→ EARTH OBSERVATION FOR SUSTAINABLE DEVELOPMENT

Agriculture and Rural Development

Geospatial World Forum Workshop
3 April 2019| Amsterdam, the Netherlands

Session 1 - Benefits of EO for agricultural development

EO4SD consortium, presented by Raul Zurita-Milla, Faculty ITC – University of Twente

agriculture and rural development
eo4sd

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Workshop structure

Goal: to inform and build awareness among agricultural specialists on the utility, benefits, and potential constraints of using satellite Earth Observation (EO) information services.

Session 1: Introduction

Session 2: Design phase

Session 3: Operations

Session 4: Impact evaluation

http://eohandbook.com/sdg/

Earth Observation for Sustainable Development (EO4SD)

An ESA initiative fostering the uptake of satellite-based environmental information

esa
European Space Agency

eo4sd
earth observation for sustainable development

agriculture and rural development
eo4sd

urban development
eo4sd

climate resilience
eo4sd

water resources management
eo4sd

disaster risk reduction
eo4sd

marine resources
eo4sd

eastern european region
eo4sd

conflict, fragility and resilience
eo4sd

The consortium of EO4SD – Agriculture and Rural Development

SERVICE PROVISION

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AUSTRIA

DATA INTEGRATION

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CAPACITY DEVELOPMENT

UNIVERSITY OF TWENTE.

ITC
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COMMUNICATION

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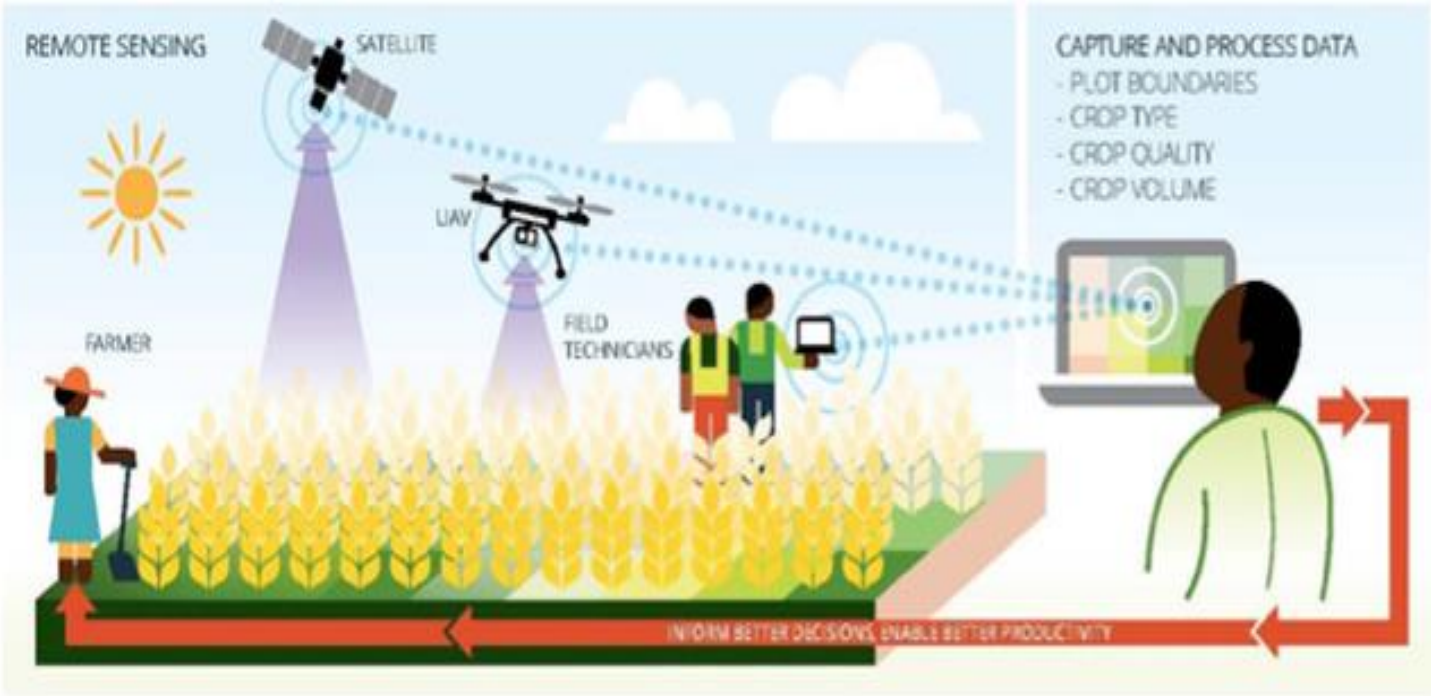
BELGIUM

