

→ EARTH OBSERVATION FOR SUSTAINABLE DEVELOPMENT

Agriculture and Rural Development

Progress Meeting EO4SD Agriculture Cluster
4-5 October 2017 | ESRIN, Frascati, Italy

Cambodia

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Context:

- Tonle Sap Poverty Reduction and Smallholder Development Project (**TSSD**) (ADB, GAFSP, IFAD),
- Strengthening Coordination for Management of Disasters Project (**SCMD**)
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Objective:

- Assess the impact of ADB projects in terms of **improved irrigation** and **increased crop production**
- Plan for additional interventions in **infrastructure** development (roads and irrigation system)
- Focus on **performance** between districts at landscape level: examples from Prey Veng province

Approach:

- Assess (historical and current) **crop type diversification** and monitor number of **crop cycles** per year over time at the landscape level.
- Assess (historical and current) **flood risk** for infrastructural planning, productivity to see the effect of interventions, **drought** to see the effect of irrigational investments, and soil moisture to see large scale water availability patterns
- Evaluate if investments in rice cropping intensification and introduction of alternative crops have been successful using **performance**.

Stakeholders:

- Ministry of Water Resources and Meteorology (MOWRAM)
- Ministry of Agriculture, Forestry and Fisheries (MAFF)
- Ministry of Interior (NCDSS)

The stakeholders have **advanced capabilities** for data processing

Needs (requirements) include **crop cover, soil moisture, flooding** information

Stakeholders play an active role using the products for spatial decision making for **planning irrigation infrastructure** and ongoing **risk monitoring** to reduce crop damage

EO4SD engaged with all partners in Cambodia during Dec 2016 - Sep 2017

Description:

- Input data: 10-30m Sentinel-1, Sentinel-2, Landsat imagery
- Information (product/service):
 - Crop type and intensity
 - Flood Risk (water extent)
 - Agricultural water productivity
 - Drought (Etdeficit)
 - Soil Moisture Monitoring/Soil Water Index
- Dissemination channel: geotif map data for use in free QGIS software
- Feedback: positive but early stage of project development
- Critical success factor: local interaction, translation into actionable info
- Critical issues and mitigation: project timeline, matching budget

