Food and Agriculture Organization of the United Nations

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Country Pilot Improved Water Allocation for Agriculture

(Egypt)

03-10-2022

1 Country background

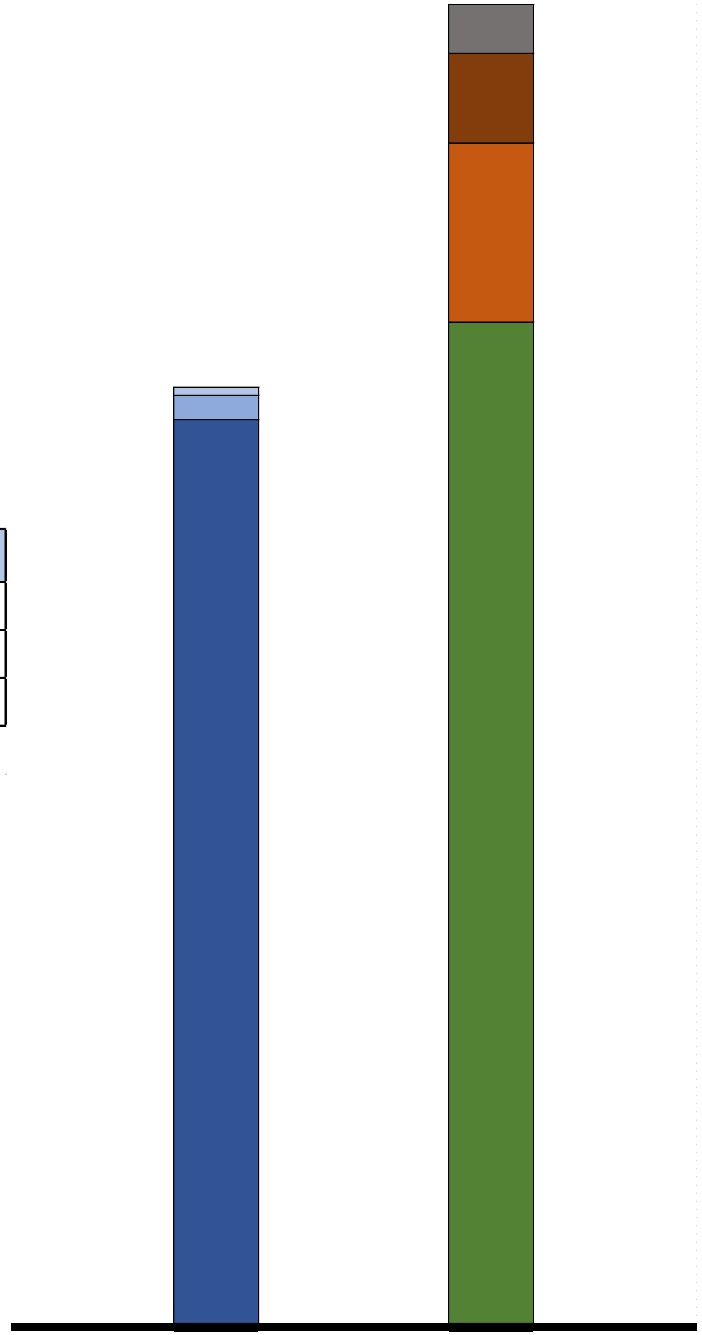
Main parameters on water resources in the country, including areas of scarcity, trends in water use and water productivity

Egypt

- 1 Million km^2
- Population > 100 M
- 2% growth rate
- 95% live on 5% of land area
- Agricultural area ~ 9.5 M feddan
- ~ 8 M feddan surface water irrigation
- ~ 1.5 M feddan groundwater irrigation

Egypt water balance

Renewable Water Resources	BCM	%
Nile	55.5	97.1
Rainfall and Flash Floods	1.3	2.3
Desalination	0.35	0.6
	57.15	

