Remote sensing for improved irrigation in Central Asia

Water Resources Management
KNOWLEDGE PARTNERSHIP WEEK
Partnership Forum:
Innovation for Resilient and Smart Communities

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Difficult to Assess Irrigation Performance

- Important to understand “Irrigation Performance” for Irrigation Projects
- However, no cost-effective methods to evaluate

Satellite Remote Sensing can provide solution!!

- Evapotranspiration (ET) maps = Crop Water Consumption
- Crop Cover maps.

Evapotranspiration is an important factor to evaluate irrigation system.

Satellite Remote Sensing can provide solution!!
Precipitation and ET graph around Pyanji River Basin

- Irrigation system is operated and water is supplied in dry season.
ET maps from satellite (MODIS) data

- In rain season, water is homogeneously supplied by rainfall.
- In dry season, irrigation system performs and poor/good area appear in ET maps.
Irrigation Consumptive Use Coefficient (ICUC)

ICUC (%) =

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\frac{\text{Satellite-based ET data}}{\text{Water consumptively used as ET}} \times 100
\]

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\frac{\text{Water applied as Irrigation}}{\text{Pump data and Rainfall data}}
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- ICUC = How many portion of water was consumptively used at the irrigation system level
- ICUC can be indicator for the performance of irrigation system.
- By comparing ICUC before and after irrigation projects, it’s possible to evaluate the improvement.
Crop Cover Map (Tentative version)

This cropping cover map was based on:
- a result of Landsat cluster analysis, which was provided by Prof. Moriyama, Nagasaki University and
- field information collected by interview survey.

- Useful for irrigation optimality evaluation based on crop cover
- Planning /monitoring agricultural land use.
Summary of data and advantage

- Important to understand “Irrigation Performance”
- Cost-effective method to evaluate

Satellite Remote Sensing can provide cost-effective method such as ET map
- Spatially and temporally evaluation
- Quantitative indicator, ICUC
- RESTEC tries to develop the method by using open satellite data.