Open, big data on water and agriculture in support of monitoring and obtaining the Sustainable Development Goals

Jippe Hoogeveen, Land and Water Division, FAO | 04 October 2022

Water and agriculture in a changing climate

"Number of undernourished people continues to increase slowly" (690 M)

[*FAO Status of Food Insecurity 2020*]

"Achieving sustainable development faces a key challenge: 3.2 billion people live in agricultural areas with high to very high water shortages or scarcity."

[FAO Status of Food and Agriculture 2020]

"From 2000 – 2019 total cropland increased with 63 M ha, almost 85% of this increase is irrigated."

[FAO State of Land and Water 2022]

FAO and the SDG's

- 17 Sustainable Development Goals;

- Global indicator framework includes 231 unique indicators;

- FAO custodian agency of 21 SDG indicators and is a contributing agency for a further 5;

- FAO's Chief Statistician leads the monitoring.

FAO and the SDG's

- SDG 2 indicators:
  Custodian agency for **10** indicators

- SDG 14 indicators:
  Custodian agency for **4** indicators
  Contributing agency for **1** indicators

- SDG 15 indicators:
  Custodian agency for **3** indicators
  Contributing agency for **2** indicators

- SDG 6 indicators:
  Custodian agency for **2** indicators

- SDG 5 indicators:
  Custodian agency for **2** indicators

- SDG 12 indicators:
  Custodian agency for **1** indicators

- SDG 1 indicators:
  Contributing agency for **2** indicators

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Water productivity in agriculture measures the yield (kg/ha) per unit of water consumed (m^3/ha).

Measuring these two variables is not easy at appropriate scales for decision making

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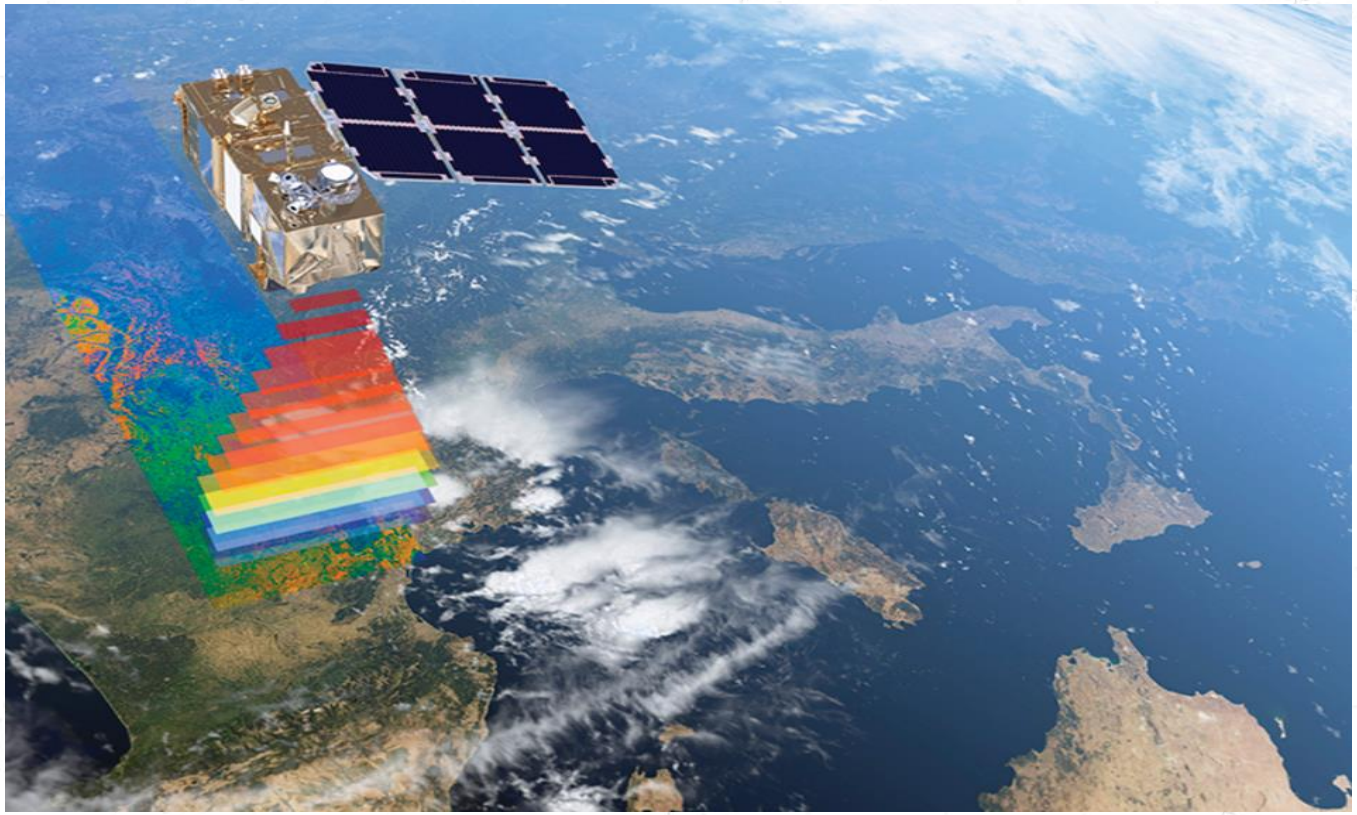
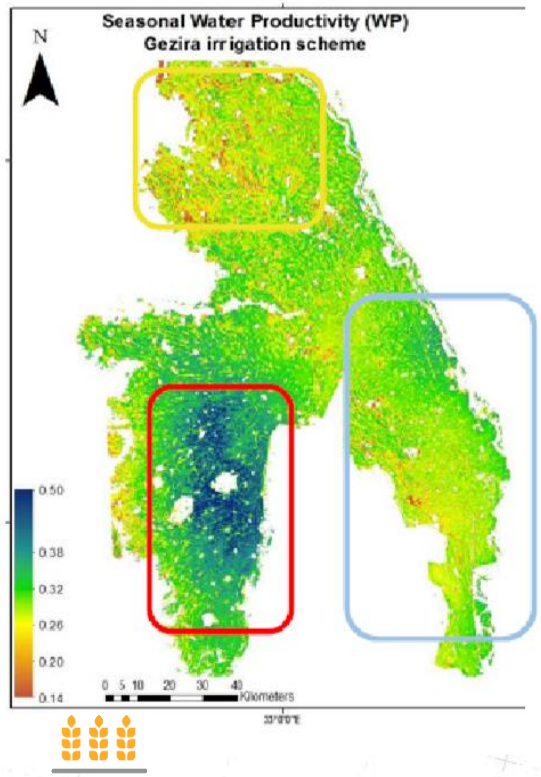
Satellites can help monitor water productivity in cost-effective ways.