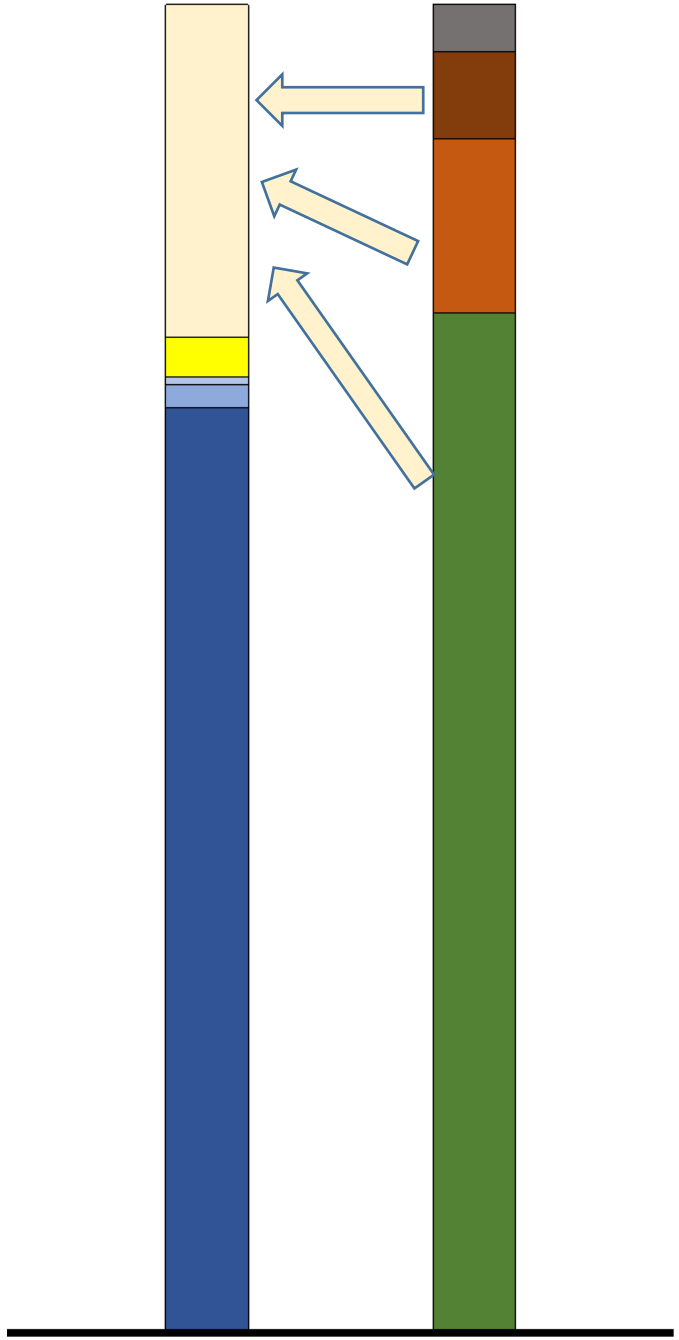


Water Demands	BCM	%
Dinking	10.7	13.3
Industry	5.4	6.7
Agriculture	61.45	76.6
Terminal Disposal + Env. Balance	2.7	3.4
	80.25	

Egypt water balance

Fresh Water Resources	BCM	%
Nile	55.5	93.1
Rainfall and Flash Floods	1.3	2.2
Desalination	0.35	0.6
Deep Groundwater	2.45	4.1
	59.6	

Water Reuse	BCM
Shallow Groundwater (Nile Aquifer)	7.15
Drainage Water Reuse	13.5
	20.65



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2 Country challenges

Main challenges in water management and water allocation for agriculture in the country

Main challenges in water management and water allocation for agriculture

- Available renewable water resources are fully utilized
- Fossil groundwater is being utilized at increasing rates (not sustainable)
- Small amounts of additional water resources are being developed at very high costs (desalination and treatment of highly polluted drainage water)
- 25% of allocated water is reused (environmental and health concerns)
- 2% annual population increase, expected population around 120M by 2030
- In case of water shortages in the future (either due to increasing demand or decrease in supply), priorities will have to be set, with agriculture expected to be the main looser
- This will have severe consequences, as more than 90% of the lands are occupied by smallholder farmers practicing subsistence agriculture

