



Delft-FEWS as data-integrator: analyzing water availability in Indonesia

Sistem Informasi Water Availability Main Intakes

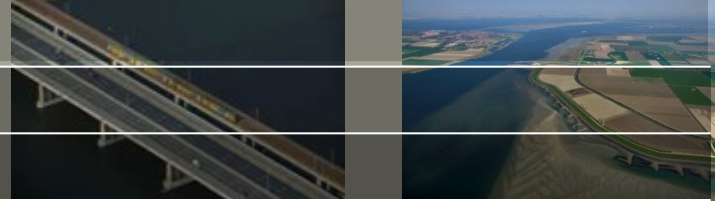
A collaboration between the Indonesian Water Resources Centre (Pusair) and Deltares

By: Daniel Tollenaar

Irfan Sudono

Klaas-Jan van Heeringen, Ifan, Herman, Neeltje & Maulina & many more

26-10-2016



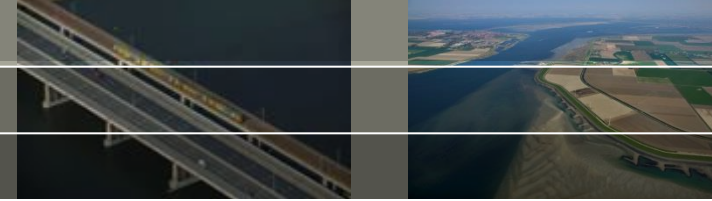
Delft-FEWS as data-integrator: Sistem Informasi Water Availability Main Intakes (SI WAMI)

Content:

- SI-WAMI objective
- System architecture
- Field data entry
- Automated Delft-FEWS
- Wflow external module
- Results & Conclusions



SI-WAMI objective



In Indonesia there is a robust regulatory framework for **irrigated agriculture**. However, the implementation of the regulatory framework is sub-optimal and fragmented (Grashoff et al 2016).

Systems are under development to transfer information on water and production between central and local governments to aid in better decision making and rehabilitation of irrigation infrastructure.

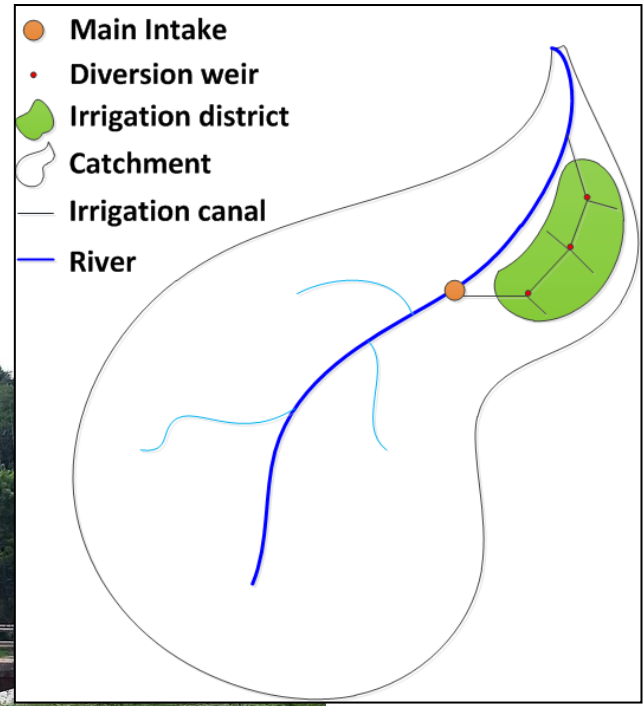
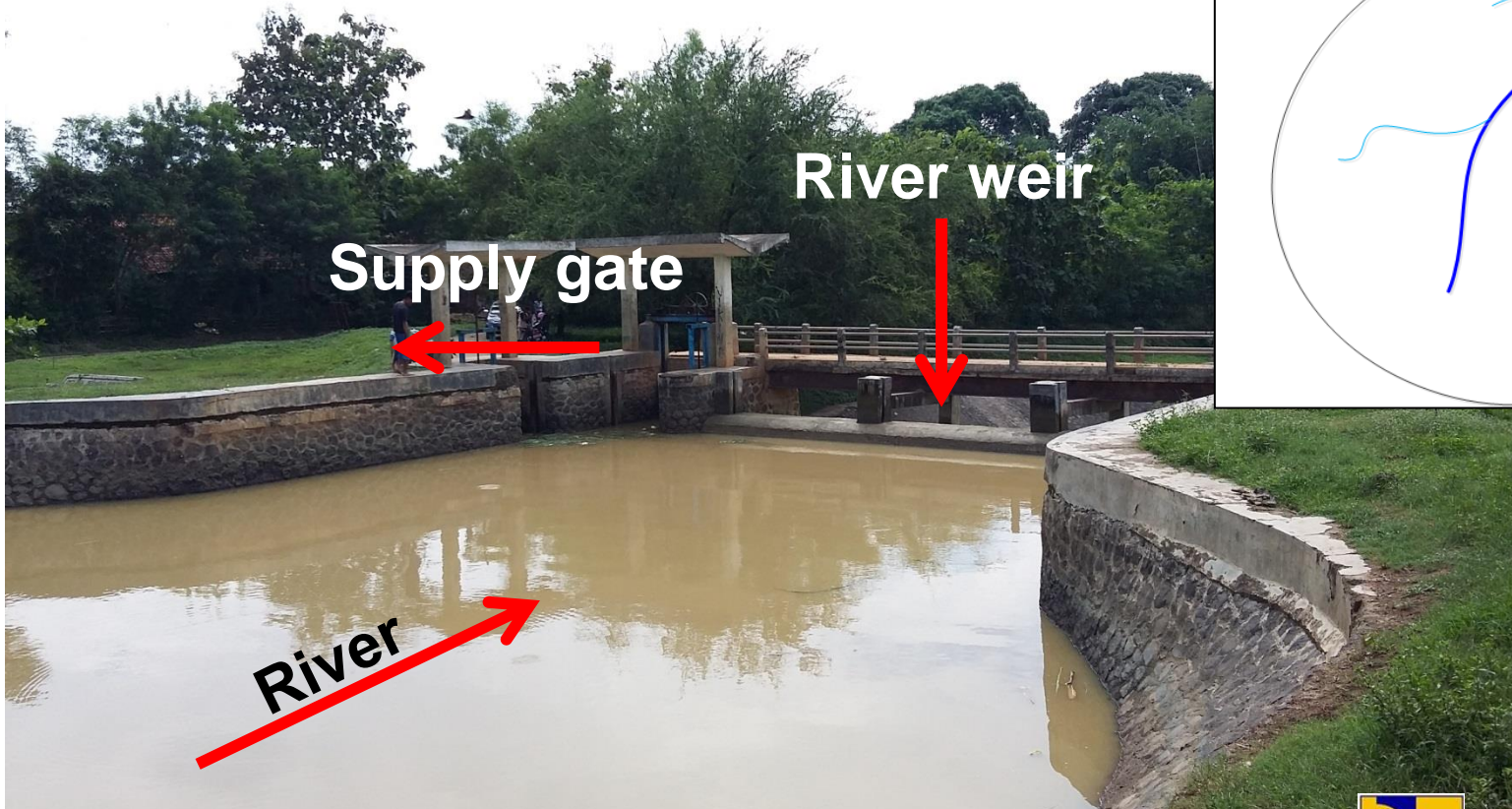
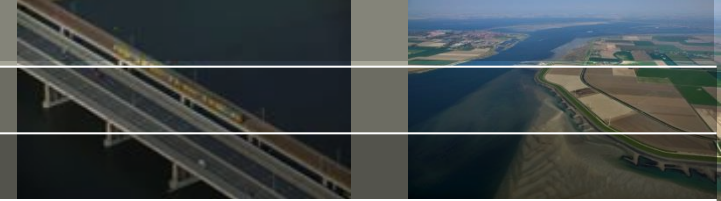
In 2015 an upgrade of existing irrigation assted management software (**SI RP2I-PAI**) has been commenced. SI RP2I-PAI relies on 3 groups of data:

1. The condition of the irrigation infrastructure;
2. the size and location of the irrigated areas and
3. the **water availability** as generated by the condition/capacity/size of the catchment

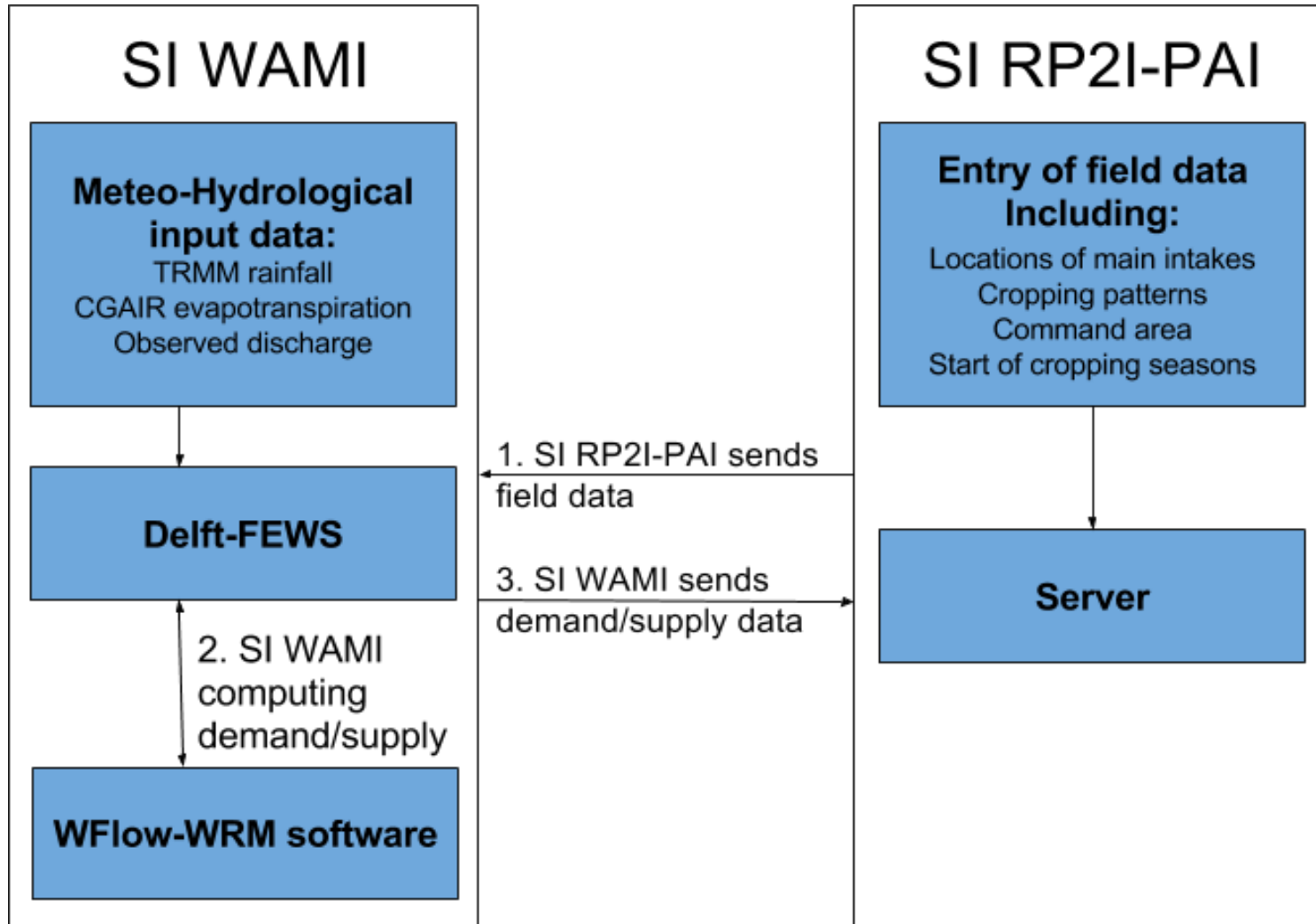
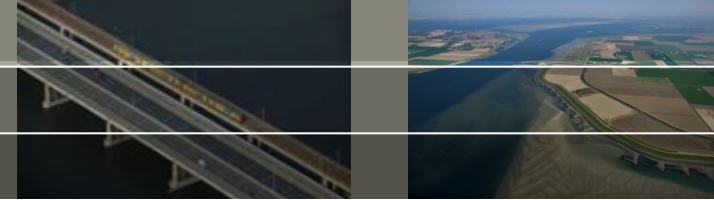
The **water availability** at **main intakes** is calculated by **SI WAMI**



