




Monitoring water productivity by Remote Sensing;

from science to reality

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Food and Agriculture Organization
of the United Nations

G4AW Towards More Impact

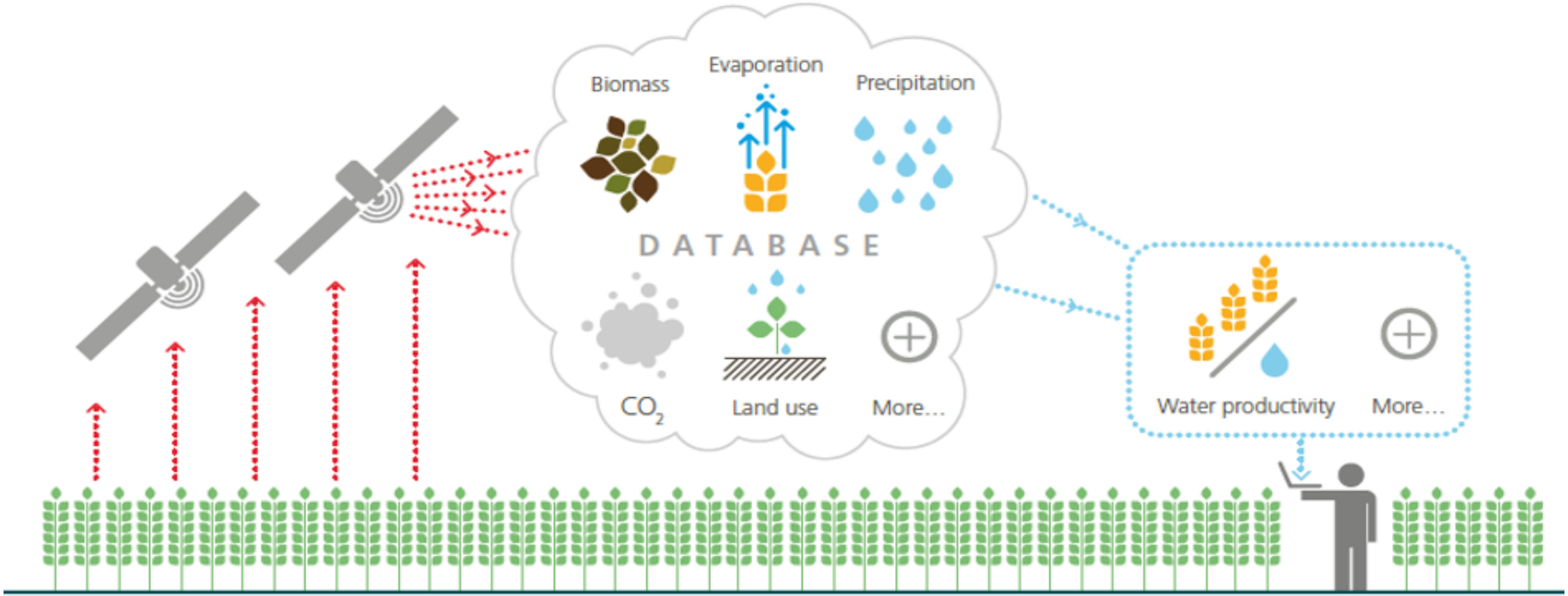
February 17, 2017 The Hague

G4AW
GEODATA FOR AGRICULTURE AND WATER

Netherlands Space Office

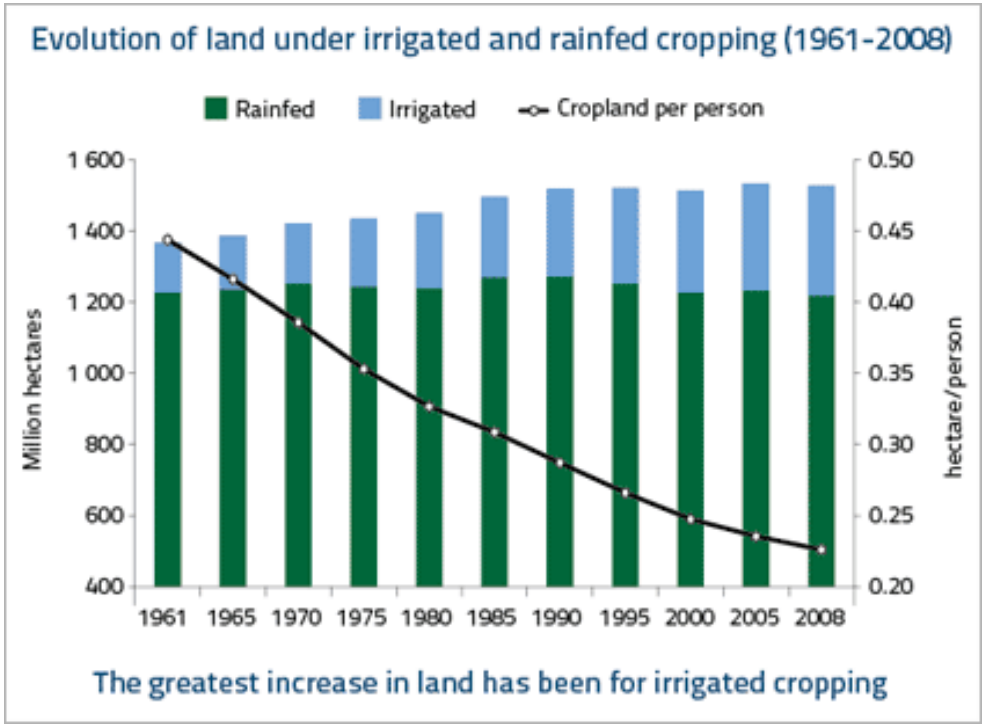
FAO FIAT PANIS

Using Remote Sensing in support of solutions to reduce agricultural water productivity gaps



Rationale

- In 2050 we need 60% extra food globally (100% in developing countries)
- 70% of the extra food needs to come from yield increases



Rationale

- Water productivity in development programs funded by The Netherlands should increase by 25%
- SDG 6.4

Economic

Increase water-use efficiency across all sectors

