Session 2 - Design phase

EO4SD consortium, presented by Evelyn Aparicio Medrano, Nelen & Schuurmans
Why using satellite data for the project design phase?

Saving of costs and time
- Base layer for targeted field inspections
- Quick first analysis

Quality improvement
- Improved visualisation of phenomena/better insight in actual situation
- Increased amount of data for analysis
- Integration of different layers of information
- Better insight into cause-effect relations (add spatial dimension)
- Support for informed decision-making and planning

Improved process control
- Earlier identification of threads and potential risks
- Coverage of unsafe and/or inaccessible areas
Supporting project design with Earth observation

EO PRODUCT
- Land cover and use
- Drought and flood occurrence
- Infrastructure
- Weather data

KEY INDICATORS (biophysical)
- Habitat mapping
- Land and irrigation suitability
- Soil erosion risk
- Extreme events

APPLICATIONS
- Strategy definition
- Project area identification
- Project preparation

KEY QUESTIONS addressed

Identify risks and opportunities:
- Frequencies and location of floods and droughts (communities affected)
- Where to introduce irrigation

Identify project focus:
- Major factors limiting productivity
- Identify areas in need of intervention

Know the intervention area:
- Most suitable crops
- Opportunities for irrigation
The intervention area at a glimpse.
Customized land cover map 2016, Angolelana Tera, Ethiopia at 10m spatial resolution.

How is the land cover and agricultural area in the intervention area distributed?

Where should activities be focussed?

How did this change over the course of the project?

ESA CCI free prototype land cover map at 20m for Africa
EO4SD customized detailed land cover map at 10m

www.landmonitoring.earth
Going from Land cover to Habitat quality
Modelling habitat quality with InVEST based on refined ESA CCI Land cover. Santa Cruz, Bolivia.
Going from Habitat quality to site utilization suitability
Santa Cruz, Bolivia.

<table>
<thead>
<tr>
<th>Site Utilisation Suitability</th>
<th>Area [ha]</th>
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</thead>
<tbody>
<tr>
<td>high suitability</td>
<td></td>
</tr>
<tr>
<td>medium to high suitability</td>
<td></td>
</tr>
<tr>
<td>low to medium suitability</td>
<td></td>
</tr>
<tr>
<td>low suitability</td>
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Where can new development take place with the least impact on the environment?
Suitability mapping - Irrigation

(1) Environmental constraints | (2) Suitability for irrigation types | (3) Crop requirements

(1) Constraints
Agricultural restrictions:
- steep slopes
- riverine corridors
- protected and urban areas
- degraded land
- unsuitable soils

(2) Irrigation type
Flood, sprinkler, drip

(3) Crop type
Determine suitability for crop types

<table>
<thead>
<tr>
<th>Crop class</th>
<th>$T_{\text{min}}$ (°C)</th>
<th>$T_{\text{max}}$ (°C)</th>
<th>$T_{\text{mean}}$ (°C)</th>
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</thead>
<tbody>
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<td>27</td>
<td>17.4</td>
</tr>
<tr>
<td>maize</td>
<td>15</td>
<td>35</td>
<td>25.4</td>
</tr>
</tbody>
</table>

= Irrigation suitability map

potato
Suitability mapping – Planning support

- Flood risk mapping
- Distance to roads
- Land cover
- Soil erosion potential

Which area is best suited for the construction of rural infrastructure?
Identifying areas in risk – Drought & Flood

Timely information on
- predicted & actual crop production
- related factors such as crop biophysical/soil/climate characteristics
- occurrence/duration/intensity of natural disasters such as drought / flood
- Available at various scales

Quantify reductions in crop production and anticipate food shortages related to drought and flood.

Where is it extremely dry or flooded and how often?

Central Dry Zone Myanmar
Identifying areas in risk – Flood frequency

Multi-sensor approach (optical and radar) → frequent, accurate and high resolution information on flooding

Where is it flooded and how often?
agriculture and rural development
earth observation for sustainable development

Learn more about the ESA initiative

an ESA initiative to support the uptake of EO derived information in international sustainable development.
Thank you!

For more information
http://eo4sd.esa.int/agriculture
http://eo4sd.Lizard.net
Round table questions – 10 minutes

Did you ever use earth observation for designing a project?
   Yes: give 1 example how
   Now: What did hinder you/what would be needed to do so

• Would you assign a budget in a future project for using satellite-based information for project design or have you already done so?

• Is there a need for awareness creation on higher levels within the organisation or in the country in order to get EO in general recognised in the organization’s strategy? Which ones should be addressed?
Share your impressions with us!
#EO4SDAgriculture
@EO_OPEN_SCIENCE