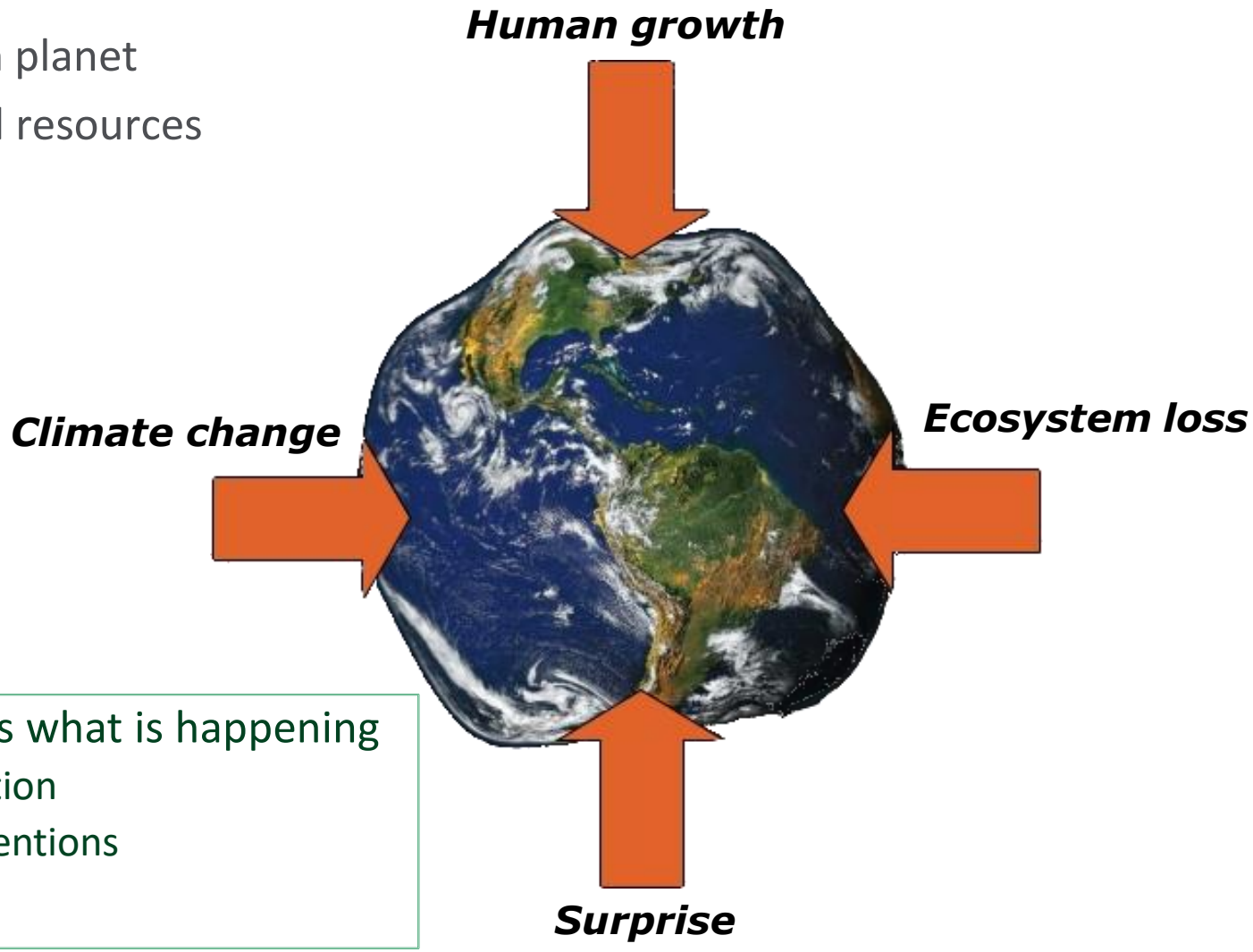
Earth observation / remote sensing

"…is the science (and, to some extent, art) of acquiring information about the Earth's surface without actually being in contact with it.