3 Proposed pilot area (1)

Reasons/ criteria to select the pilot area

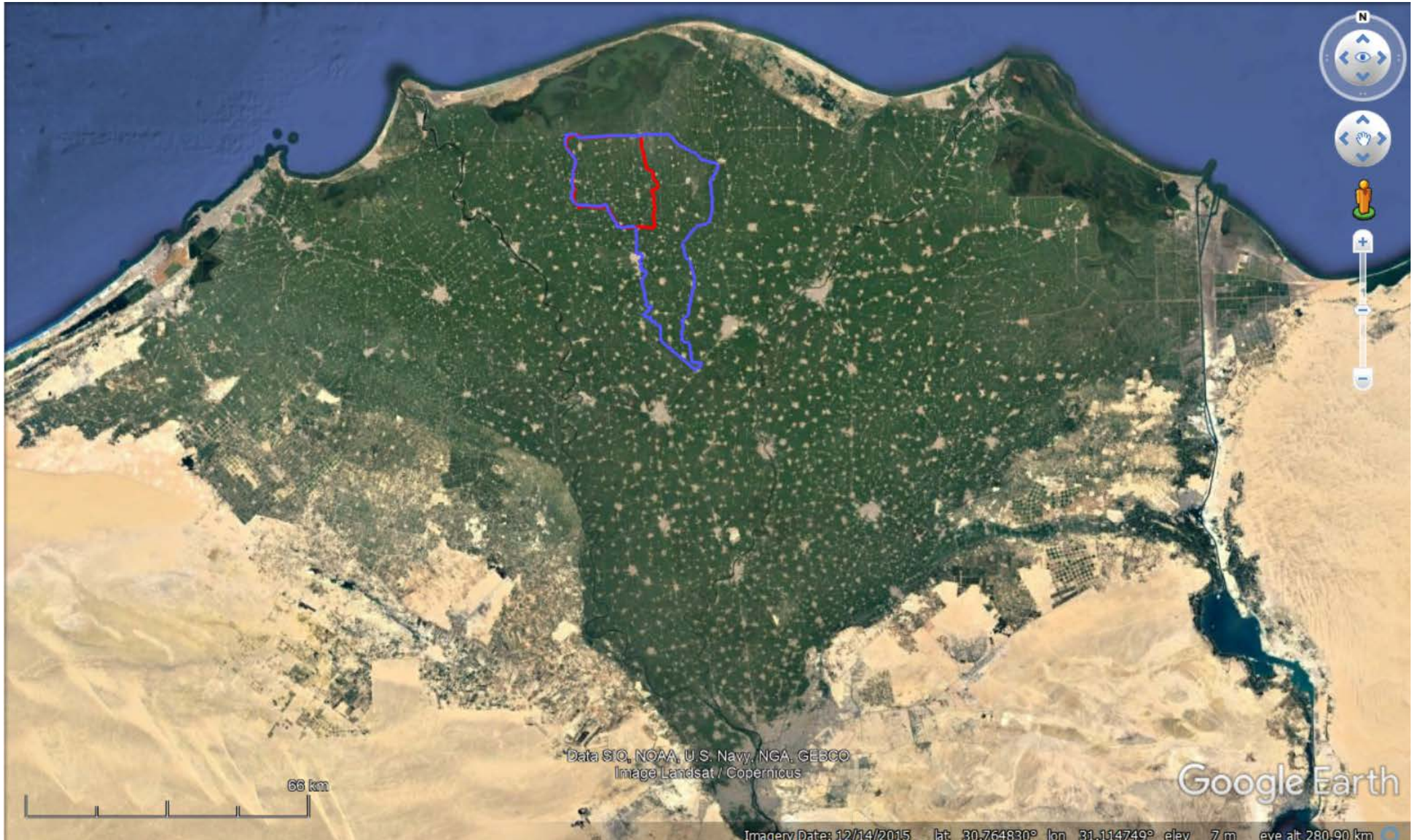
Map

1- Mit Yazid Original Proposed Command Area (185,000 feddan)

Mit Yazid

Pros	Cons
One hydraulic unit of ~185,000 fed	Relatively large and complex area
Total area improved by several projects (IIP, IIIMP) since several decades	
Data Available (numerous national and international research institutions analyzed and evaluated)	
Numerous drainage water reuse stations	
Water uses include agriculture, drinking water stations, industries	
Despite previous projects, water issues still exist	

Mit Yazid selected study area (79,000 feddan)