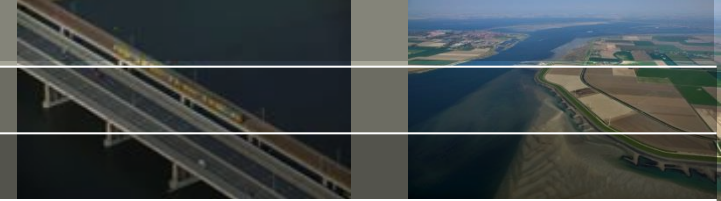
SI-WAMI objective: main intakes



System architecture



Field data entry in SI RP2I-PAI



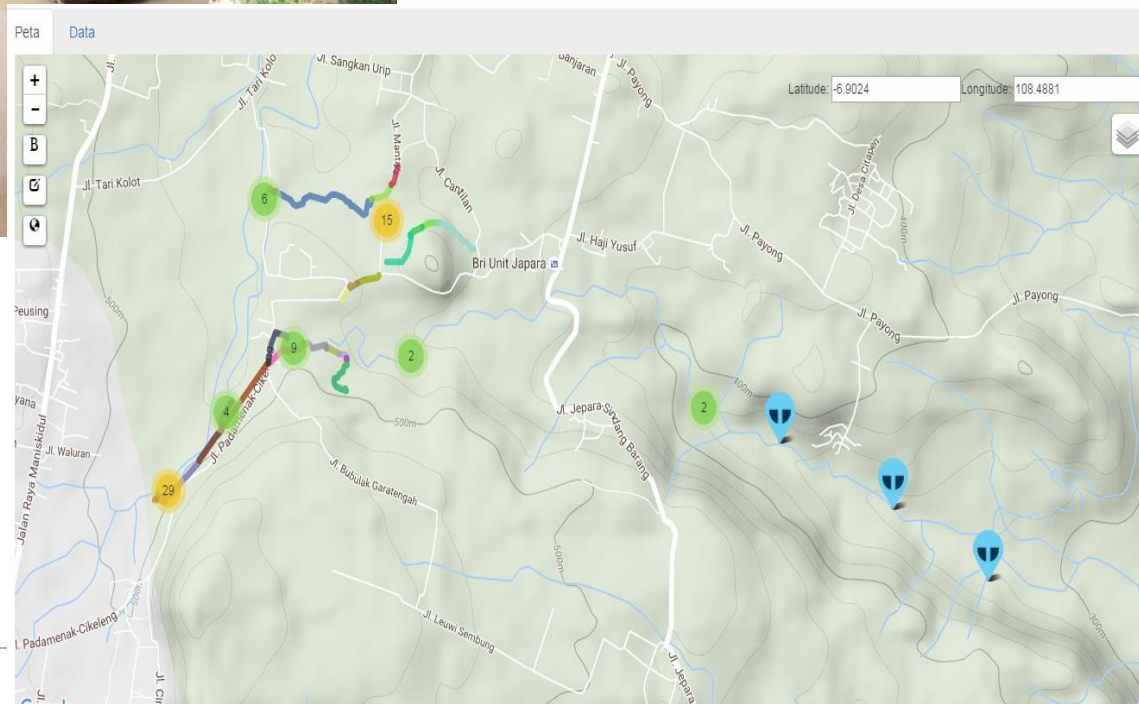
Data entry



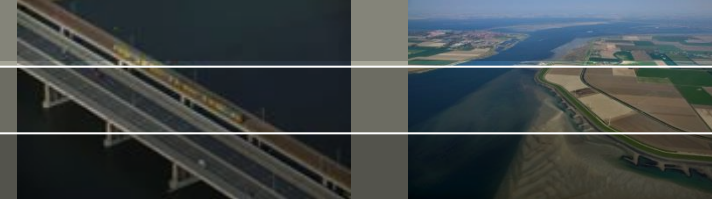
Data is entered in field:

- Location
- Cropping pattern + ha
- Start of the cropping seasons

Data is edited via tablets together with field operators
<https://sirp2ipai.pu.go.id/>

