and the SDGs

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Space for Women



Access to space Initiative



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Space for Water



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UN-SPIDER

www.un-spider.org



International Committee on
Global Navigation Satellite Systems

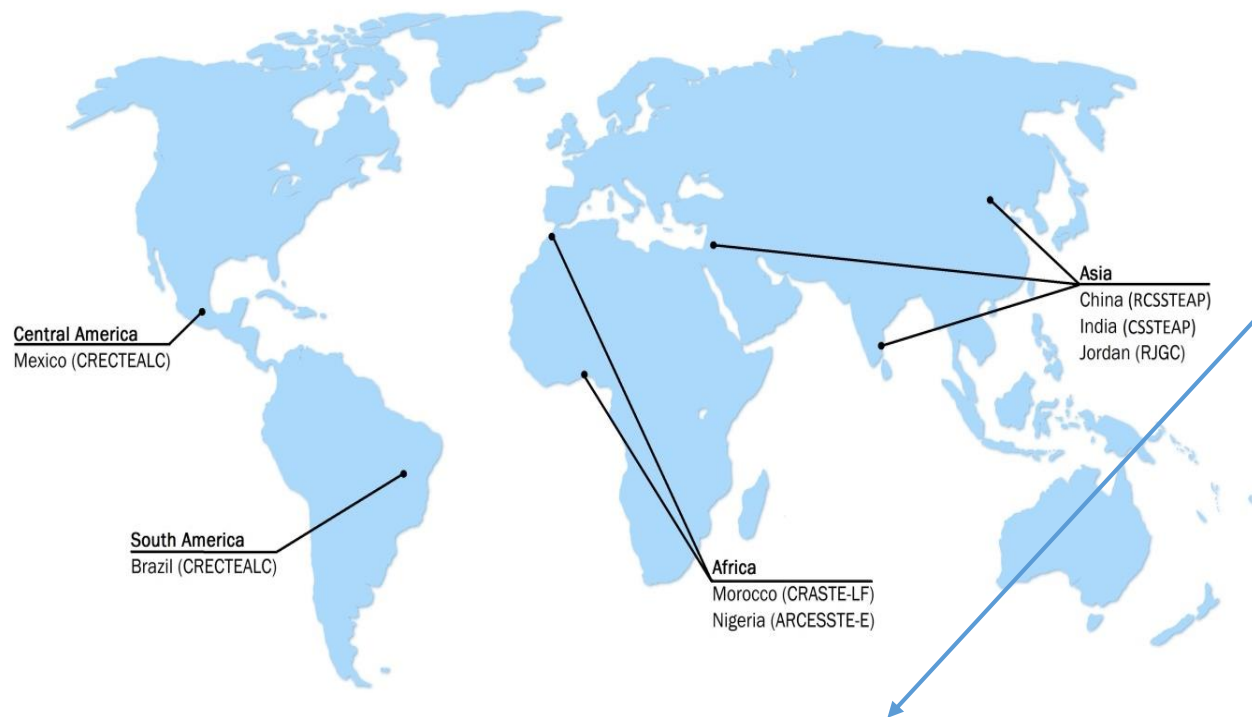
Space is a **cross-cutting technology**, contributing in one way or another to the achievement of **all 17 SDGs**



SUSTAINABLE DEVELOPMENT GOALS



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





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Prince Sultan Bin Abdulaziz
International Prize for Water

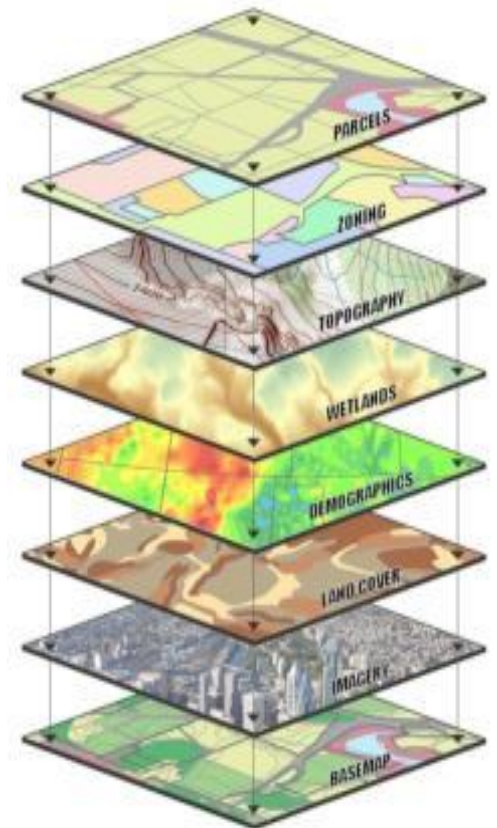
www.space4water.org

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

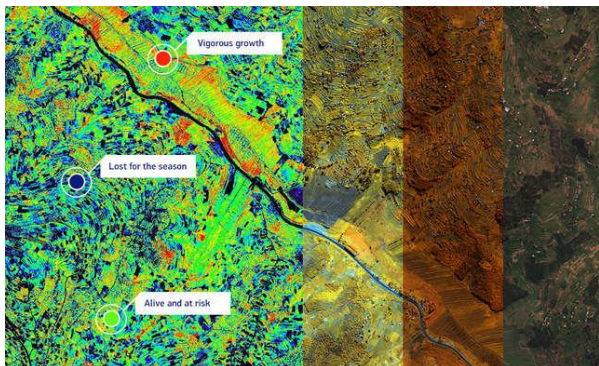
An initiative to make information in the field discoverable and comparable



Space integrated with other technologies powers **Sustainable Agriculture and Precision Farming**



Advance sensors



AI applications

Geo-intelligence

THANK YOU

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