Demonstration: Landsat-8



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European Space Agency

Demonstration: Sentinel-2



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Demonstration: Landsat-8



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Demonstration: Sentinel-2

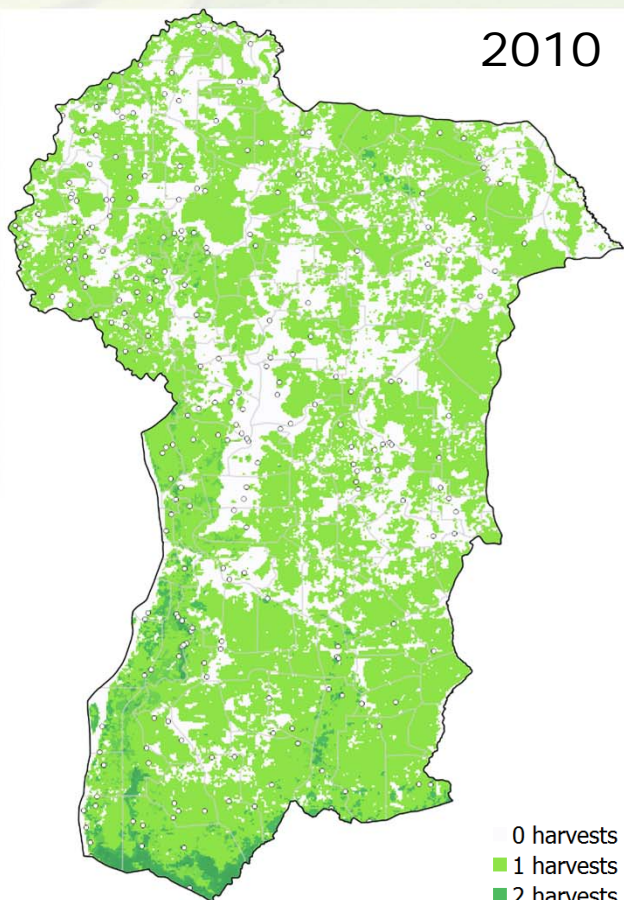


Crop diversification monitoring