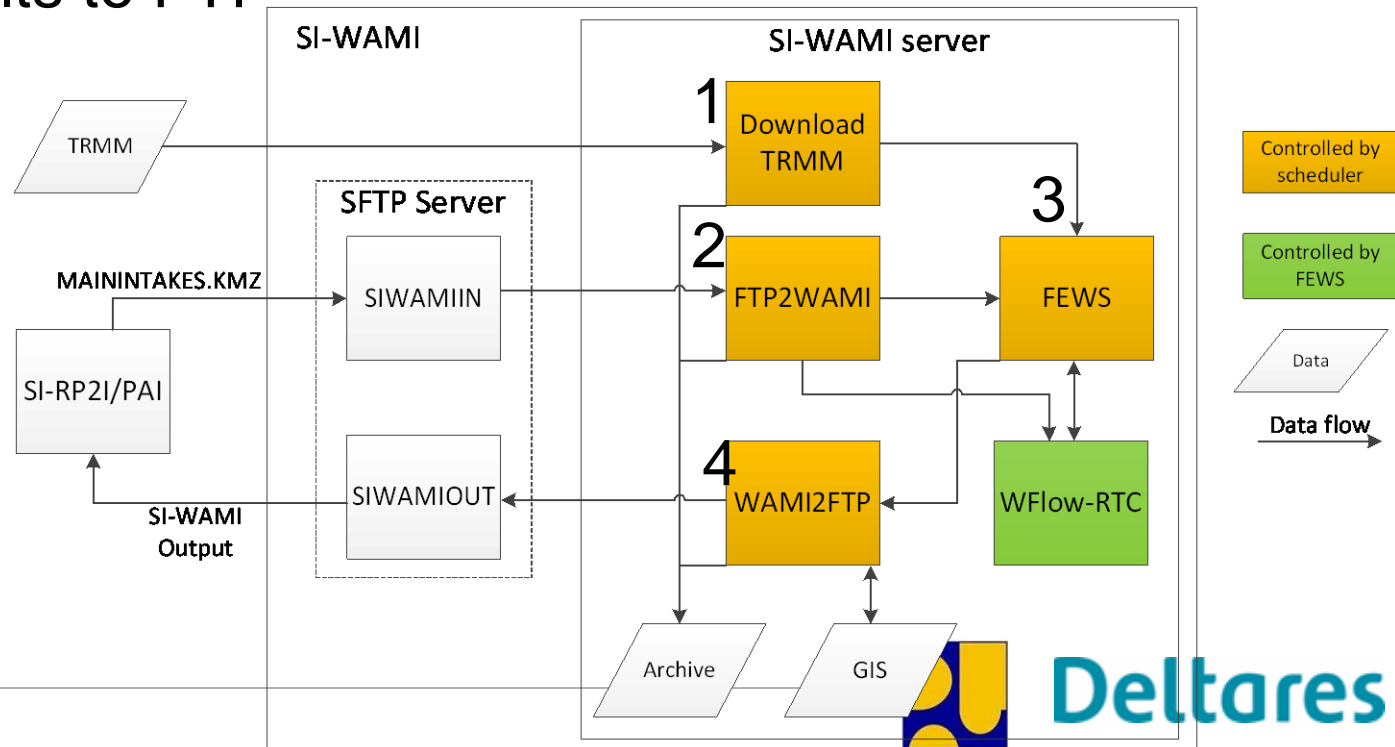


Automated FEWS



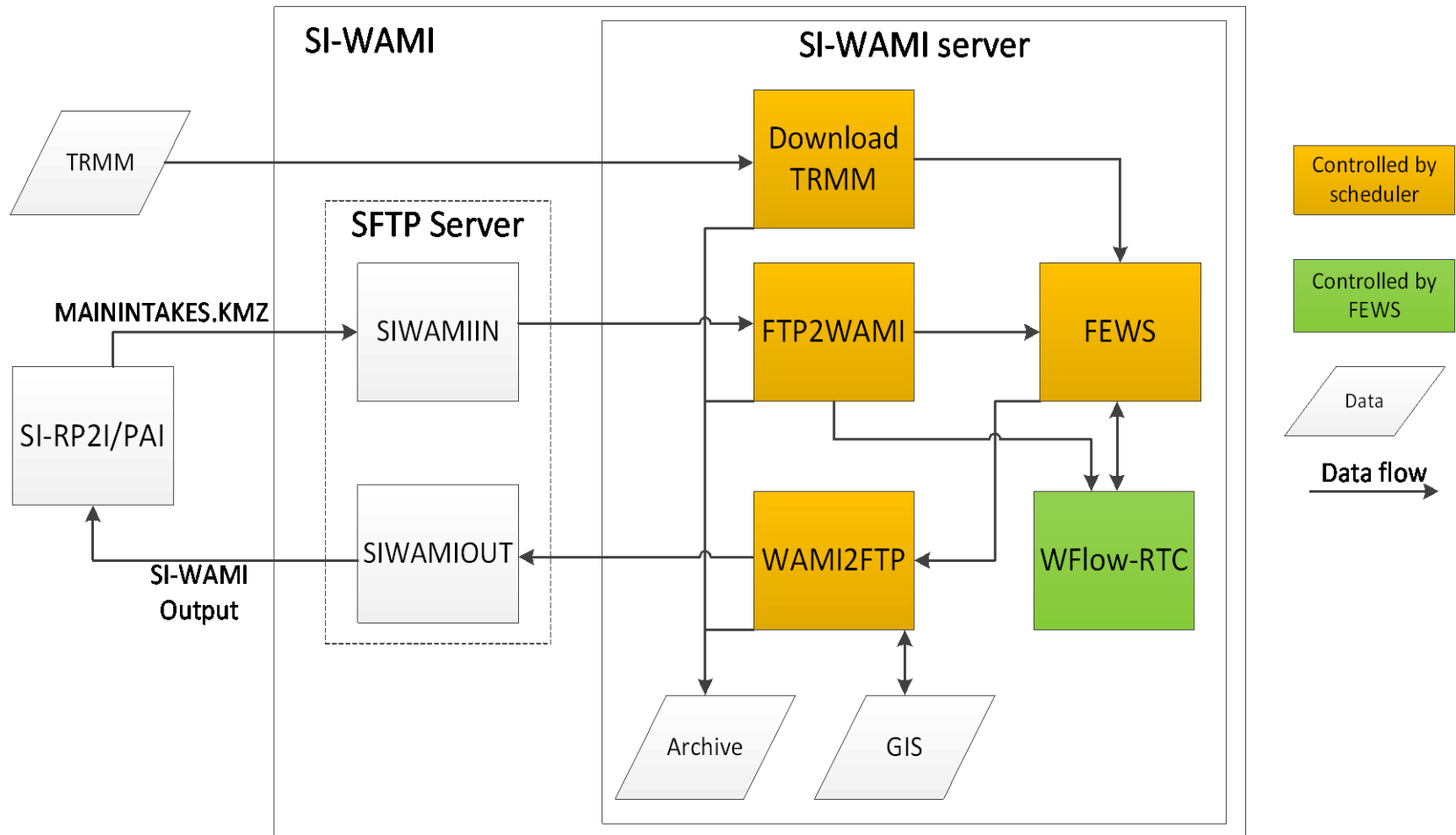
Data is send to an FTP, FEWS is run automated via the windows task scheduler:

1. Downloading TRMM rainfall
2. Downloading field data from the FTP
3. Updating the **Delft-FEWS** configuration and running workflows
4. Sending results to FTP

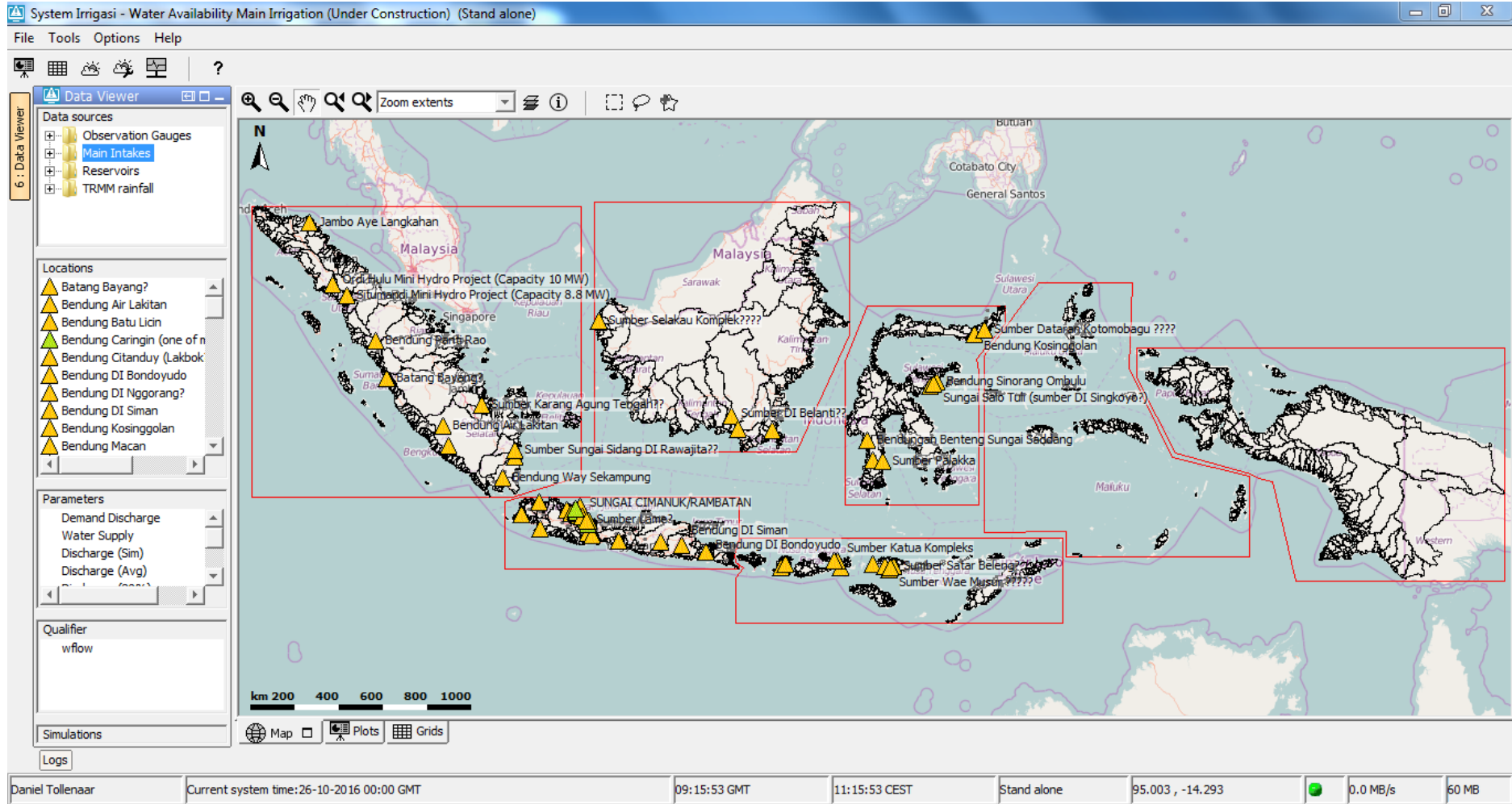
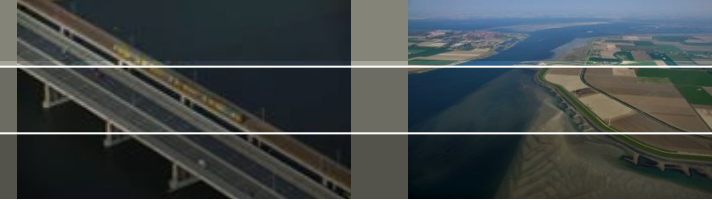


