Food and Agriculture Organization
of the United Nations

Remote Sensing-Based Estimation of Internal Renewable Water Resources

A global complement to country statistics derived from ground-based hydrological estimates

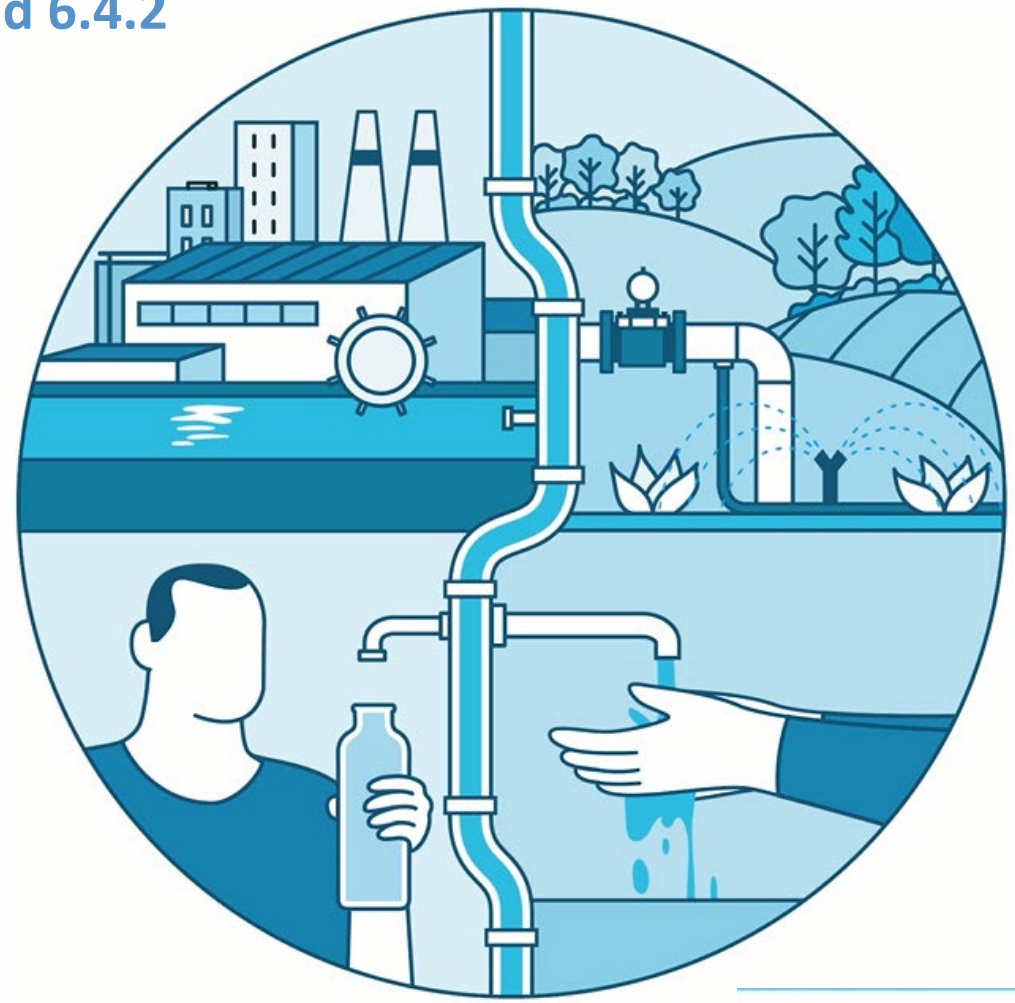
Livia Peiser
SENIOR LAND AND WATER OFFICER

FAO is custodian agency for 6.4.1 and 6.4.2

Food and Agriculture Organization of the United Nations

- FAO Custodian Agency of 2 indicators: 6.4.1 and 6.4.2;
- Only 41% of countries actively submitted the questionnaire in 2024

The main challenge for this indicator is therefore obtaining enough information to demonstrate increases in value added per unit of water withdrawn, especially in the poorest regions.



SUSTAINABLE DEVELOPMENT GOAL 6

Clean water and sanitation

Ensure availability and sustainable management of water and sanitation for all.

SUMMARY TABLE

INDICATORS

6.4.1 6.4.2

6.4.1 Change in water-use efficiency over time	FAO
6.4.2 Level of water stress: freshwater withdrawal as a proportion of available freshwater resources	FAO

AQUASTAT

- Information system on water resources and agricultural water management.
- Data provided by National Correspondents on:

  - **Water resources**: internal, transboundary, total
  - **Water use**: by sector, by source, wastewater
  - **Irrigation**: location, area, typology, technology, crops
  - **Dams**: location, height, capacity, surface area
  - And Water-related institutions, policies and legislation.