Productivity crop intensity

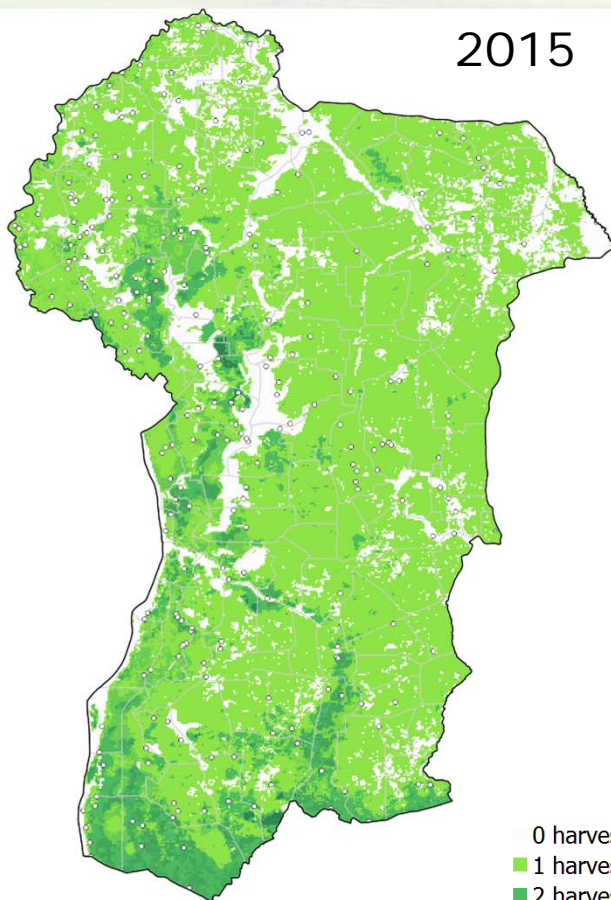
2010



- 0 harvests
- 1 harvests
- 2 harvests
- 3 harvests

Productivity crop intensity

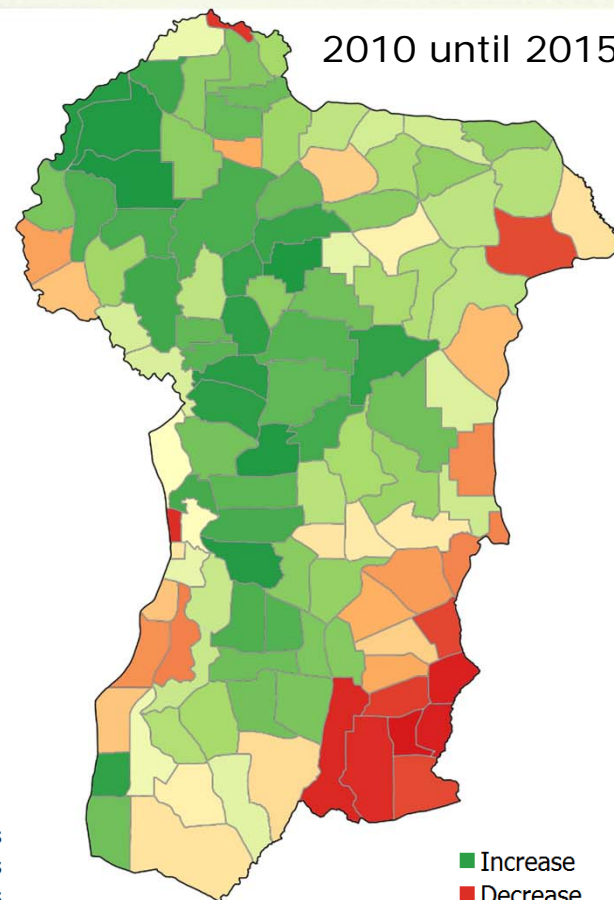
2015



- 0 harvests
- 1 harvests
- 2 harvests
- 3 harvests

Productivity crop intensity change

2010 until 2015



- Increase
- Decrease

Crop diversification monitoring



[insert Animation]