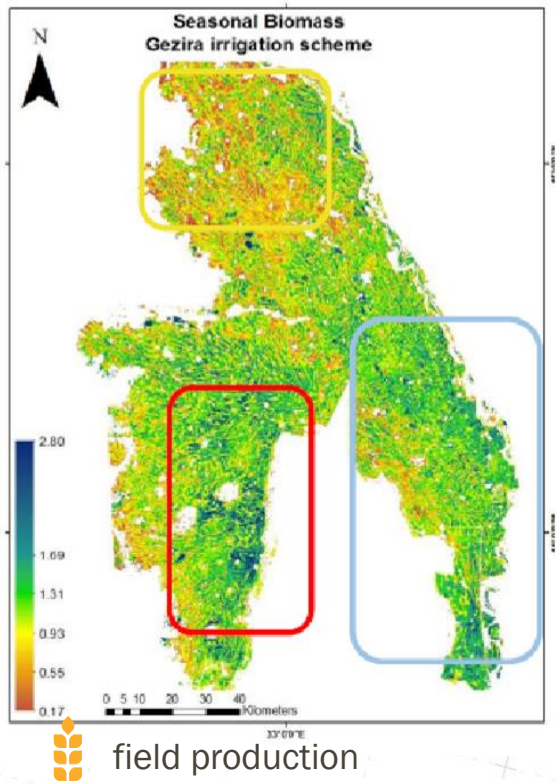


Applications:
Performance indicators to understand variability

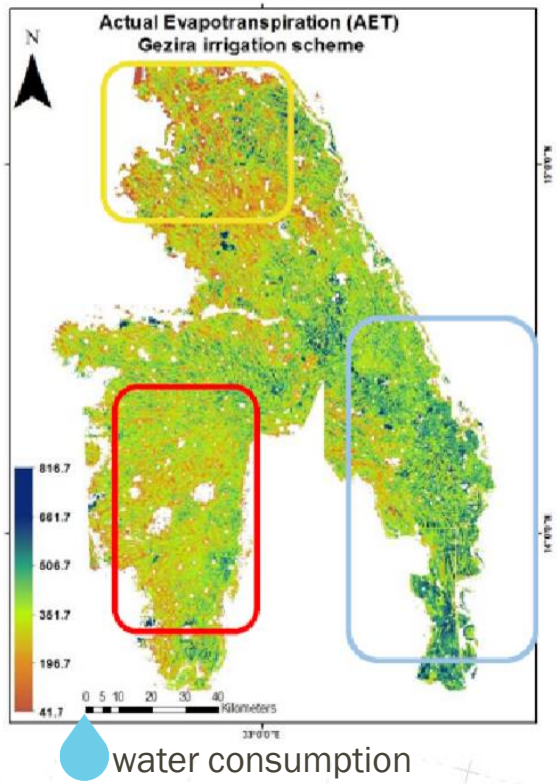
In the Gezira irrigation scheme (Sudan) WaPOR data helps monitor how different zones are performing.

Water Productivity





field production



water consumption

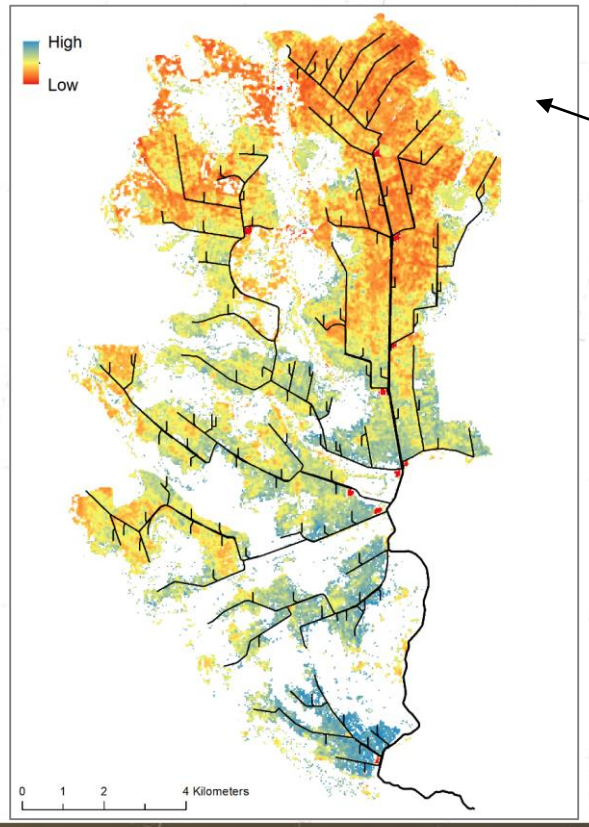
Struggling area needing intervention: **Low water productivity** with a low field production but also a low water consumption