(Internal) Renewable Water Resources

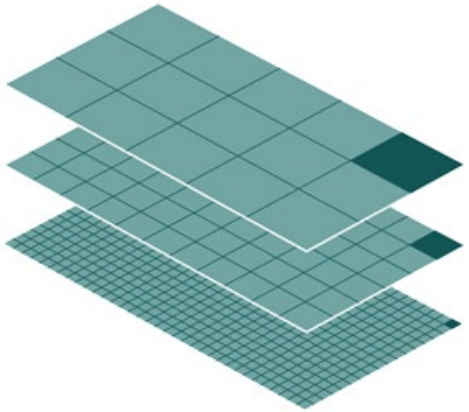
IRWR

"long-term average annual flow of rivers and recharge of aquifers generated from endogenous precipitation."

WaPOR provides actionable information

Near-real time (every 10 days) data on biomass development and water consumption (actual evapotranspiration), in addition to agro-climatic parameters on a daily time step (reference ET and precipitation).

Spatial resolution ranges between 300 m and 20 m



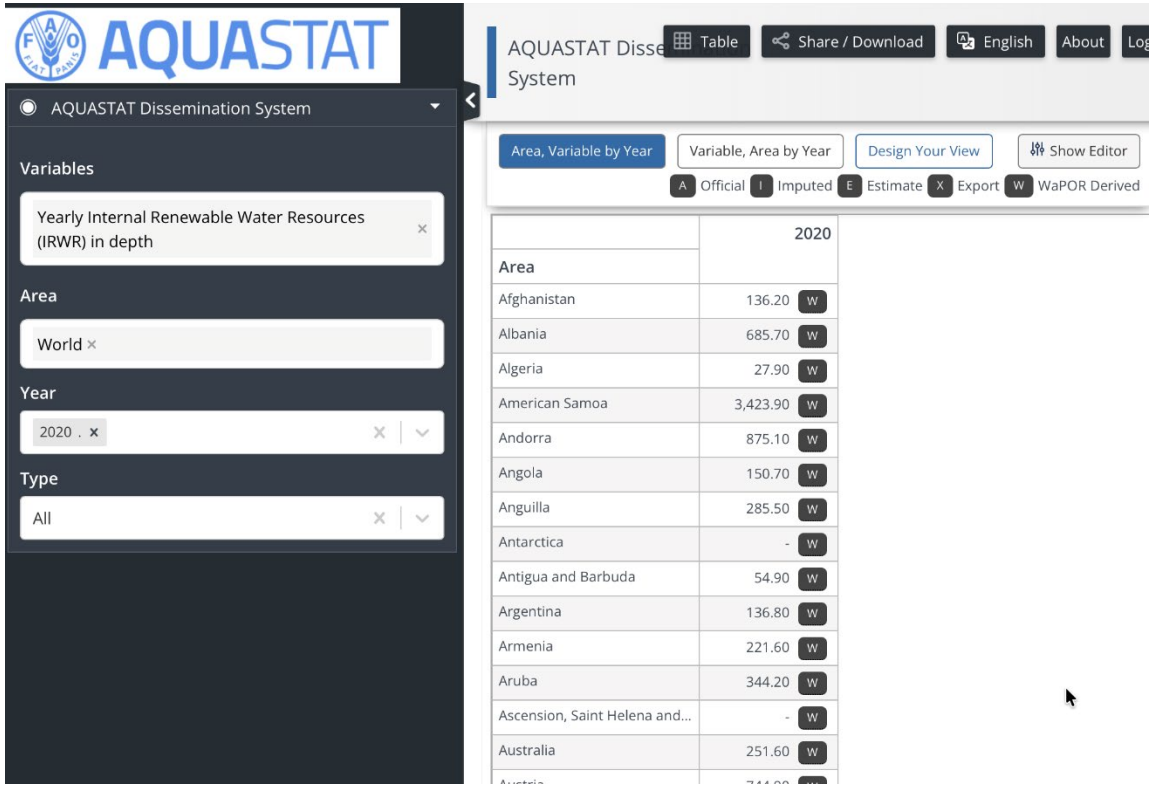
300m

100m

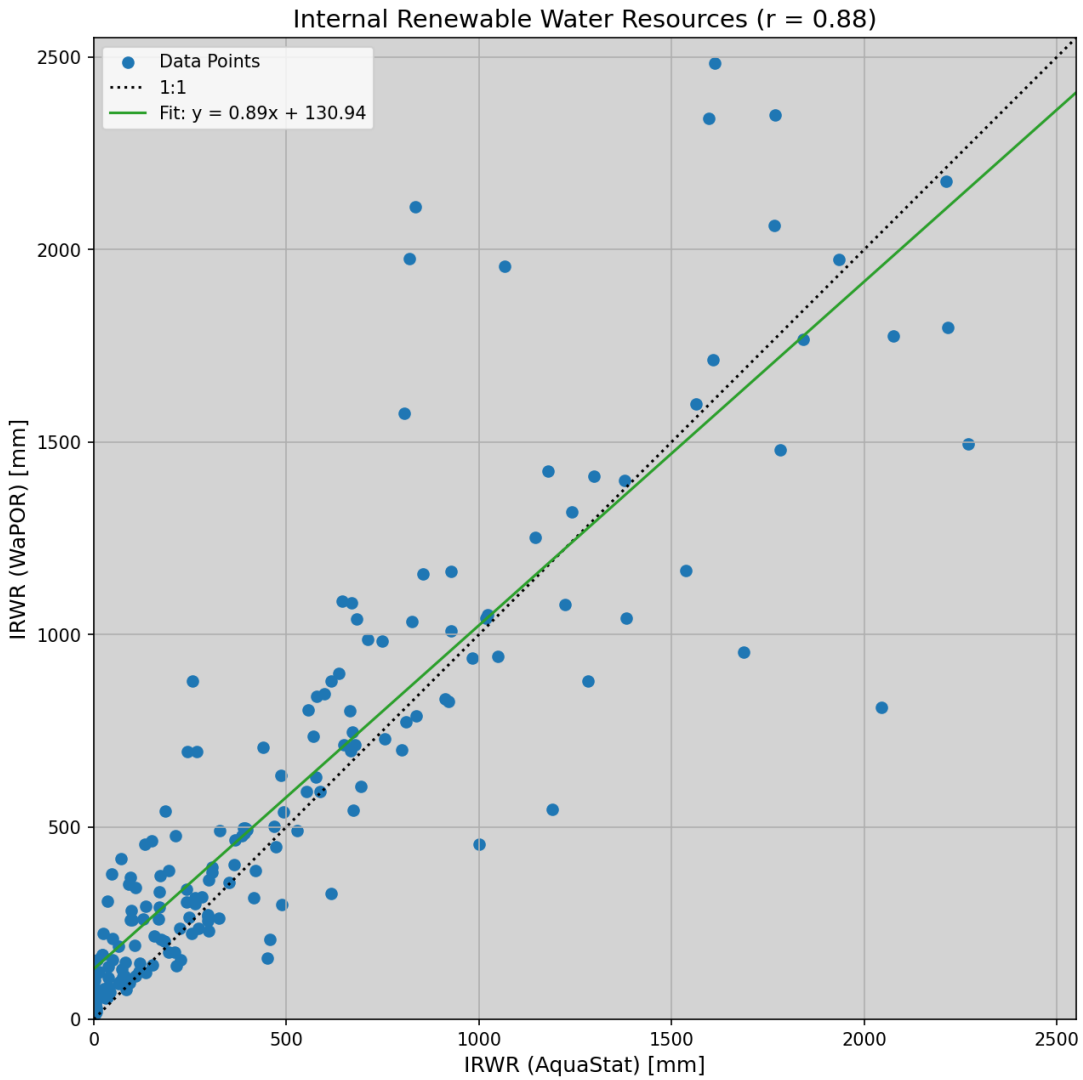
20m (new test 10 m, daily data)

Methodology

- IRWR = max(PCP – AETI, 0)
- Calculation done at annual time-step
- Results aggregated per country
- PCP north of 60°N taken from IMERG



Results


Internal Renewable Water Resources (r = 0.88)
Data Points
1:1
Fit: y = 0.89x + 130.94
IRWR (WaPOR) [mm]
IRWR (AquaStat) [mm]
0
500
1000
1500
2000
2500

Conclusions

- WaPOR can play an important role in providing operational water accounting tools.
- Allows for filling data availability in AQUASTAT
- Aggregation to other delineations (than country borders) can be explored.

Thank you