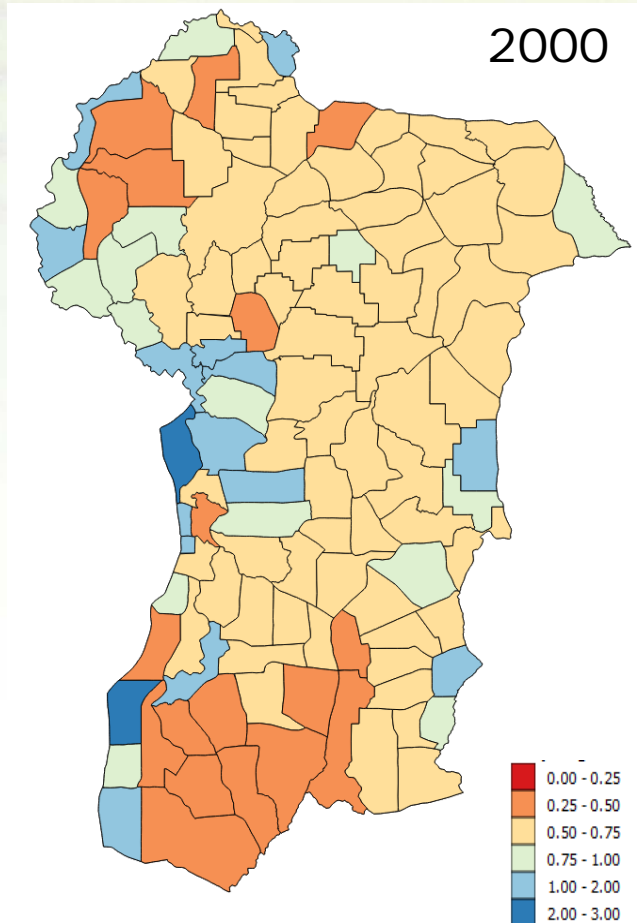
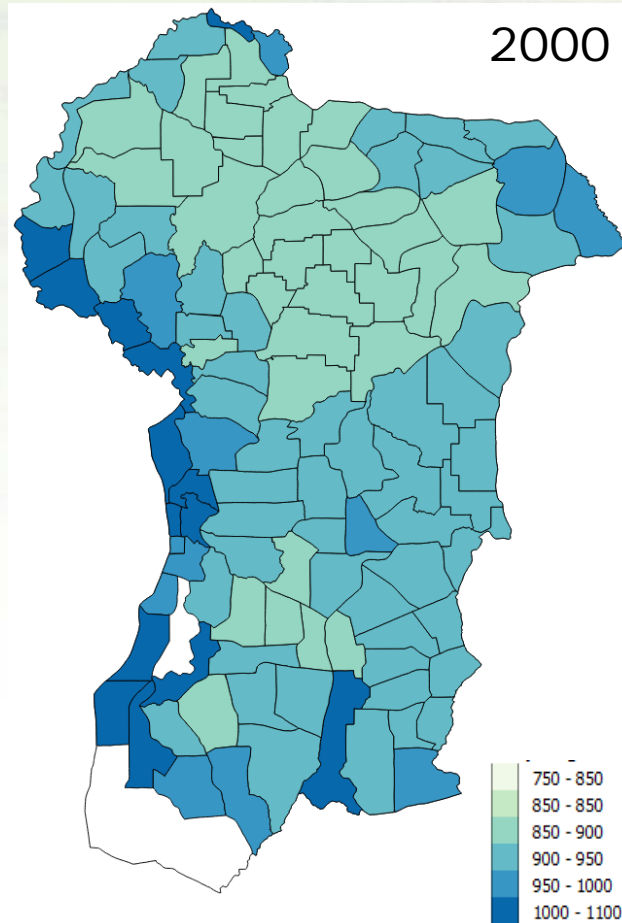
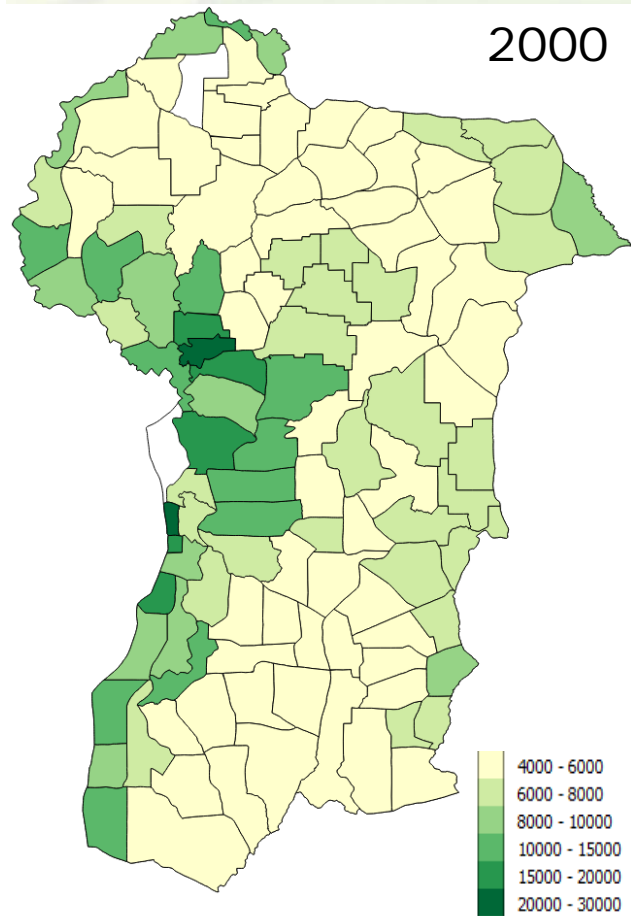
Agricultural water productivity: biomass and crop water use