Environmental

Ensure sustainable withdrawals of freshwater

Social

Reduce number of people suffering from water scarcity

SDG - Target 6.4

SDG 6.4: By 2030, substantially increase water-use efficiency across all sectors and ensure sustainable withdrawals and supply of freshwater to address water scarcity, and substantially reduce the number of people suffering from water scarcity

Objective:

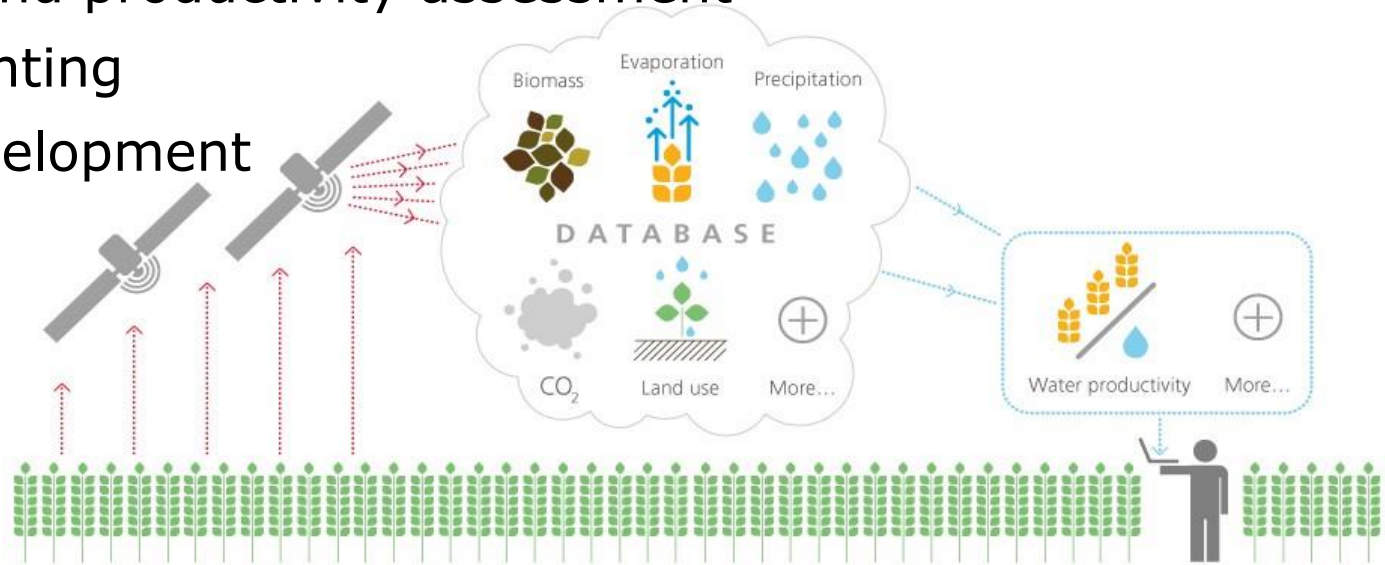
"To assist the member countries of FAO in:

- monitoring land and water productivity;
- identifying land and water productivity gaps;
- proposing solutions to reduce these gaps;
- contributing to a sustainable increase of agricultural production,

while taking into account ecosystems and the equitable use of water resources, which eventually should lead to an overall reduction of water stress."