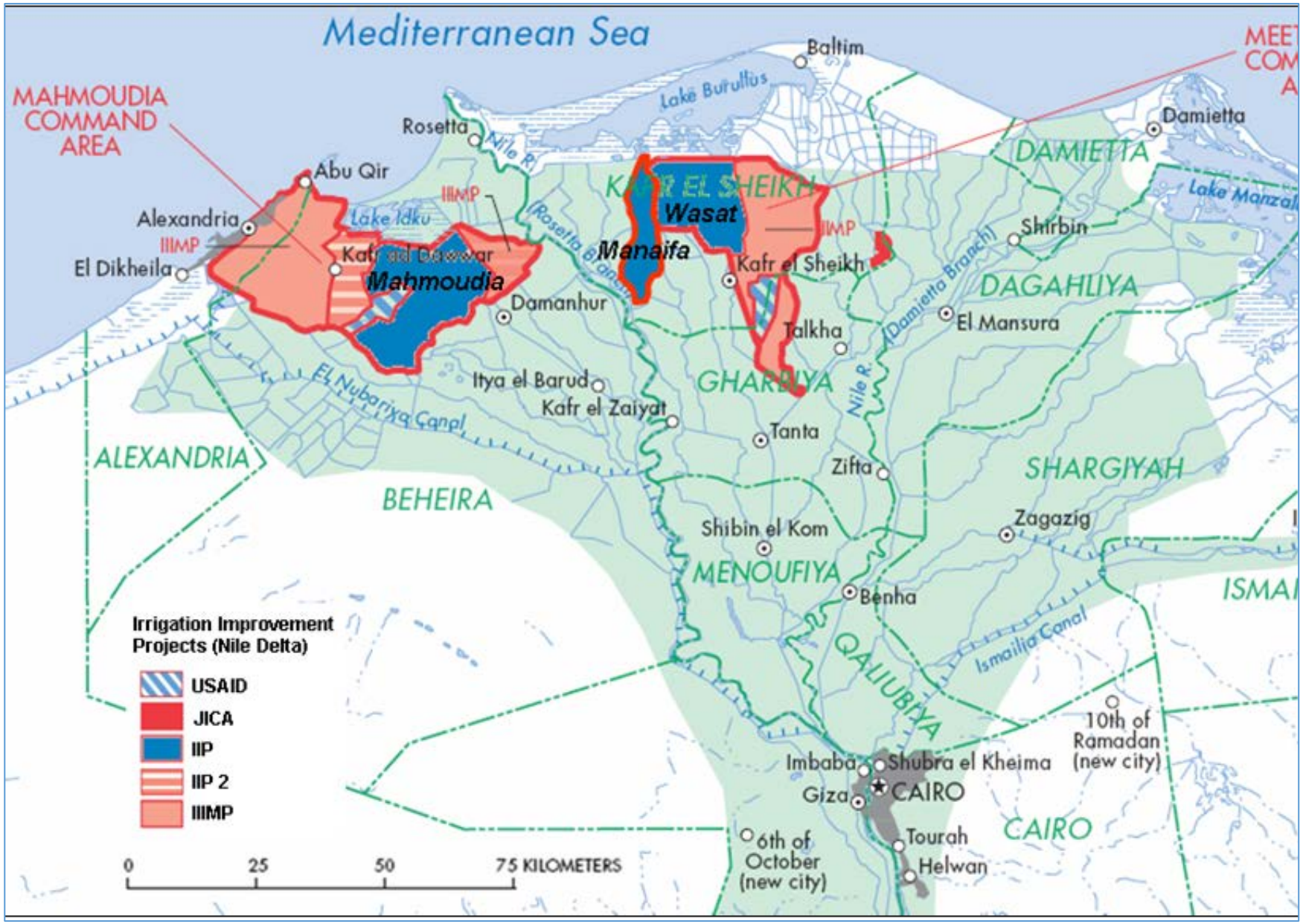


4 Proposed pilot area (2)

Description of water allocation issues

Description of main stakeholders

Irrigation Improvement Projects (IIPs) in the Nile Delta



History of IIPs

- Late 1970s Egyptian Water Use and management Project – EWUP was conducted by the Water Management Research Institute with the cooperation of some American universities: concept of Irrigation Improvement Project was set
- After that:
  - Regional Irrigation Improvement Project (RIIP)
  - UNDP IIP
  - USAID IIP
- The main objectives of IIPs were to **improve the water use efficiency** and to **enhance the equity of water distributions** between and within branch canals.
- The project introduced **new irrigation concept (continuous flow)** and new tools (downstream control structures and distributors) to achieve its targets
- Institutionally, the project established water users associations at different levels to help in water distribution.
- In addition, Marwa improvement projects have been implemented by the MALR for improving water distribution at the field level