Remote sensing: a tool to study the environment

- Large pressures on planet
- Changes to natural resources



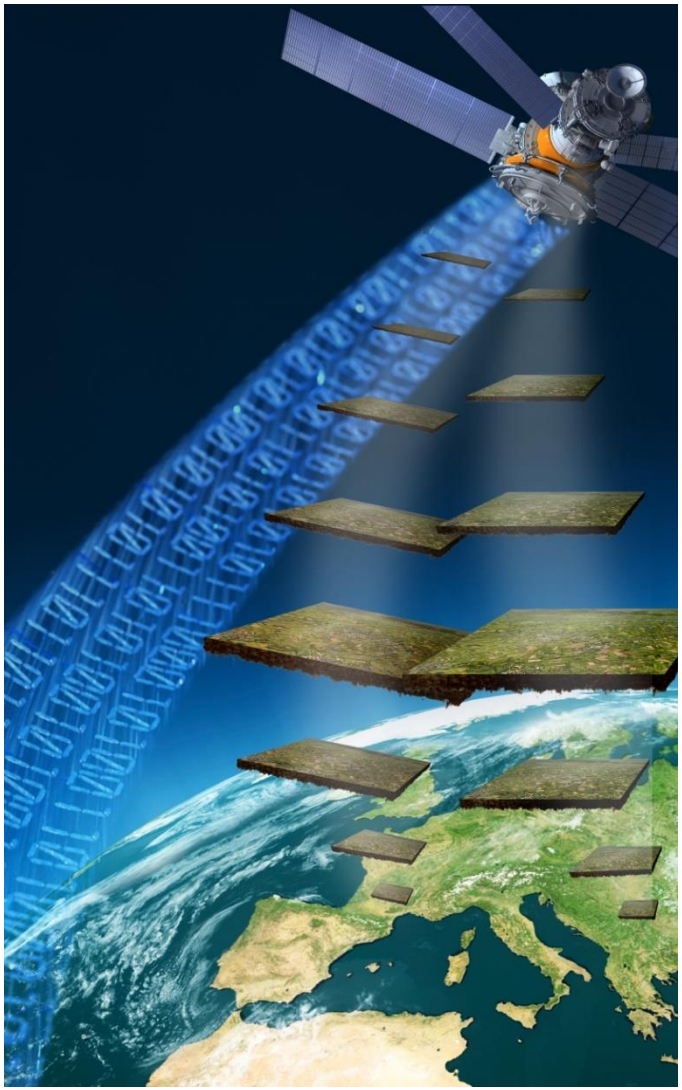
- Know for large areas what is happening
  - Agricultural production
  - Effectiveness interventions
  - …

Rockström & Karlberg, 2010. *Ambio 39*: 257-265

Role of Earth Observation in the context of agriculture

Agricultural production ⟷ **Access to information**

- Continuous unbiased source of information
- Wide range of spatial and temporal scales
- Historical and actual global information
- Monitor the baseline, status and trends
- Input for tooling / applications



Momentum in the context of the Sustainable Development Goals

Goal 2
End hunger, achieve food security and improved nutrition and promote sustainable agriculture

target 2.4 Increasing agricultural productivity

Sustainable use of **land** and **water** resources

target 15.3
Combat desertification and achieve a land degradation neutral world

target 6.4
Substantially increase water use efficiency

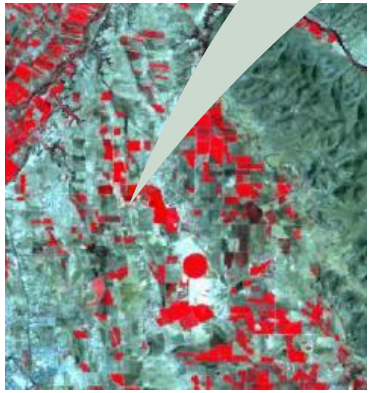
target 17.18
Increase the availability of high-quality, timely, and reliable data