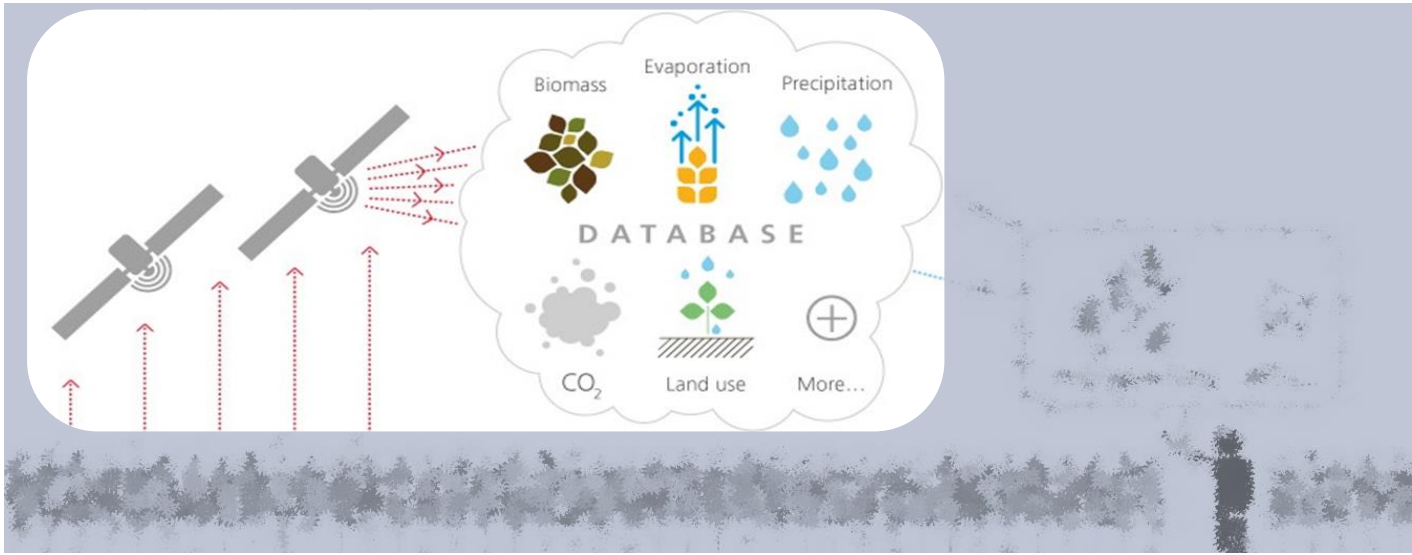
Components

1. Database
2. Water and land productivity assessment
3. Water accounting
4. Capacity development

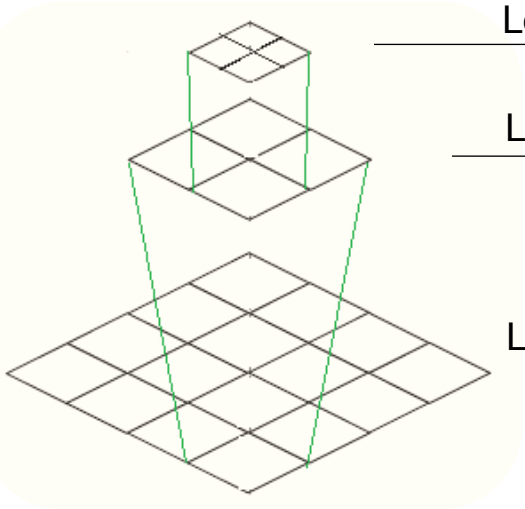


Components

1. Database



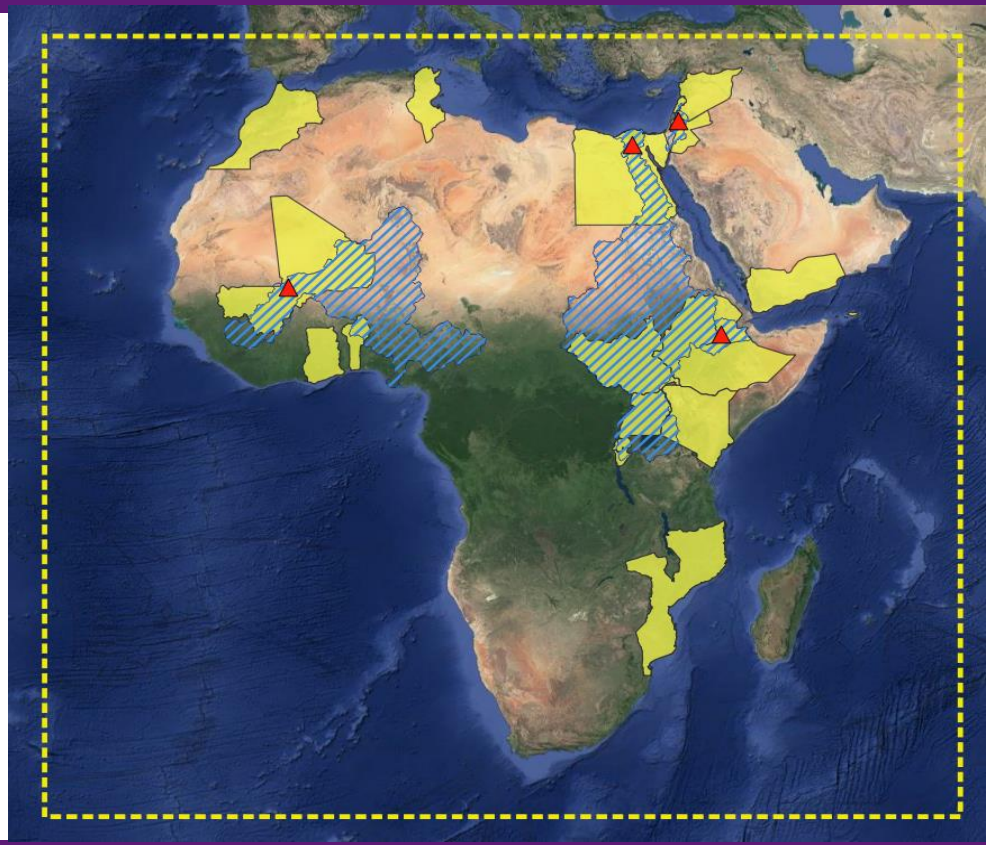
1. Database: structure



Level 3 – 30 m

Level 2 – 100 m

Level 1 – 250 m



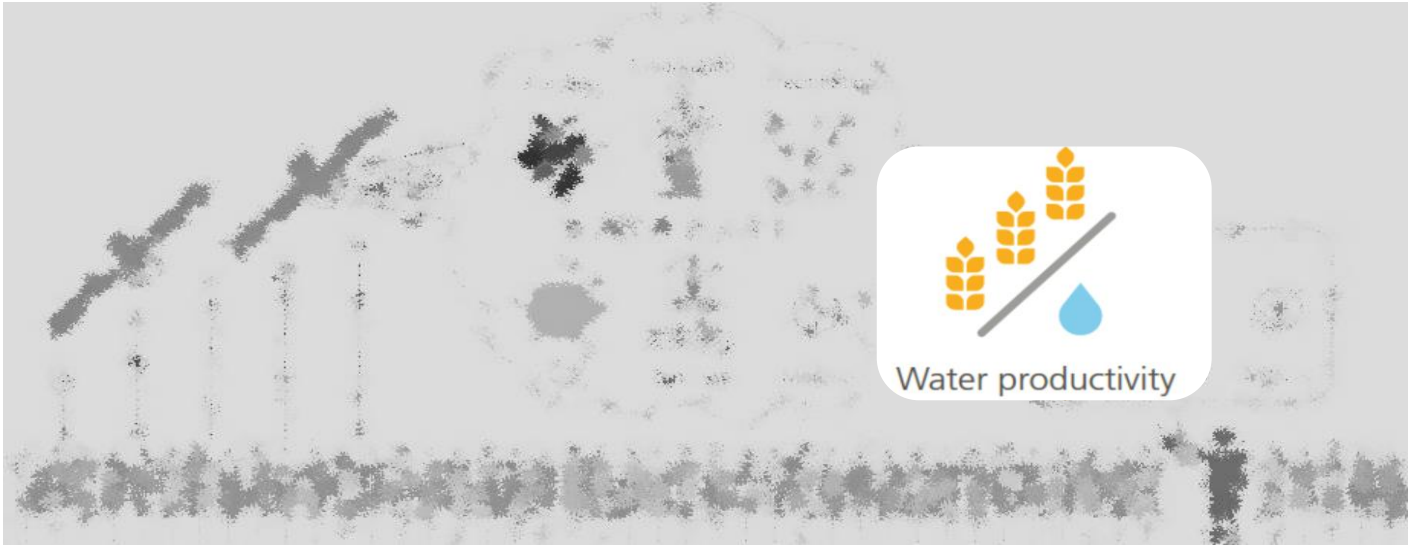
1. Database: structure

Data component	Level I[1] (250m)	Level II (100m)	Level III (30m)	Remarks
Actual ET	Dekad[2]	Dekad	Dekad	
Net Primary Productivity	Dekad	Dekad	Dekad	
Above ground biomass production	Dekad / Season[3]	Dekad /Season	Dekad / Season	