The system runs on a server at the Indonesian water resources institute (Pusair)

Automated FEWS: automatically updated

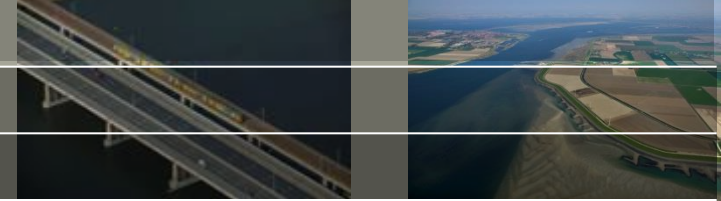


Automated FEWS: 'growing system'

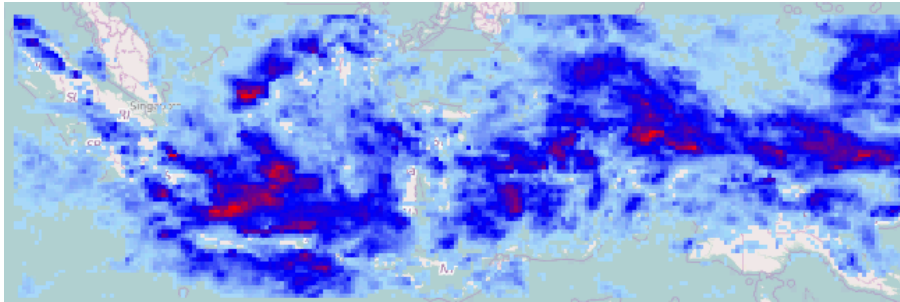


Deltares

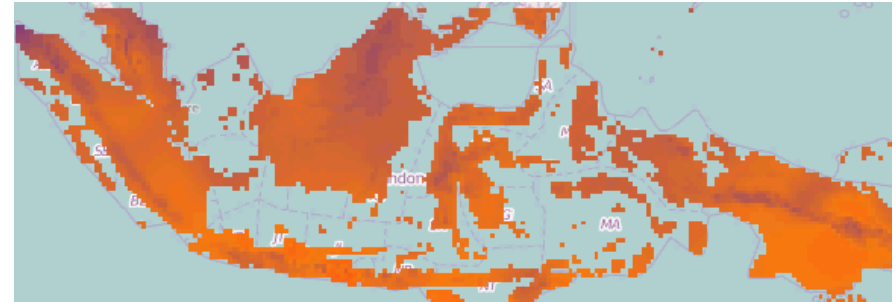
Wflow external module



TRMM rainfall

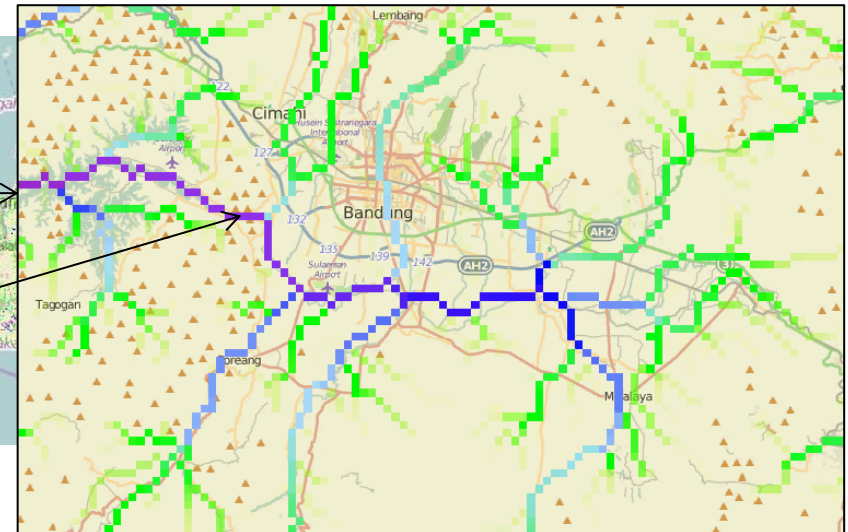
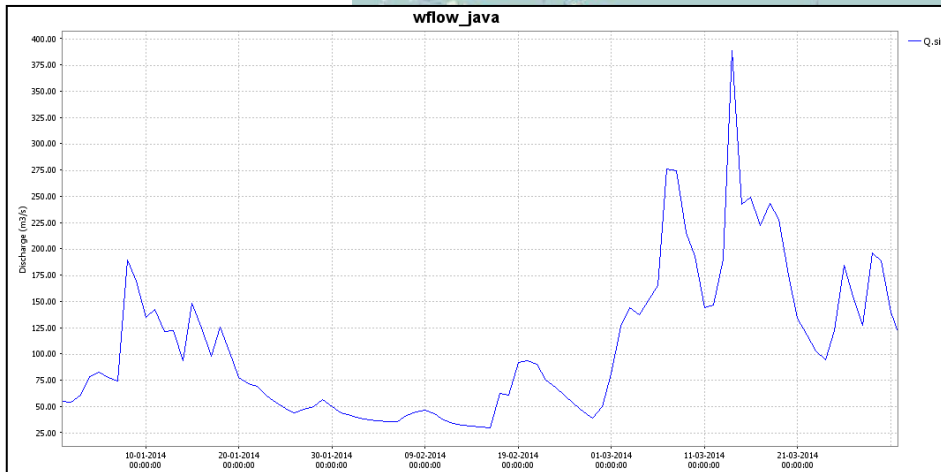