Gross primary productivity in kg/ha

Water consumption (ET mm/year)

Biomass water productivity (kg/m³)



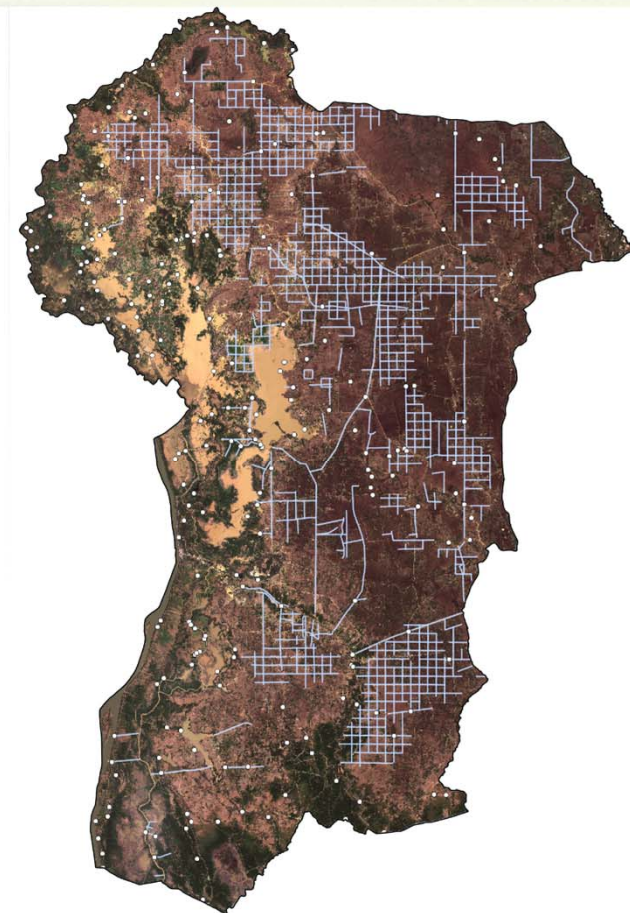
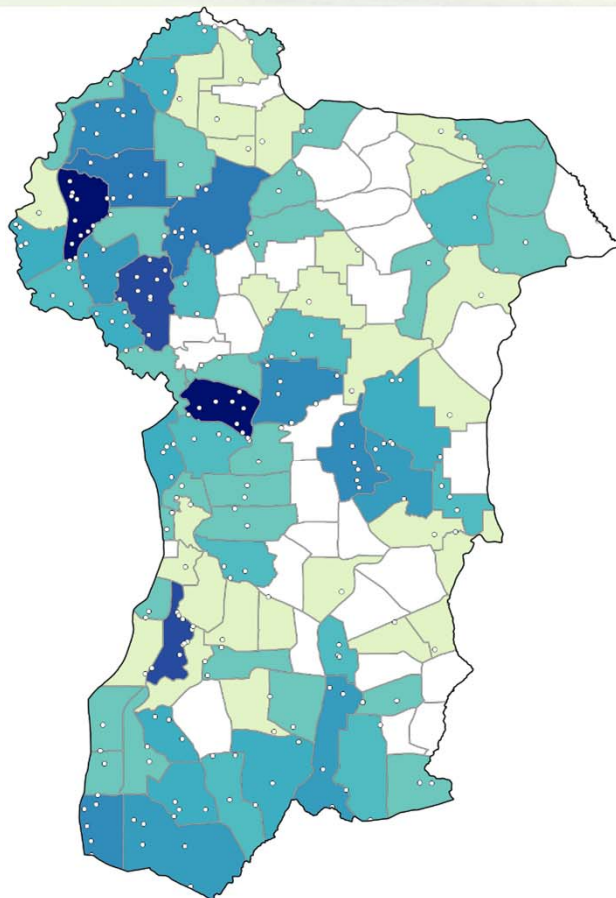
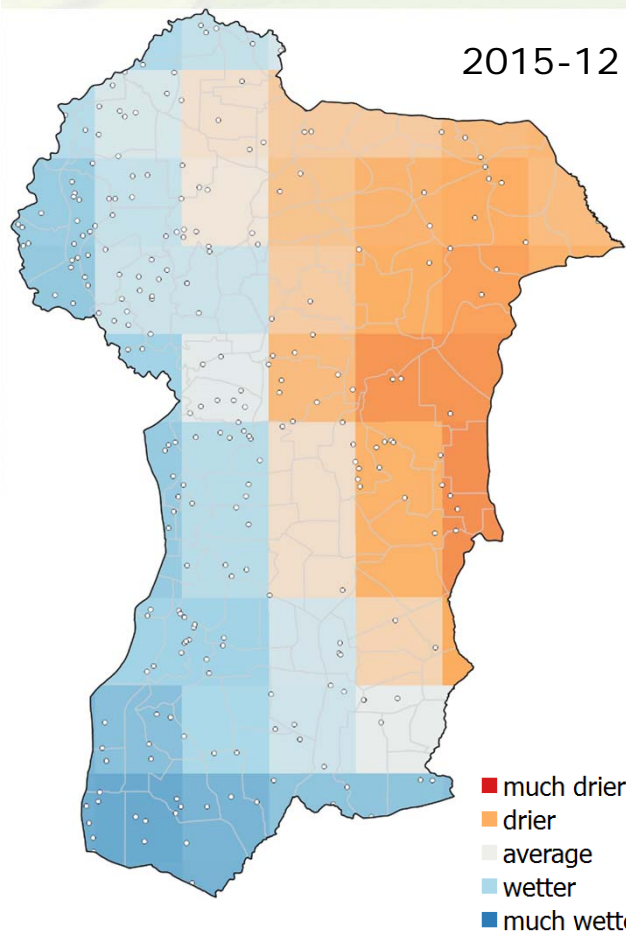
Irrigated areas monitoring