Crop calendars		Season	Season	
Harvest Index		Season	Season	
Reference ET	Daily			*Different resolution: 20km*
Precipitation	Daily			*Different resolution: 5km*
Land cover / Crop classification	Season	Season	Season	*Level specific classes*

[1] Level I: Continental, Level II: Country/River basin, Level III: Irrigation scheme.
[2] Dekadal refers to a period of approximately 10 days. It splits the month in 3 parts, where the first and second dekads are 10 days each and the last dekad ranges between 8 and 11 days.
[3] Seasonal refers to the growing season. The length and number may vary, with a maximum of 2 growing seasons per year.

Components

1. Database
2. Water and land productivity assessment



2. Water and land productivity assessment

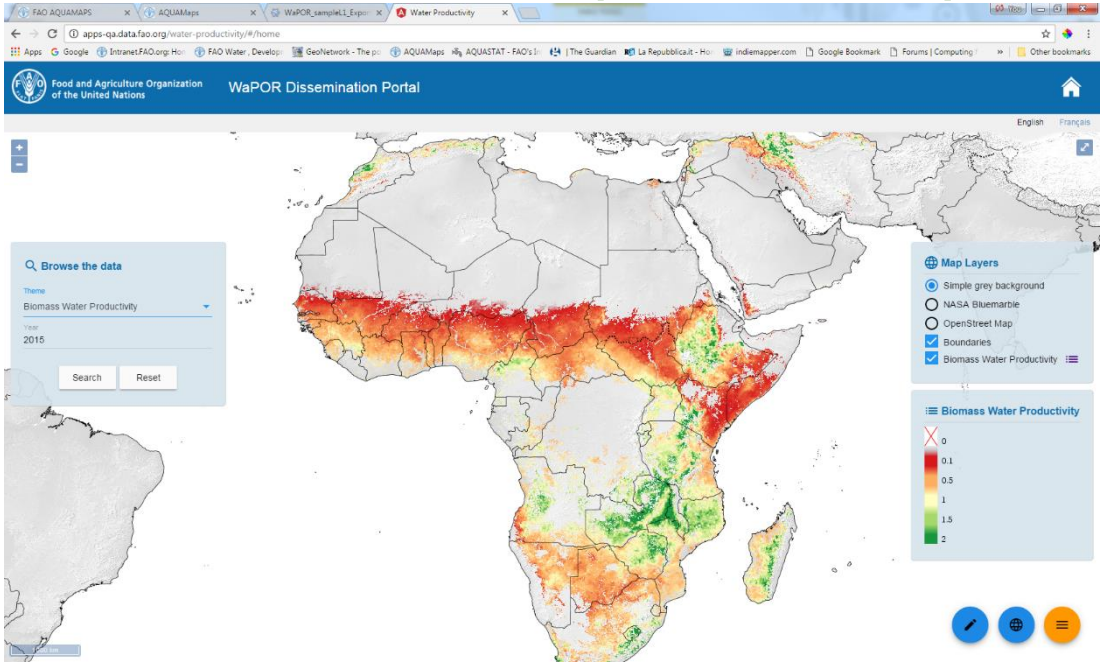
Data component	Temporal resolution	Level I (250m) Africa and Near East	Level II (100m) 18 countries and 4 River Basins	Level III (30m) 4 pilot areas of ~100,000 ha
Actual ET (separate E and T)	Decadal	x	x	x
Above ground biomass production	Decadal / Seasonal	x	x	x
Crop calendars	Seasonal		x	x
Harvest Index	Seasonal		x	x
Reference ET (20 km resolution)	Daily	x		
Precipitation (5 km resolution)	Daily	x		
Land cover / Crop classification (level specific method)	Seasonal	x	x	x