CGAIR evapotranspiration



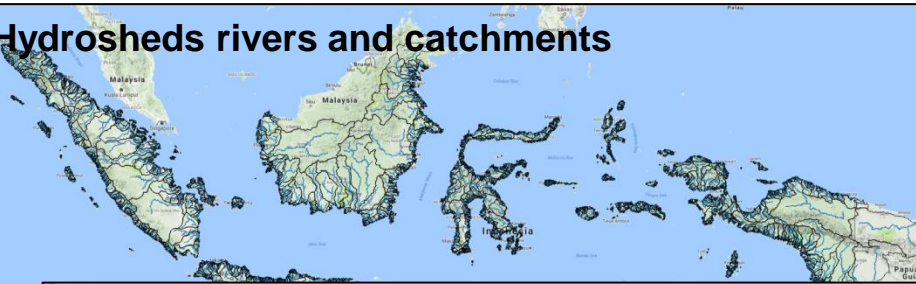
WFlow

Discharge

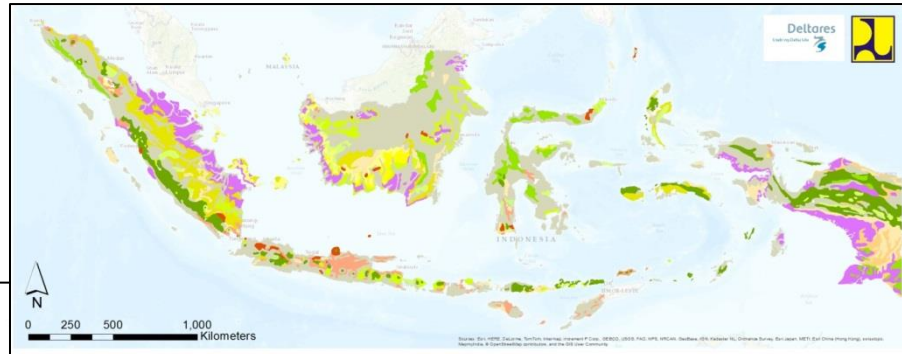
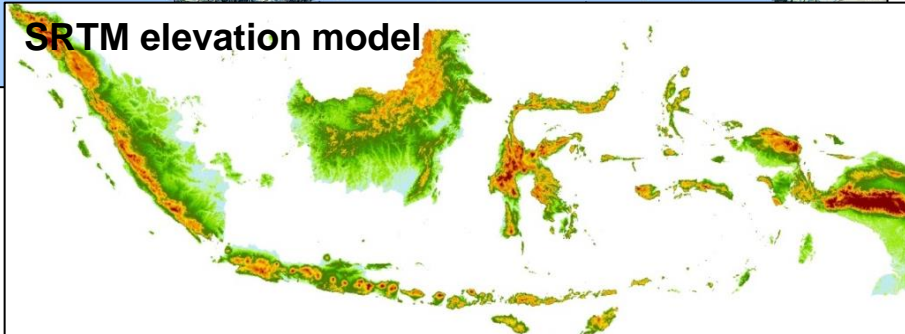


Wflow external module: computing hydrology for Indonesia

Hydrosheds rivers and catchments



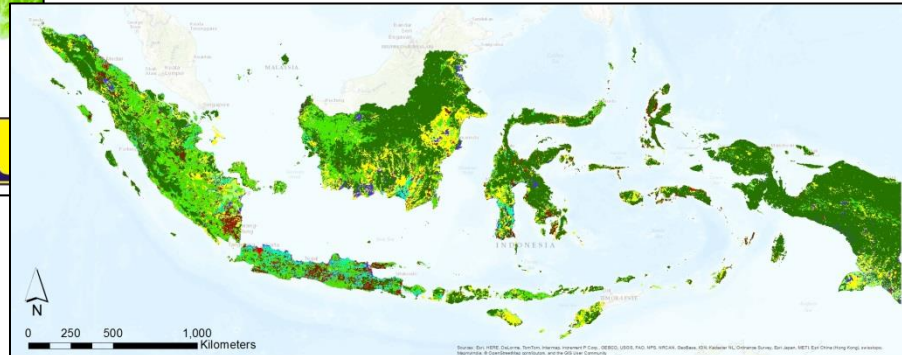
SRTM elevation model



Soil texture Indonesia

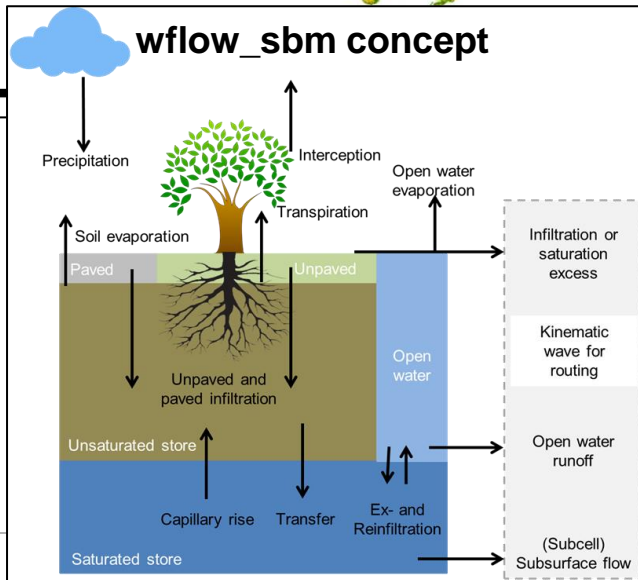
Top soil (0 - 30cm below Surface level) / Subsoil (30-100cm below Surface Level)

Clay (light) / Clay (heavy)	Clay-Loam/Clay-Loam	Loam / Loam	Clay-Loam (sandy) / Clay-Loam
Clay (light) / Clay (light)	Clay-Peat (loamy) / Clay-Peat (Loamy)	Loam/ Clay-Loam (sandy)	Clay-Loam (sandy) / Clay-Loam (sandy)
Clay(light) / Clay-Loam	Clay-Loam / Loam	Sand (loamy) / sand (loamy)	Loam(sandy) /Clay-Loam (sandy)
Clay-loam / Clay (light)	Loam / Clay-Loam	Sand / Sand	Loam (sandy) / Loam (sandy)



Landuse types Indonesia

Paved	Shrubland	Plantation
Bare area	Ricefield	Forest
Grassland	Crops	Water bodies