Evaluation of IIPS

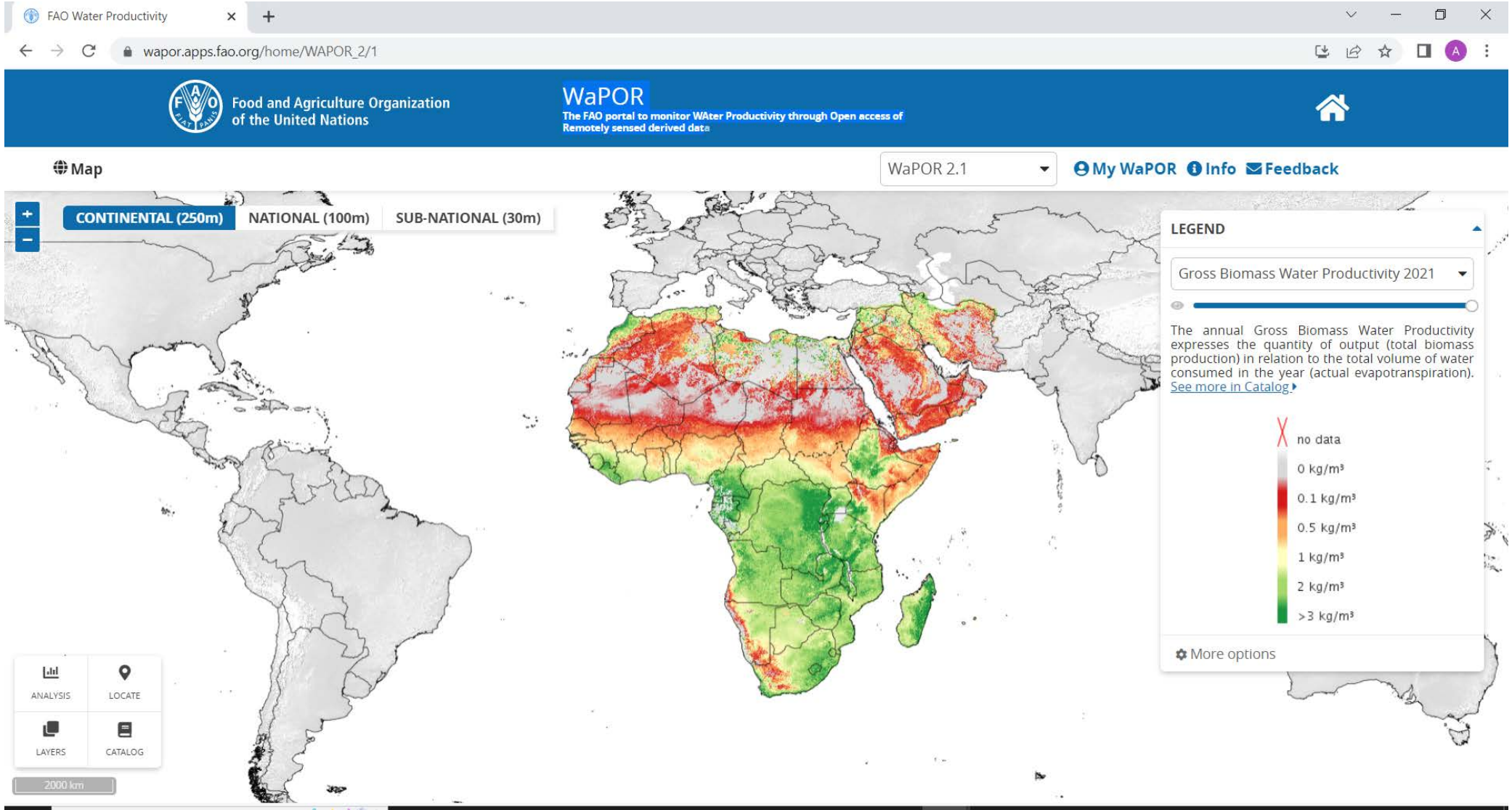
- Several evaluations were conducted by national and international entities
- Evaluation carried out by WMRI and published in 2019
- Compared between command areas of two improved and two unimproved branch canals
- Evaluation based on intensive monitoring and measurements of different operational parameters to calculate performance indicators
- Assessed indicators included:
  - Water Use Index (WUI) = water supply/water requirement
    - Water requirement = ET + 10% LR
  - Relative Water Supply (RWS) = water supply/irrigated area
- Difficulty in assessment of actual cropping pattern
- The main conclusions were that most of the targets were not achieved. The study points to the inefficient operation of the system.