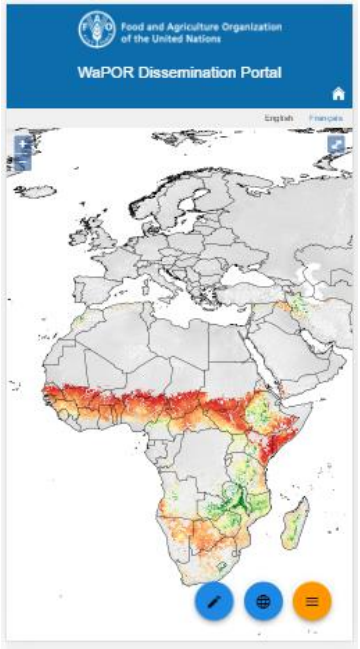
Level 1 – For major land cover classes:
- Total Biomass Water Productivity
- Biomass Water Productivity under rainfed conditions
- Biomass Water Productivity under Irrigated conditions
- Water Productivity Score

Level 2 – For three main cereals (maize, rice, wheat):
- Total Crop Water Productivity
- Rainfed Crop Water Productivity (under rainfed conditions)
- Irrigated Crop Water Productivity (under Irrigated conditions)

Level 3 – For all major crops in the scheme / sub-basin
- Rainfed Crop Water Productivity (under rainfed conditions)
- Irrigated Crop Water Productivity (under Irrigated conditions)
- Economic Water Productivity