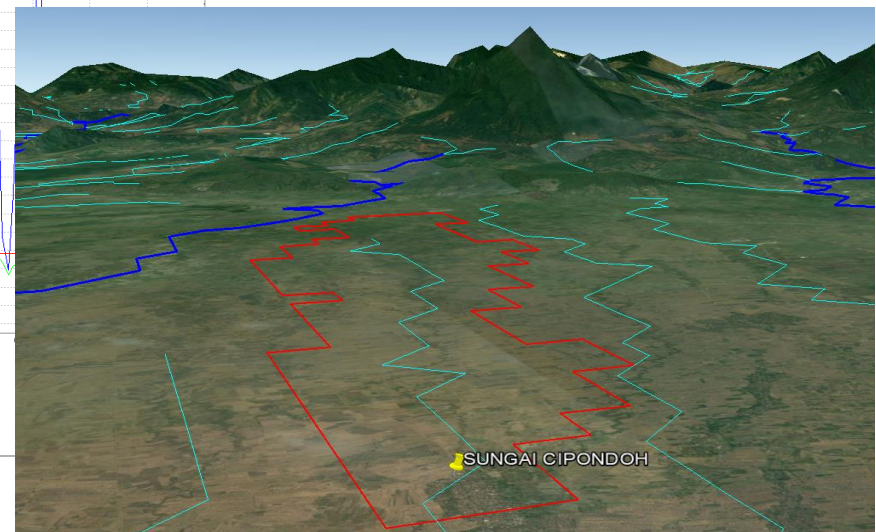
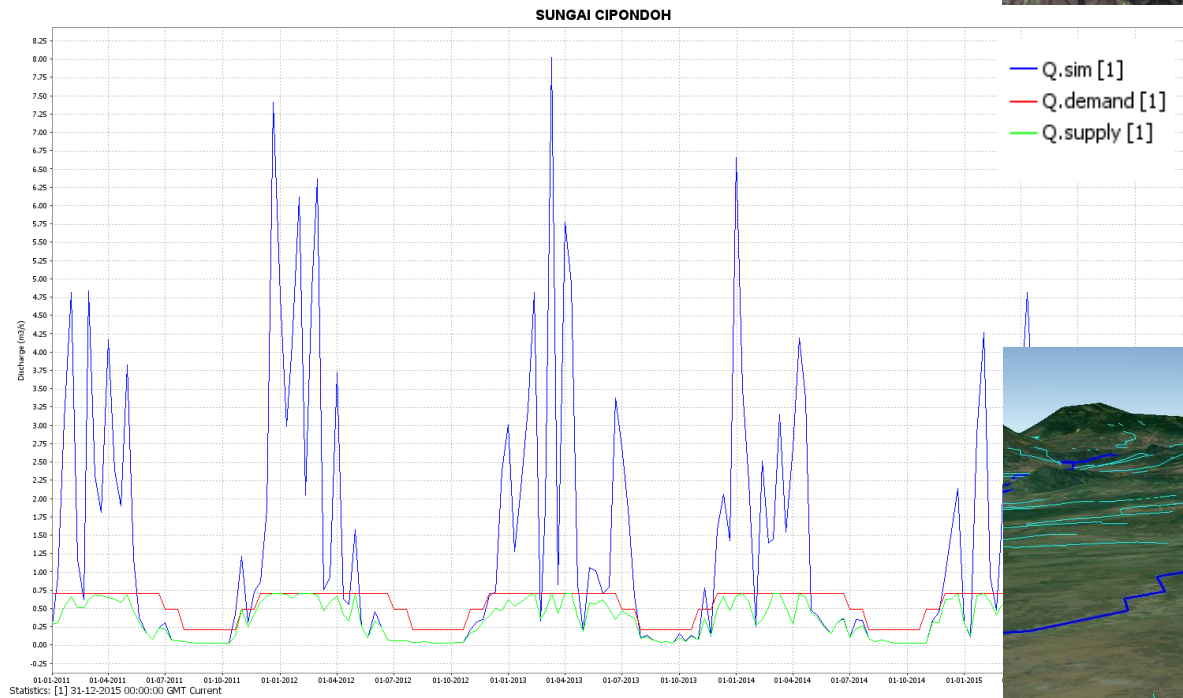


Deltares

Results

Hydrology should be validated at all main intakes, but initial results are very promising!

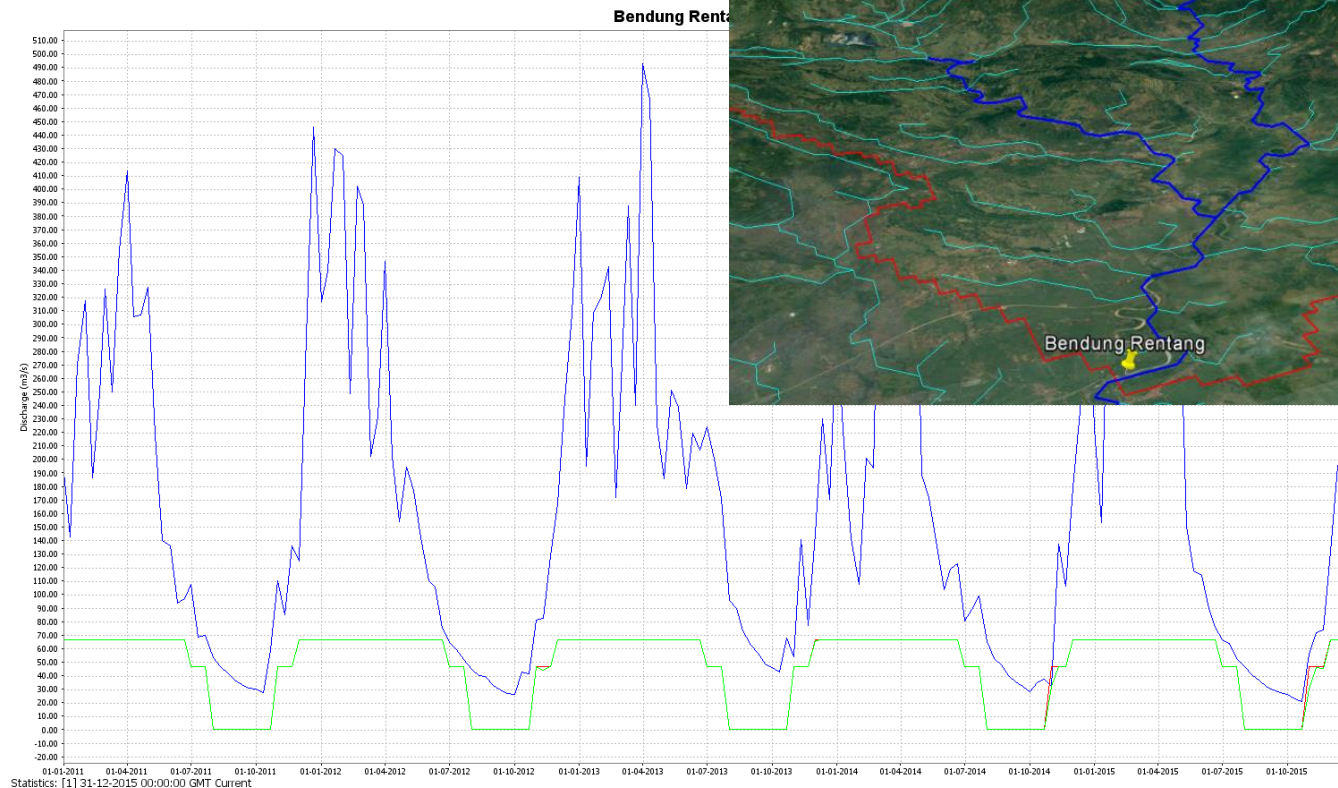
Cipondoh weir



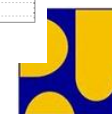
Results

Hydrology should be validated at all main intakes, but initial results are very promising!