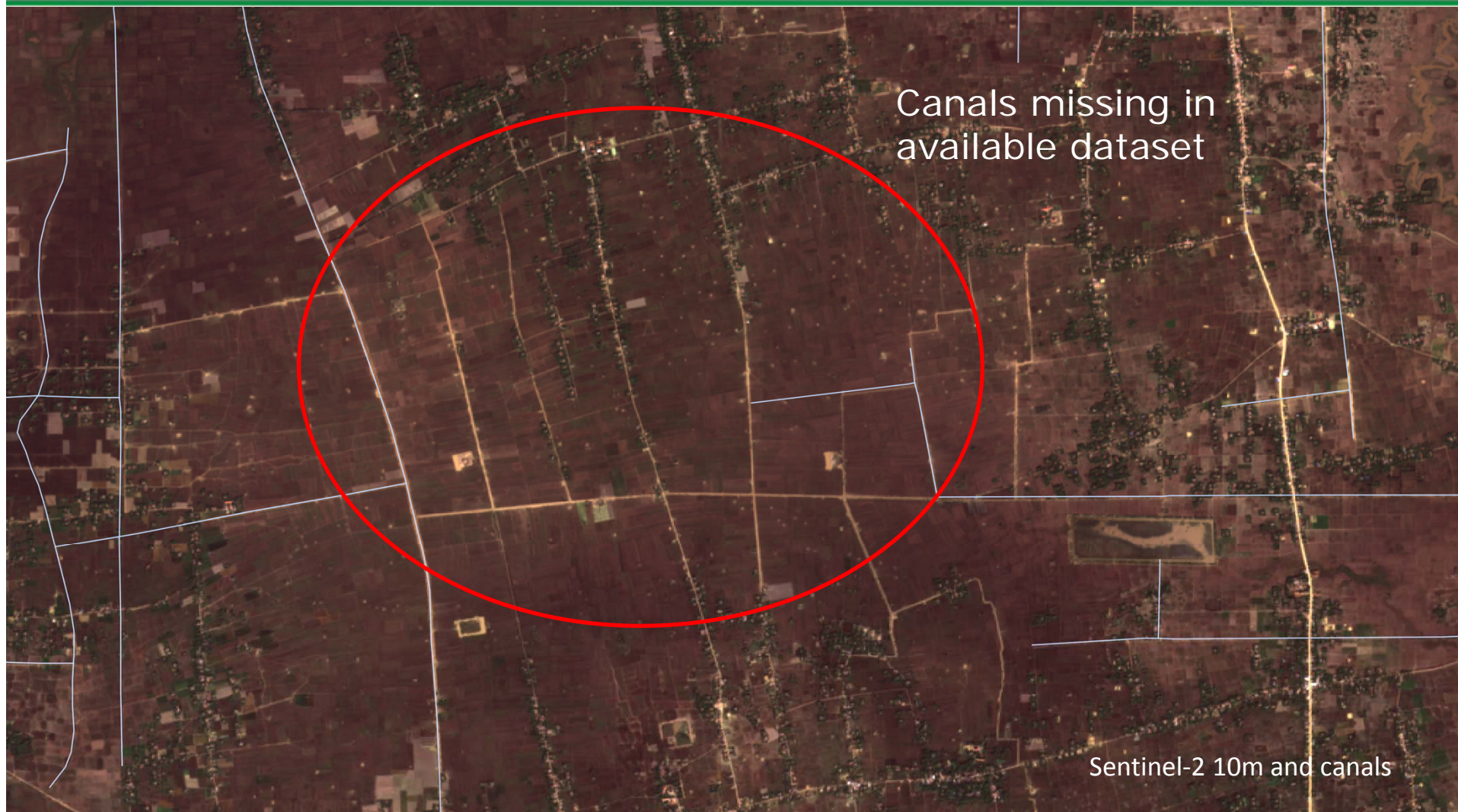
Soil Water Index anomaly

Irrigation programmes (# per district)