Best performing area: **High water productivity fields** with a fairly high production and a low water consumption

Mixed zones of high and low productivity

Applications:

Piloting field-level approaches for increasing WP (Koga, Ethiopia)



Distinct spatial pattern between head and tail end;

Tail end has lower Water Productivity;

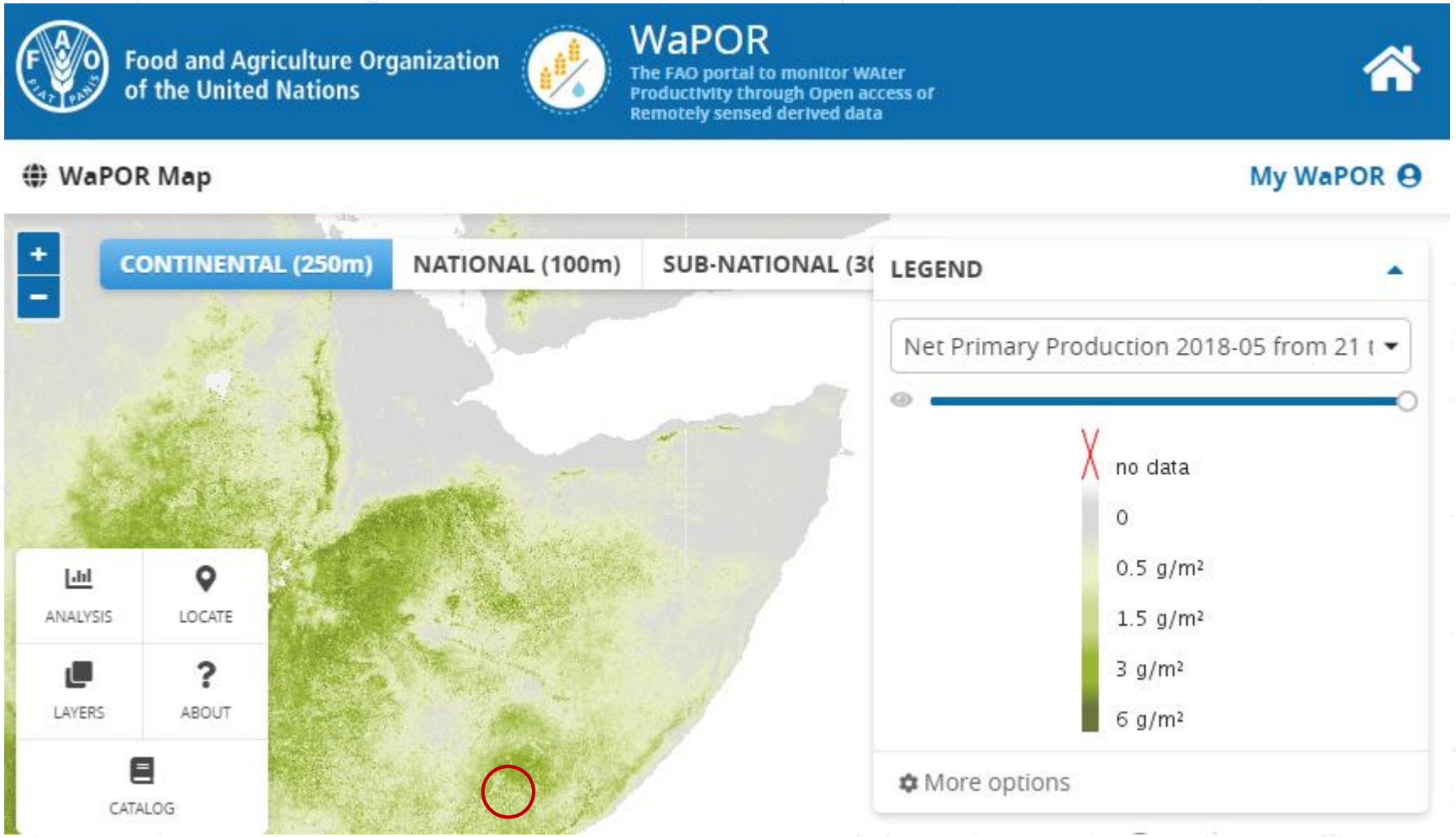
During both rain-fed and irrigation seasons the head end demonstrates more productive use of the available water

RS data supports targeting of field interventions to improve land and water productivity with farmers

Applications:

Drought impact on current growing season – Somalia

Vegetation development in the last dekad of May 2018 and May 2022



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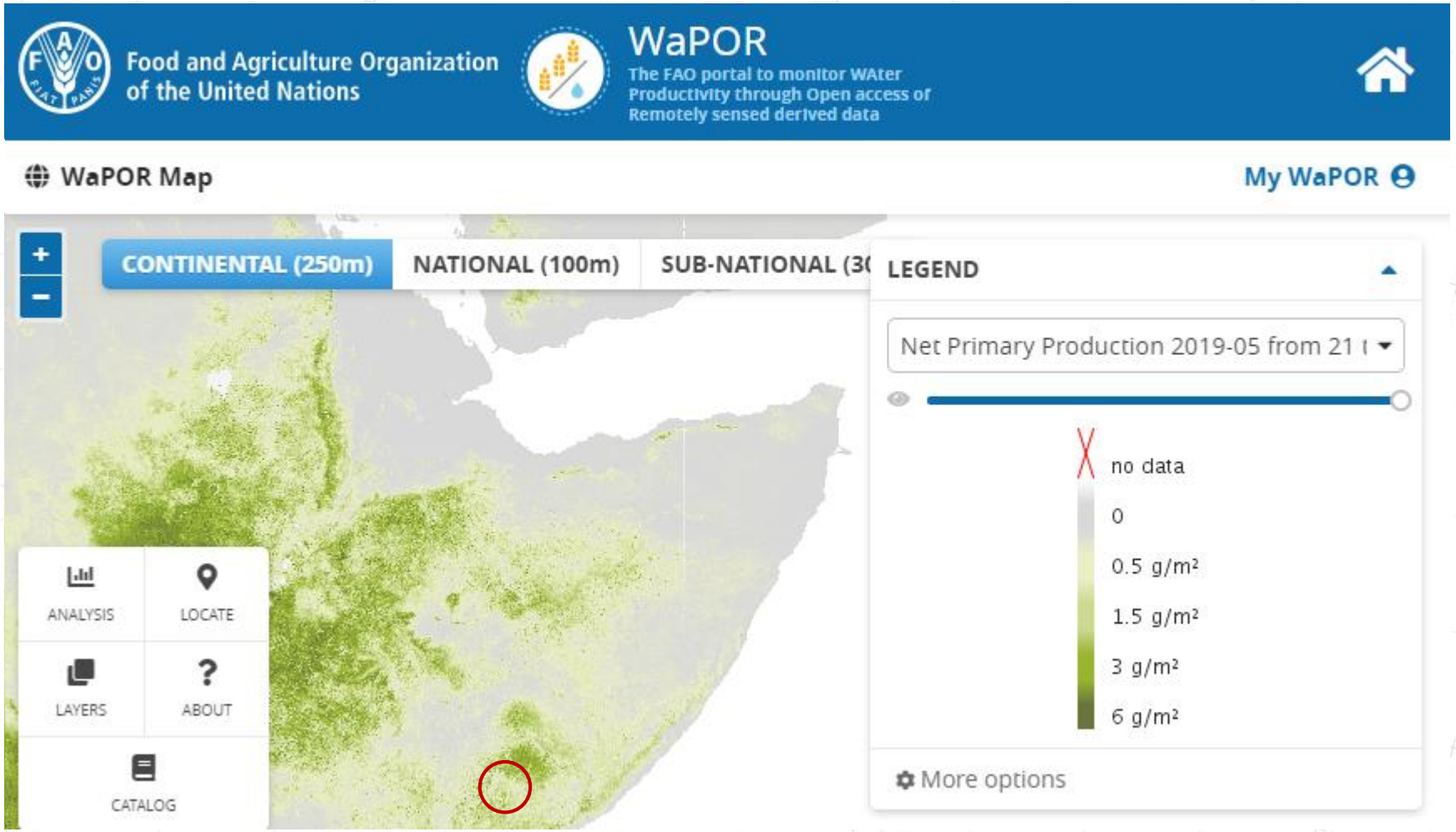

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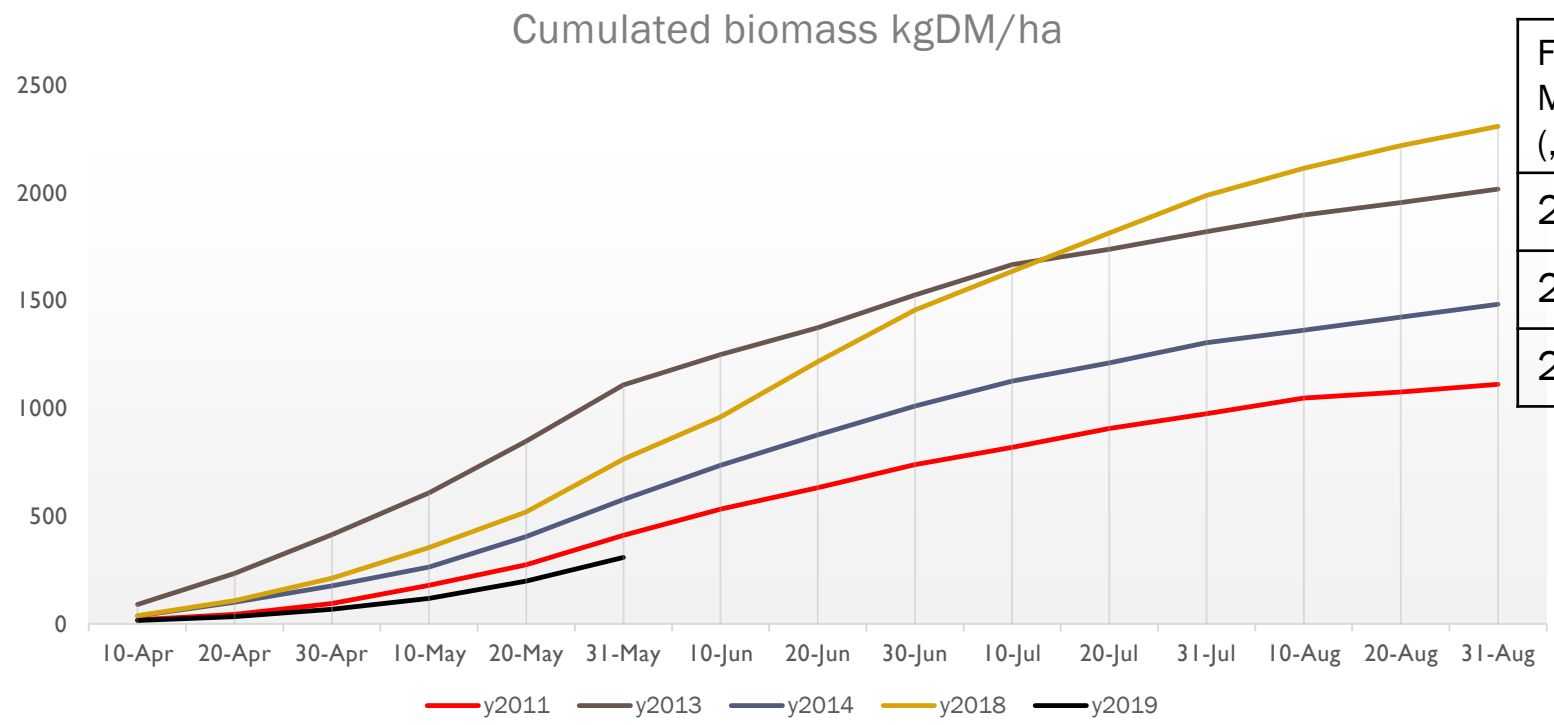


