Increasing uptake of satellite earth observation data and services in the agricultural development community

EO4SD Project Consortium, presented by Remco Dost
Setting the stage: world food production

Farmers need to produce 70% more food by 2050.

- Irrigation: 33%
- Rainfed: 56%
- Livestock: 11%

Food production (%)

- Usable: 23%
- Too wet: 20%
- Too steep: 20%
- Too dry: 20%
- Too cold: 20%

Land reserve (%)

Area (million ha)

1270
260
2300

J. Deckers - kuleuven
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
Role of Earth Observation

- 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
Earth Observation contributes to Monitoring & Evaluation

- **Accountability**
  (ie. monitoring land degradation, productivity)

- **Operational management**
  (ie. quantifying trends to improve performance)

- **Strategic management**
  (ie. evaluating project impact)

- **Capacity building**
  (ie. provide tooling to boost capacity and self reliance)
Supporting project/programme success with Earth observation

EO PRODUCT

- Land cover/use
- Cultivated area
- Vegetation dynamics
- Biomass production

KEY INDICATORS (biophysical)

- Forest area
- Surface water bodies
- Forage resources
- Grazing lands
- Land productivity

APPLICATIONS

- Assess status, trends, change and strategies in agriculture
- Evaluate the impact of interventions
- Safeguards

KEY QUESTIONS addressed

Trends, changes and strategies in
- Land degradation
- Agricultural production
- Water consumption

Evaluate
- Increase in agricultural productivity
- Sustainable land management
- Deforestation related to agriculture

Impact on environment
- Environmental sustainability
- Resilience in agriculture
- Impact of climate
Strategy: Niger - provincial water productivity census

Actual evapotranspiration
(mm/dry season)

Biomass production
(tons/ha/dry season)

Biomass water productivity
(kg/m$^3$ in dry season)
Water Productivity Open-access portal
wapor.apps.fao.org

Continued access because supported by FAO: manual available
Requests for additional higher resolution data pockets possible via FAO
Planning: Ghana - Irrigation dashboard

Potential water saving: 7 million m³ (5%), increase in revenue 350,000 Euro (90 Euro / hectare), not calculating energy savings – annually
Operations: Niger - irrigation dashboard

- Cloud solution
- On-farm/off-farm water management
- Irrigation advice
- Yield prognosis
- Safe water / energy, quantify savings in water, energy and $$$
Operations: Sudan - Irrigation service personalised message

Regional scale data

• Farmer support:
  – Irrigation advice
  – Agronomic support
  – Insurance
  – Weather information
  – (access to) Market information

Local scale agronomic tips

Increase production
Average 60%!
The SLMP-2 project started with rehabilitation measures of degraded land in this watershed in 2012.

How is the vegetation productivity before and after interventions?
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
- Timely, high quality, unbiased, repeatable, cost efficient
- Local and international consultants
Challenges: what is required to embrace EO solutions?

EO community: translate data into information

- **Simple answers in a complex world** – Manipulate big data into “small data” in a transparent, trustworthy and understandable manner.

- **Dealing with a dynamic environment** – Agricultural performance depends on many factors including weather and market prices. What results are related to the project, and what to external factors?

Development community: set up a development data ecosystem

- **Standardization** – Crucial for upscaling of tools and technologies and comparison between projects.

- **Financial resources** – Ensure (funds for) data and information are available.

- **On-the-ground data** – Link geospatial data to the project.

- **Institutional capacity** – Users may ask for information they are familiar with, unaware of alternative technical options. We need to engineer the demand.
Thank you

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