Sentinel-2 10m and canals



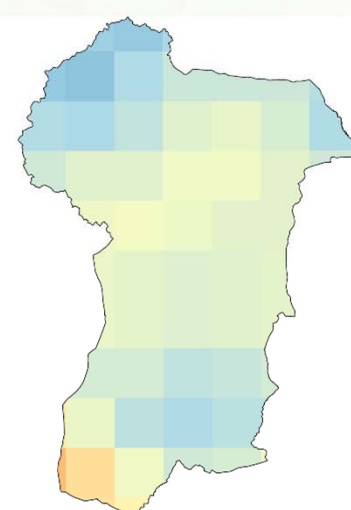
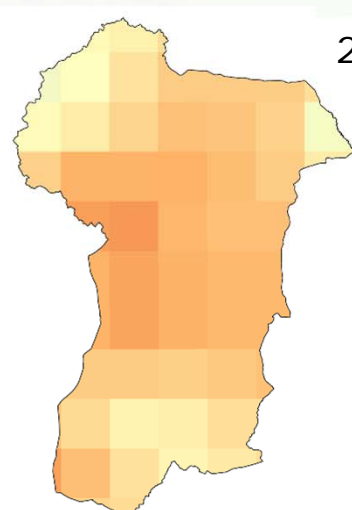
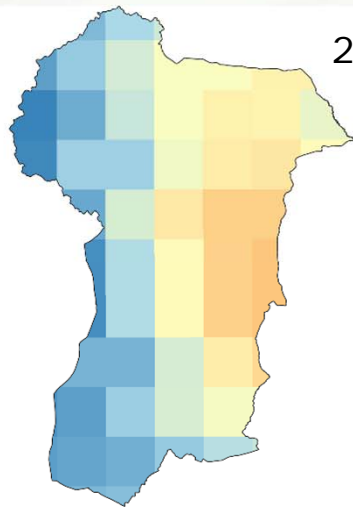
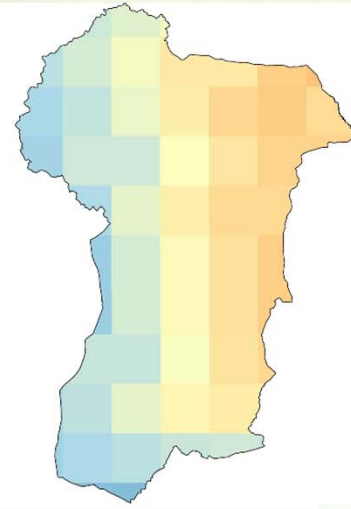
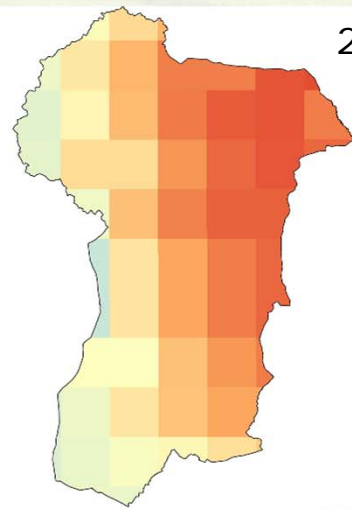
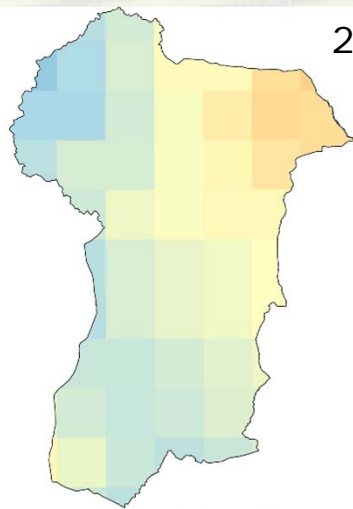
Irrigated areas monitoring