FAOSTAT national Maize + Sorghum (,000 tonnes)
2013 (380)
2014 (-36%)
2011 (-70%)

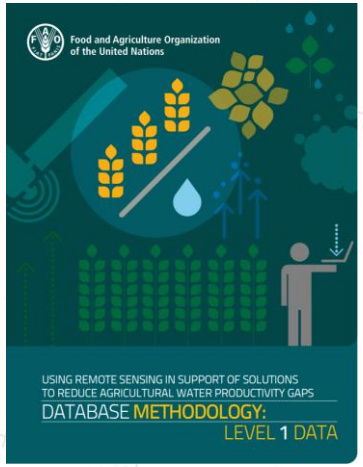
Applications

There is a wide range of applications of WaPOR data that go beyond water productivity.

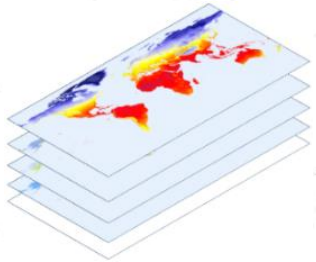
ICT-based solution (app) for irrigation scheduling advice

IRWI app helps Egyptian farmers know:

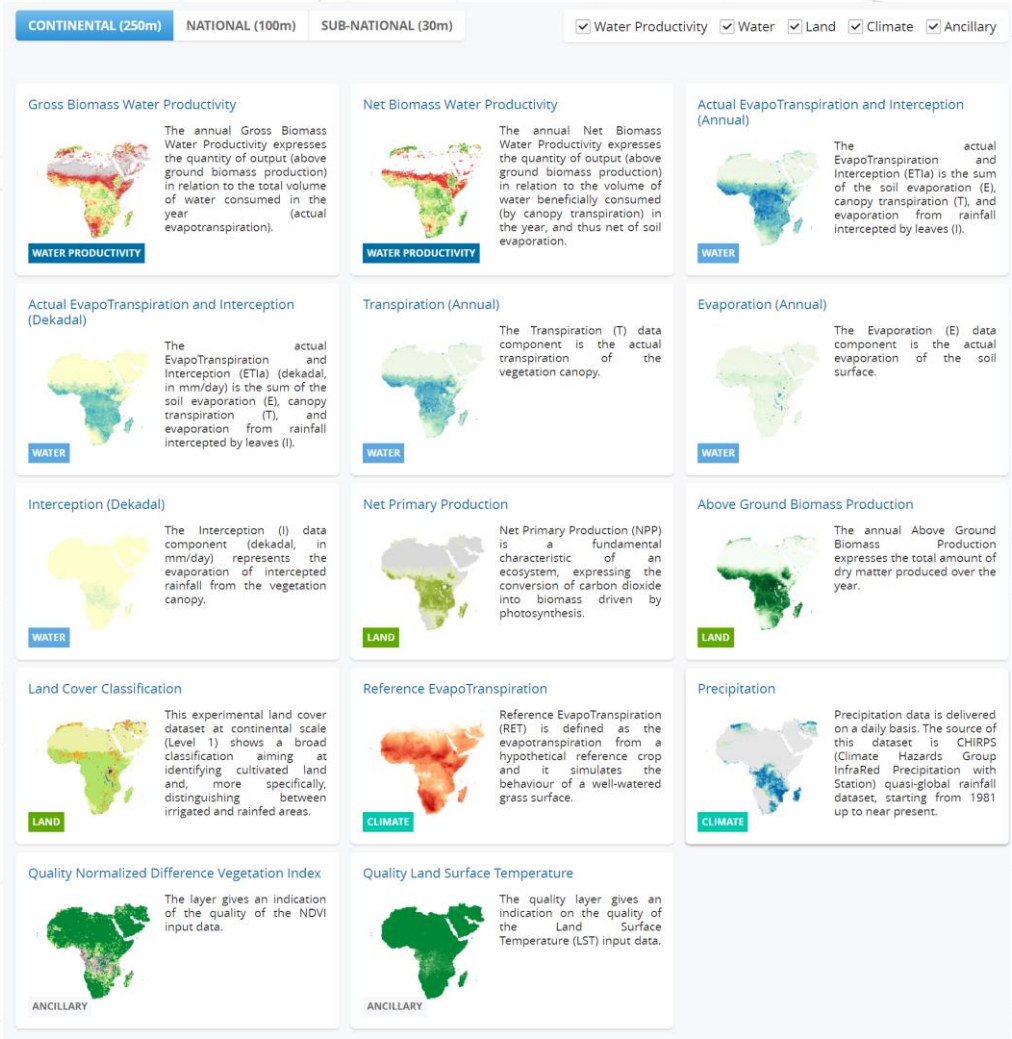
- how much water is required so that they can decide when and how much to irrigate and
- how healthy is the crop and predicted yield during the season.