2. Water and land productivity assessment

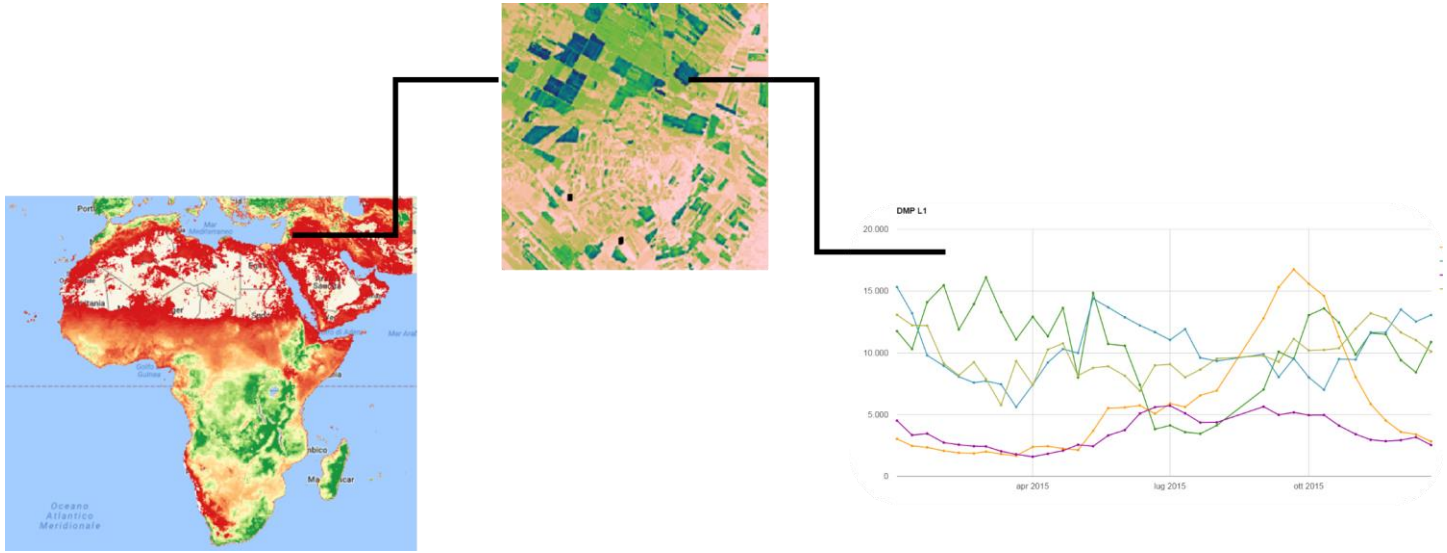




http://www.fao.org/in-action/remote-sensing-for-water-productivity/en/

2. Water and land productivity assessment

WaPOR - Open access portal for data distribution



Components

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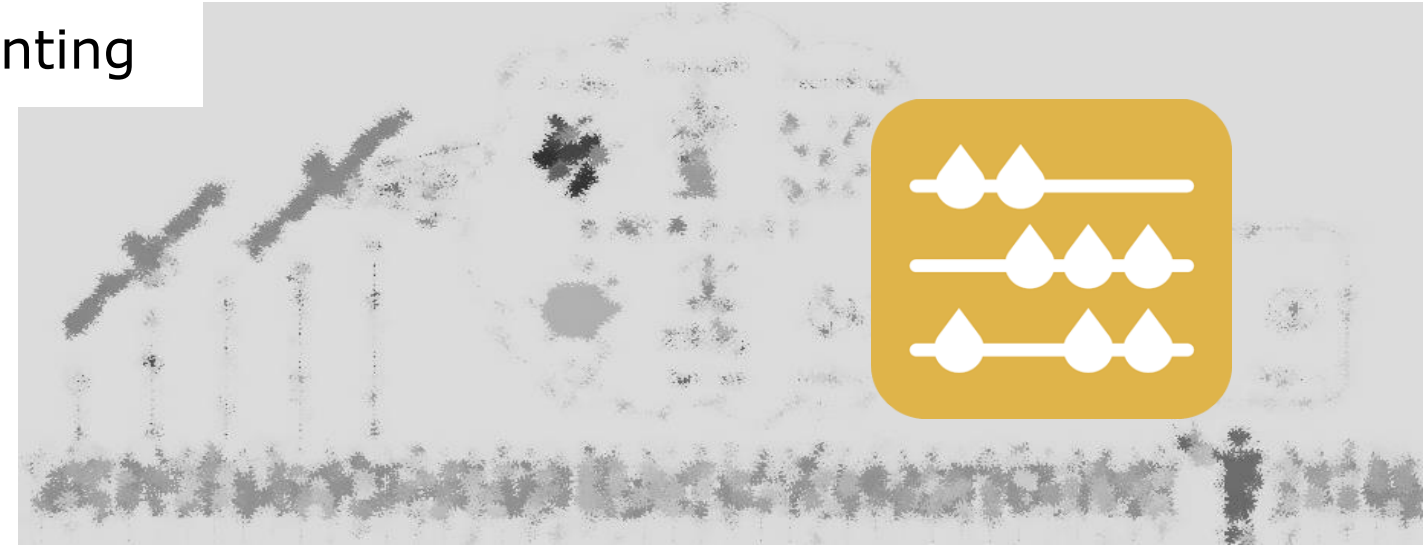
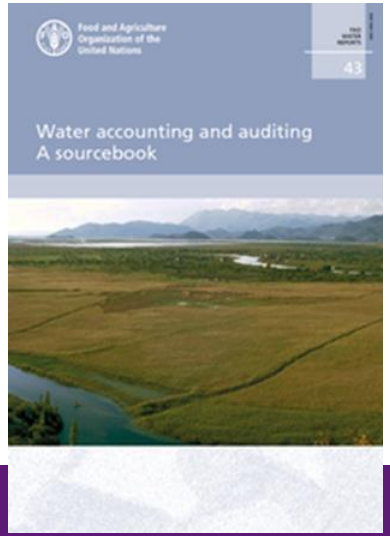


3. Water accounting

- Assessment of the consequences and sustainability of possible increases in water productivity by means of water accounting