Rentang weir



Statistics: [1] 31-12-2015 00:00:00 GMT Current

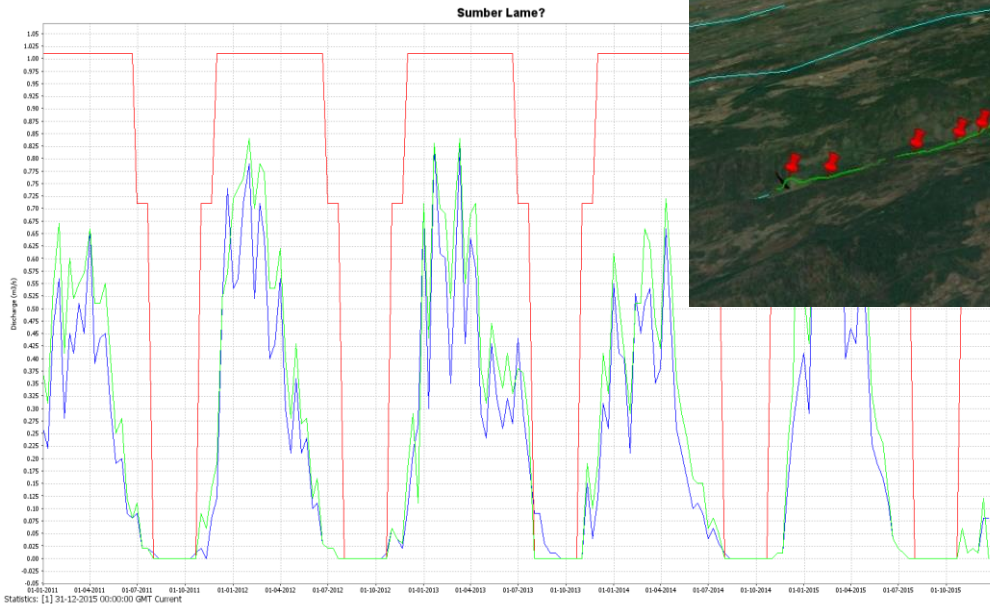


Deltares

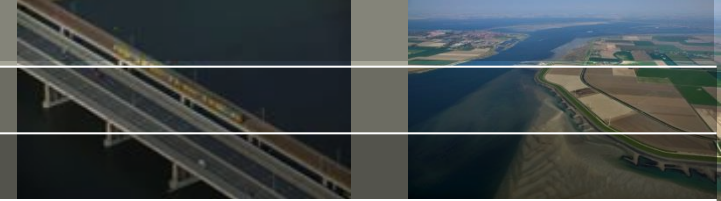
Results

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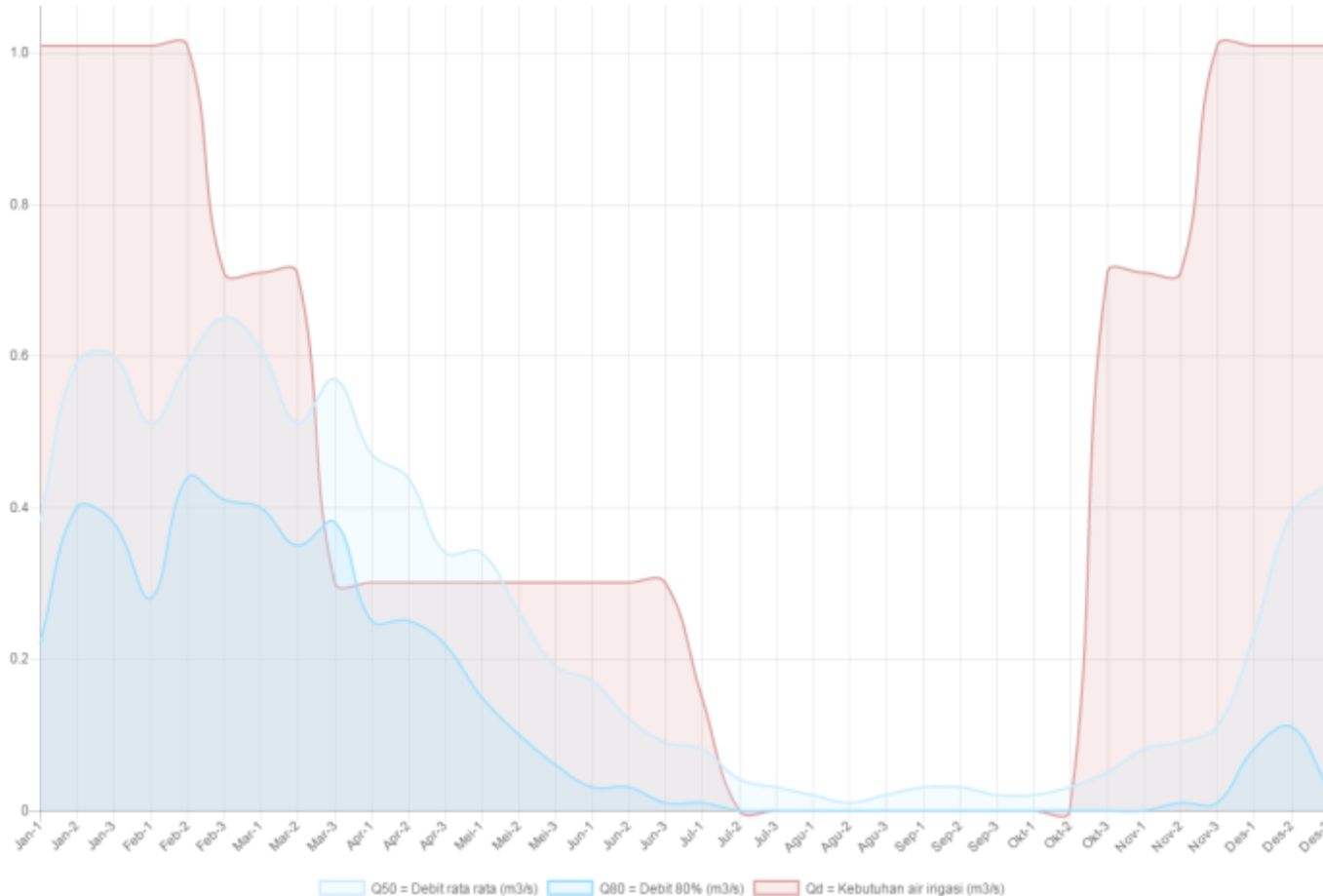
Lame weir



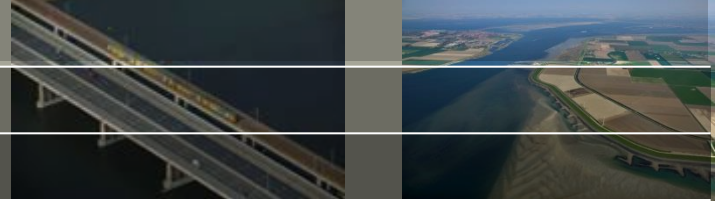
Results



Results are send FTP, imported by SI RP2I-PAI and available in the field on tablets



Conclusion



Pusair & Deltares successfully developed an information system, SI WAMI, to calculate water availability at main intakes for padi fields. Information will be used to underpin decisions on rehabilitation of irrigation infrastructure

SI WAMI will automatically grow when field-data is entered. However, validation of results is key in interpreting outcomes.

Besides the calculation of supply for irrigation SI WAMI can be expanded for hydropower generation, domestic water supply.

Building a water resources data-base covering an entire country will ultimately provide valuable data for strategy and planning studies.



Deltares