- Methodology and underlying algorithms available;



- Data and metadata available through ReST APIs.



AQUASTAT – FAO's (and UN-Water's) Global information system on Water Resources and their use – Core database for "Hand in Hand Initiative";

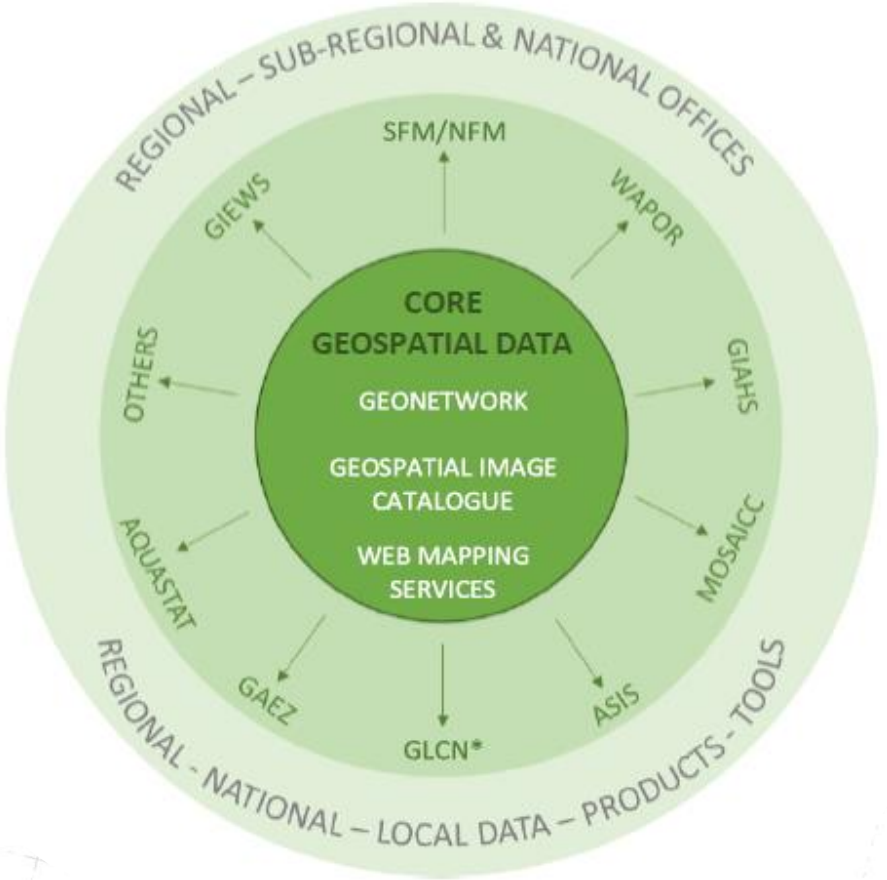
AQUAMAPS – GeoSpatial component of AQUASTAT

SoLaWISe – Soil, Land, and Water Information System

WaPOR – FAO's portal to monitor Water Productivity through Open access of Remotely Sensed data;

Integrated Monitoring Initiative – UN-Water's programme to monitor progress towards SDG 6, the Water SDG;