EO tooling and datasets

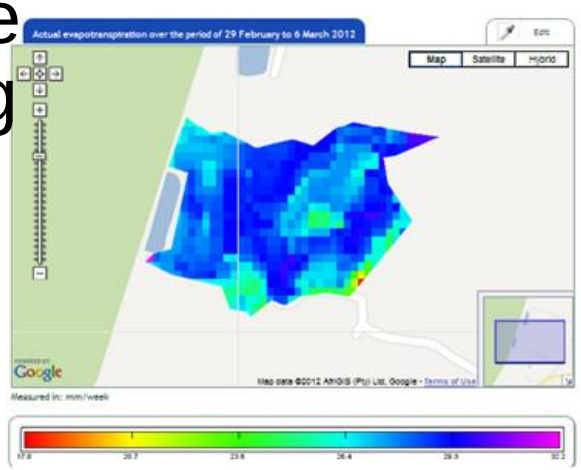
Instructiv
e tools

Intelligent
pixels

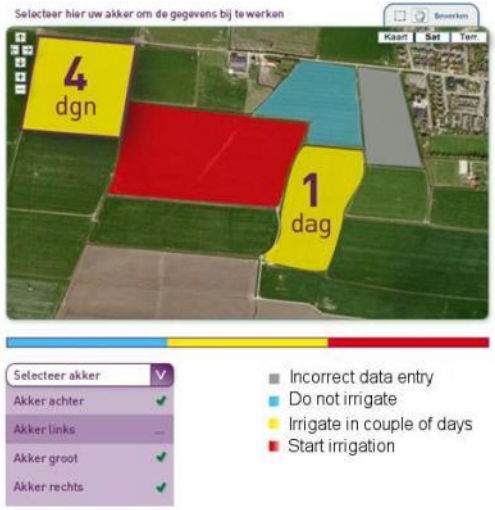
Remote
sensing
data



e.g. Sentinel

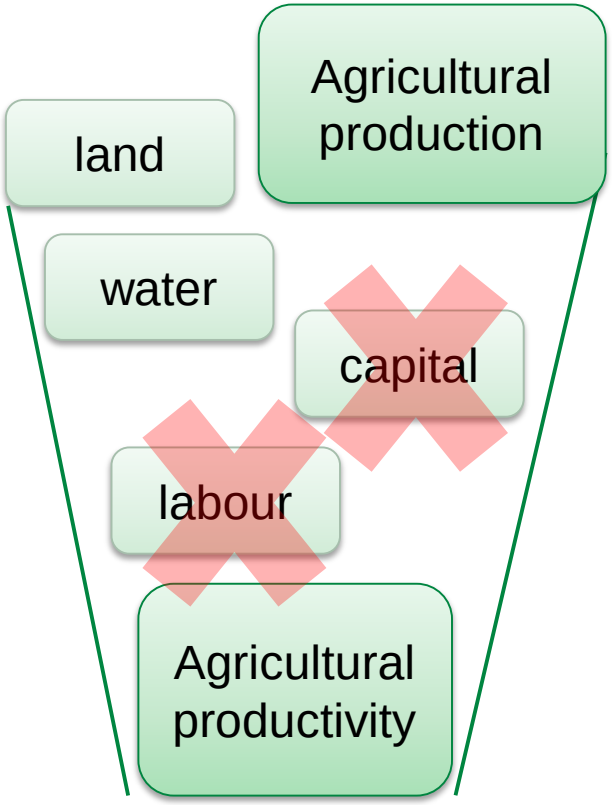


e.g. Crop water requirement



e.g. Irrigation advice

Observations from space have their limitations:



Green houses

Land ownership

Ground truth

Clouds

For successful M&E

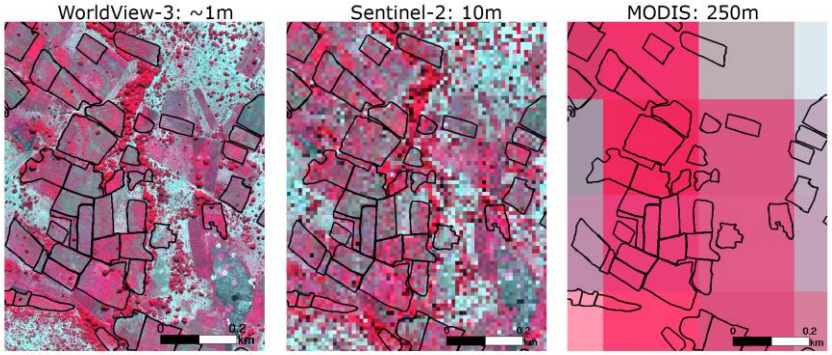
you need geospatial data of intervention areas