Canals missing in available dataset

Sentinel-2 10m and canals

Drought: soil moisture monitoring



2014-05

2014-07

2014-09

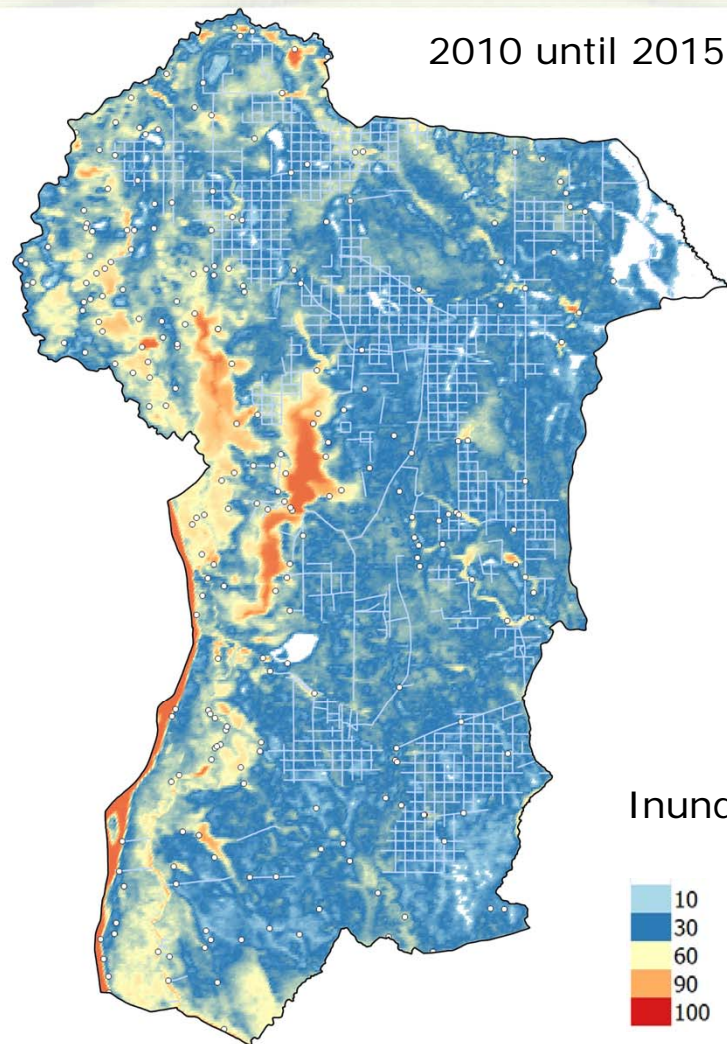
2014-11

Soil Water Index

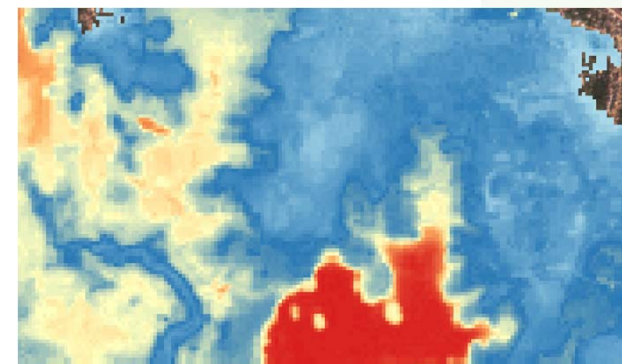
wilting level - field capacity
dry - 0% wet - 100%



Floods: inundated area monitoring

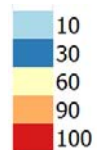


Sentinel-2 10m



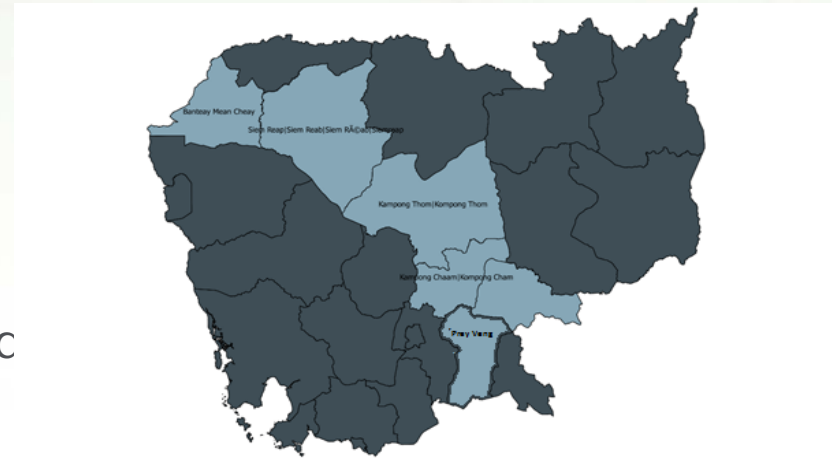
Inundation frequency close-up

Inundation frequency (in %)



Future

- Planning:
 - Operational monitoring of Prey Veng province
 - Expansion to all 6 pilot provinces selected by ADB



- Spin off: further application Camboc