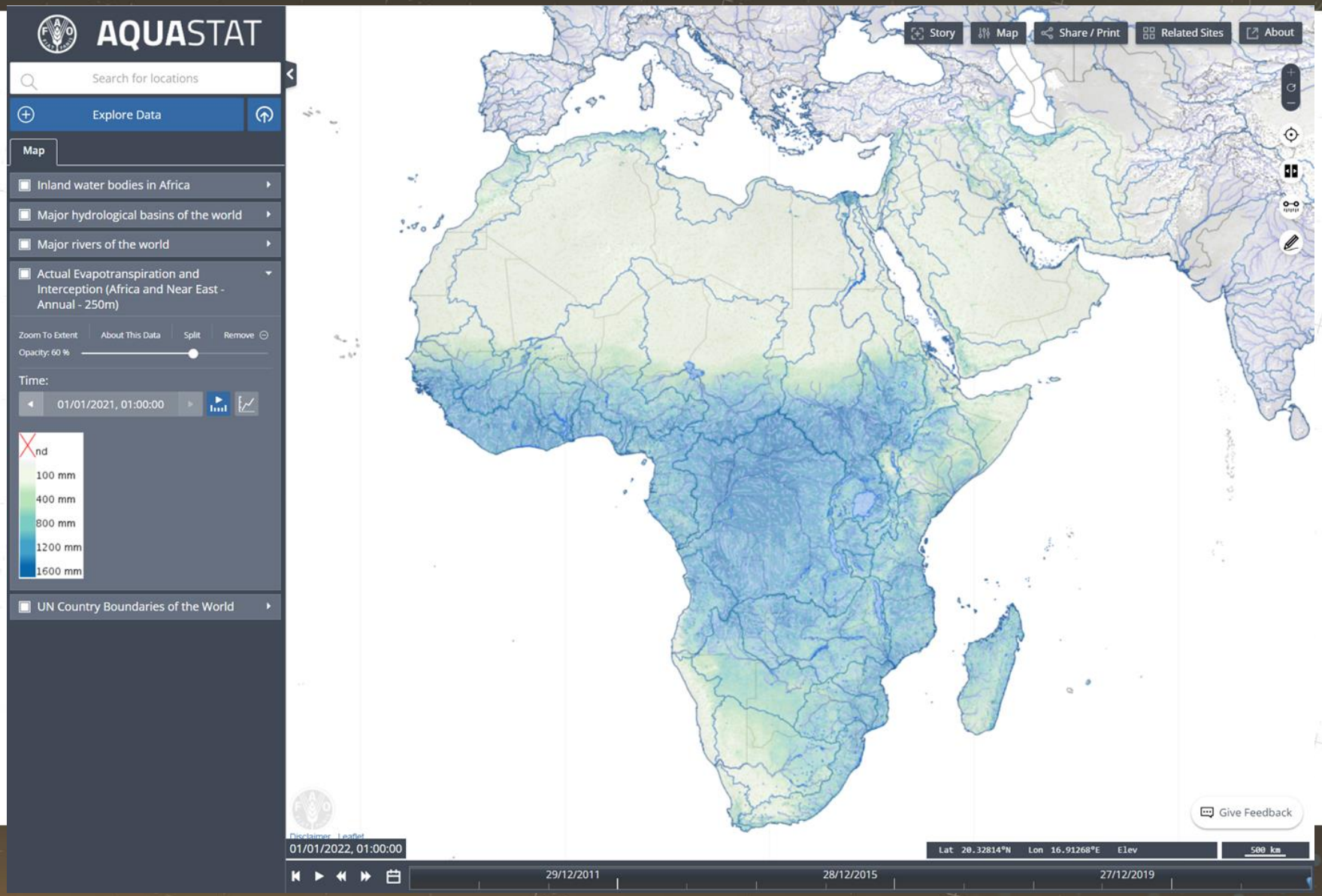
Hand-in-Hand Geospatial Platform



Food and Agriculture Organization of the United Nations

COUNTING CROPS + DROPS:
LET'S GROW THE FUTURE TOGETHER

@FAOWATER



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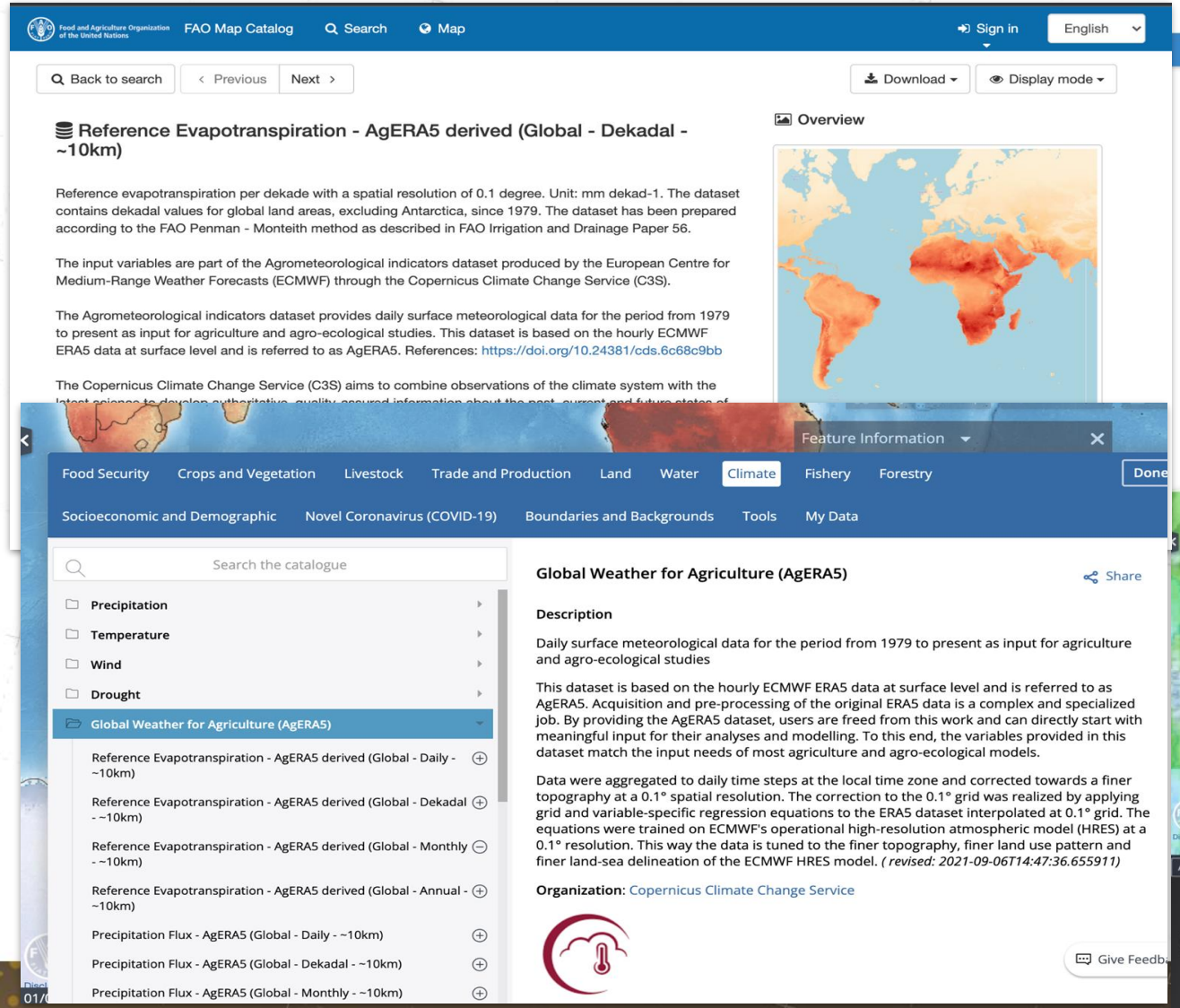