And: complexity in the field (small plots, intercropping) = difficulties for Earth Observation

Some considerations when selecting data

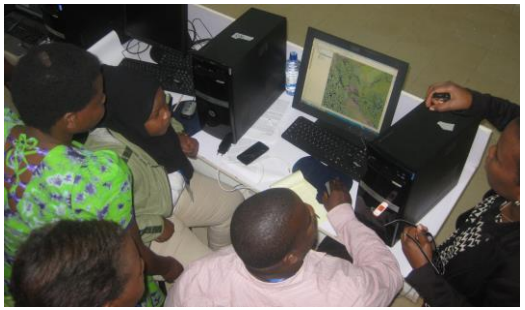
- What is the area of interest? – spatial coverage
- How much detail do we need? – spatial resolution
- How often do we need an update? – temporal resolution
- For which period do we need the data? – temporal coverage
- What is our budget? – Financial constraints

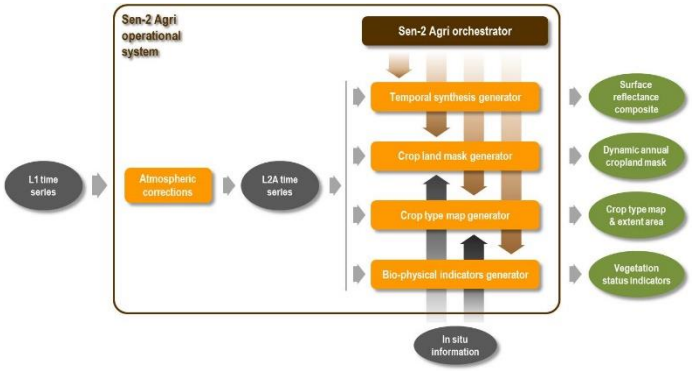
What is the information needed?
What can be observed to fulfil that need?

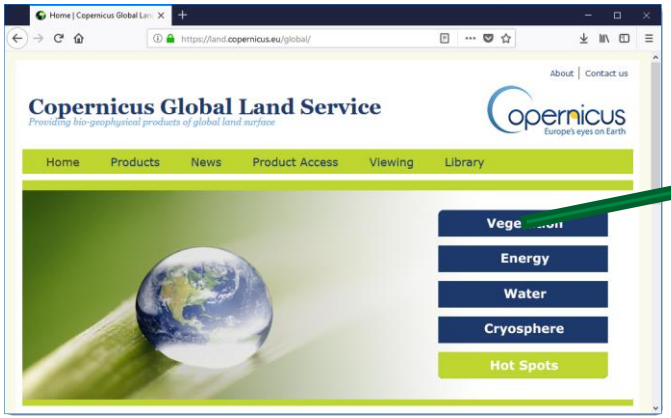


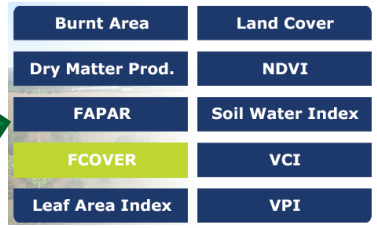
How to obtain information?

- **Do it yourself**
  - Specialized software
  - Online options *(e.g., Google Earth Engine)*
  - Existing tools *(e.g., Sen2Agri)*
  - Expertise needed
    - Capacity building
- **Use free, existing products**
  - Raw images
  - Processed products (e.g. surface reflectance)
  - Higher-level products
  - Do they suit needs?
- **Get experts on board**
  - No need for processing facilities
  - No need for image interpretation
  - Direct access to required information
  - Comes at a cost









Themes

1. Monitoring **agricultural production**
2. M&E of **land degradation**
3. Agricultural **commodities** production's impact assessment
4. **Ecosystem services** provided by agriculture
5. Planning and monitoring of **rural infrastructure** investments
6. **Food security** and agriculture risk management
7. Support environmental and social **safeguards** frameworks
8. **Irrigation** systems development and management

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Thank you

https://www.eo4idi.eu/news