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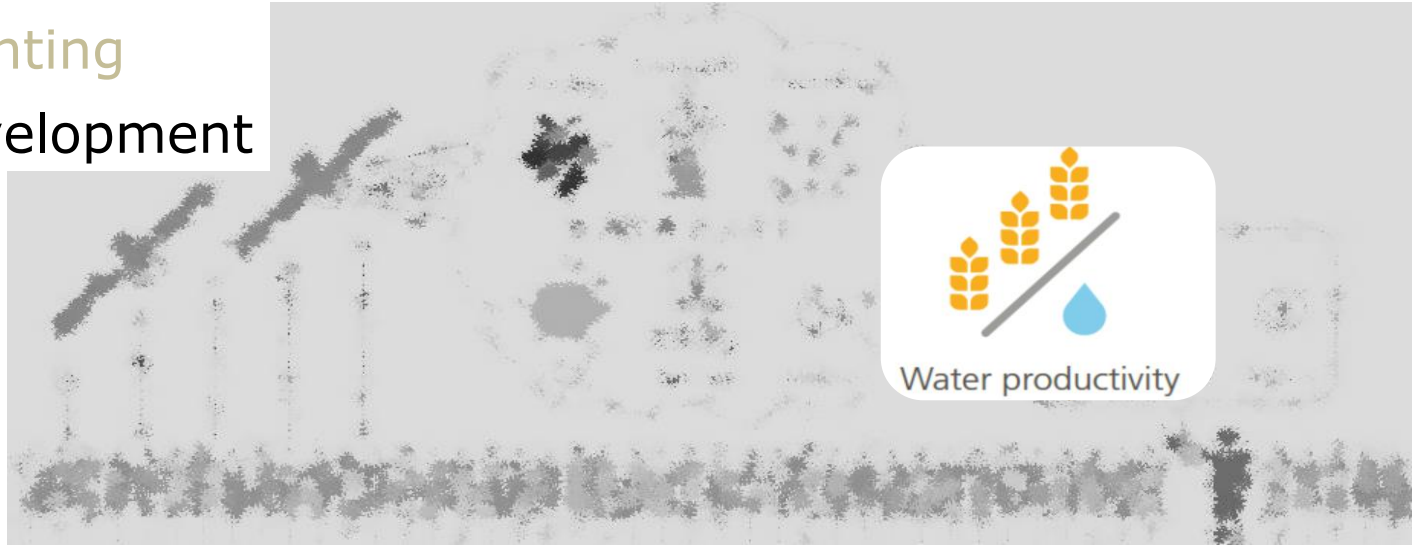
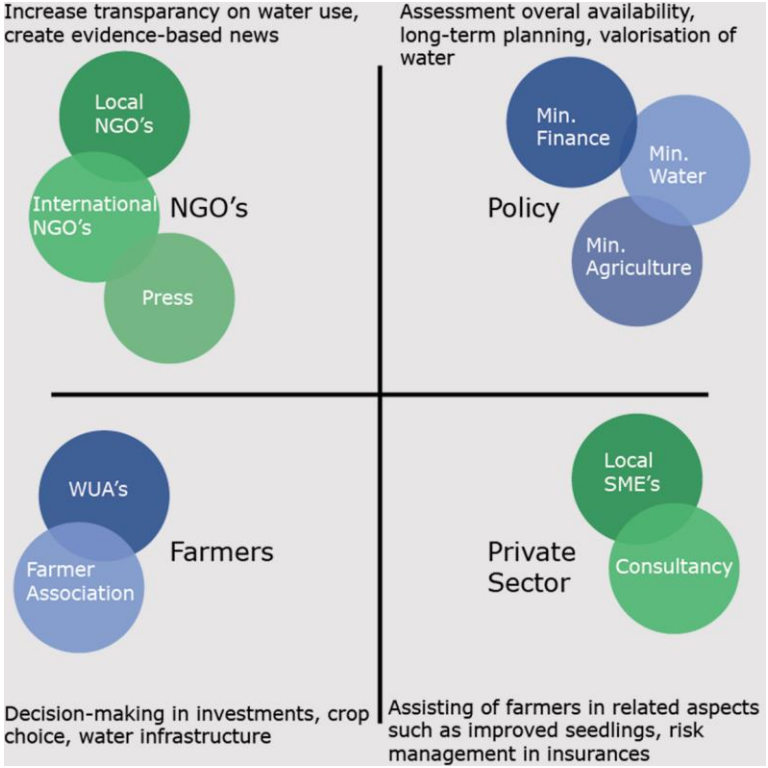
4. Capacity development



4. Capacity development

- For stakeholders to increase water productivity sustainably
  - National and international institutions
  - Outreach to farmers



Project components and roles

Database

Level 1

Level 2

Level 3

eleaf · vito · ITC UNIVERSITY OF TWENTE. · WATERWATCH FOUNDATION

Food and Agriculture Organization of the United Nations

Water and Land Productivity

Water accounting

Capacity development

IWMI International Water Management Institute

UNESCO-IHE Institute for Water Education

Solutions for reducing agriculture water productivity gaps and contribute to sustainable increase of production

Questions?

Thank you for your attention

G4AW is a programme commissioned by

Ministry of Foreign Affairs

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