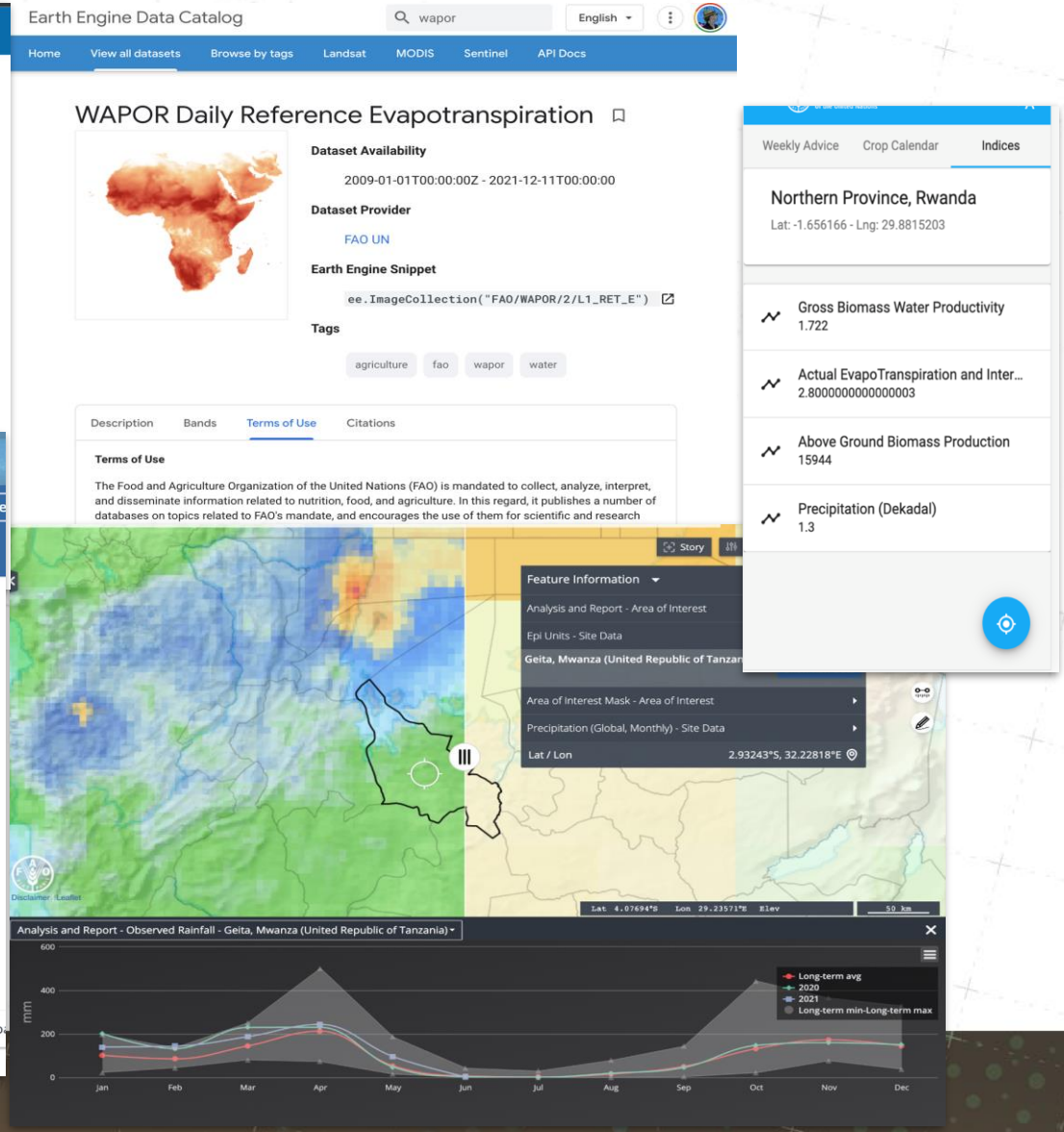

Conclusions

- Open source and open access methodologies allow fexibility on spatial and temporal resolution;

- Usable for different types of stakeholders:
  - policy makers for example to monitor progress towards SDG6.4,
  - science community,
  - water users associations,
  - extension services
  - farmers,
  - private sector

Thank you !

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