Main Local Stakeholders

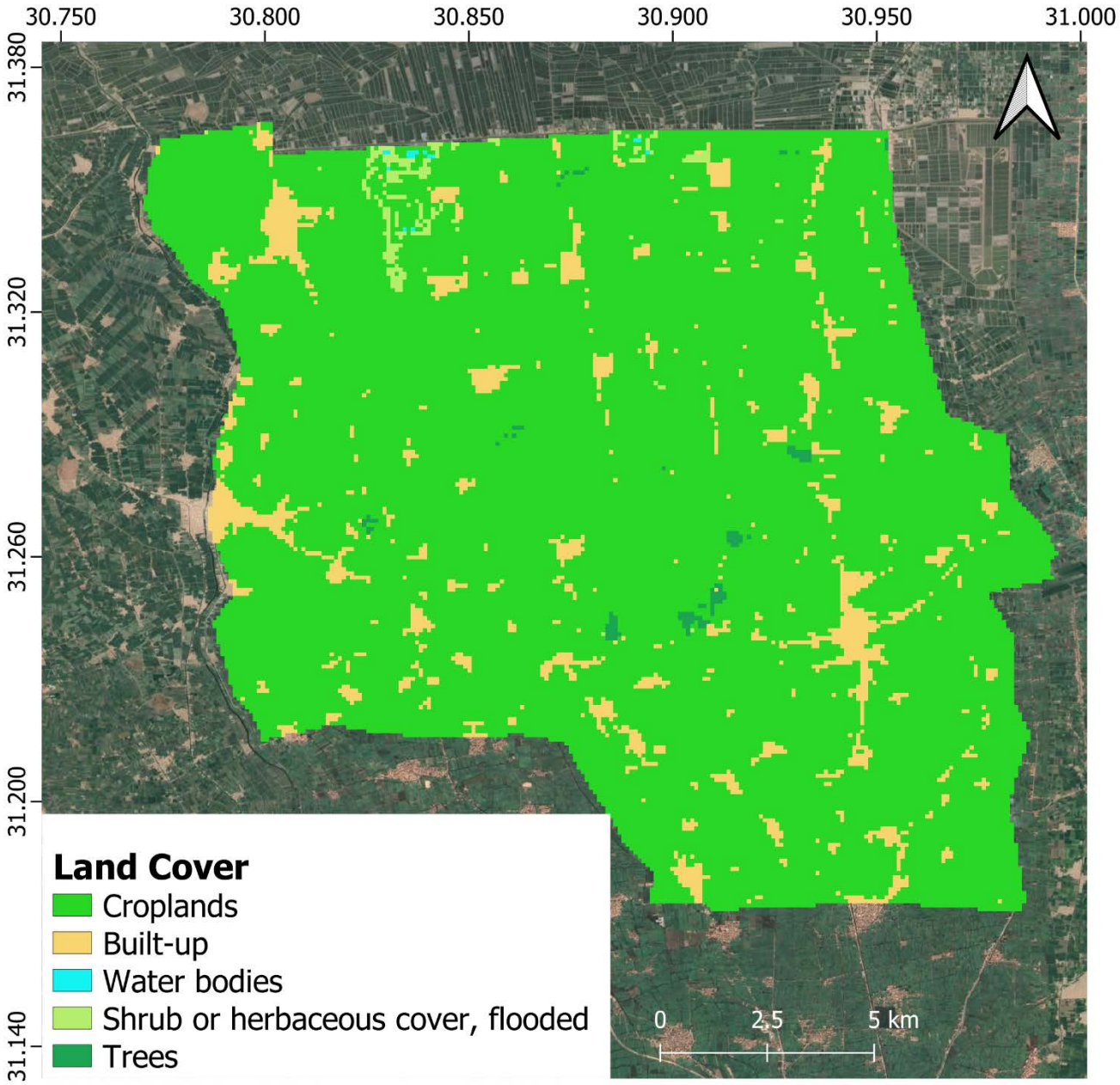
- Irrigation directorates (MWRI),
- Drainage directorates (MWRI),
- Irrigation district engineers (MWRI),
- Drainage district engineers (MWRI),
- Agricultural extension (MALR),
- Agricultural directorate (MALR),
- Land and water management (MALR)
- WUAs
- Farmers
- Other water users

FAO WaPOR

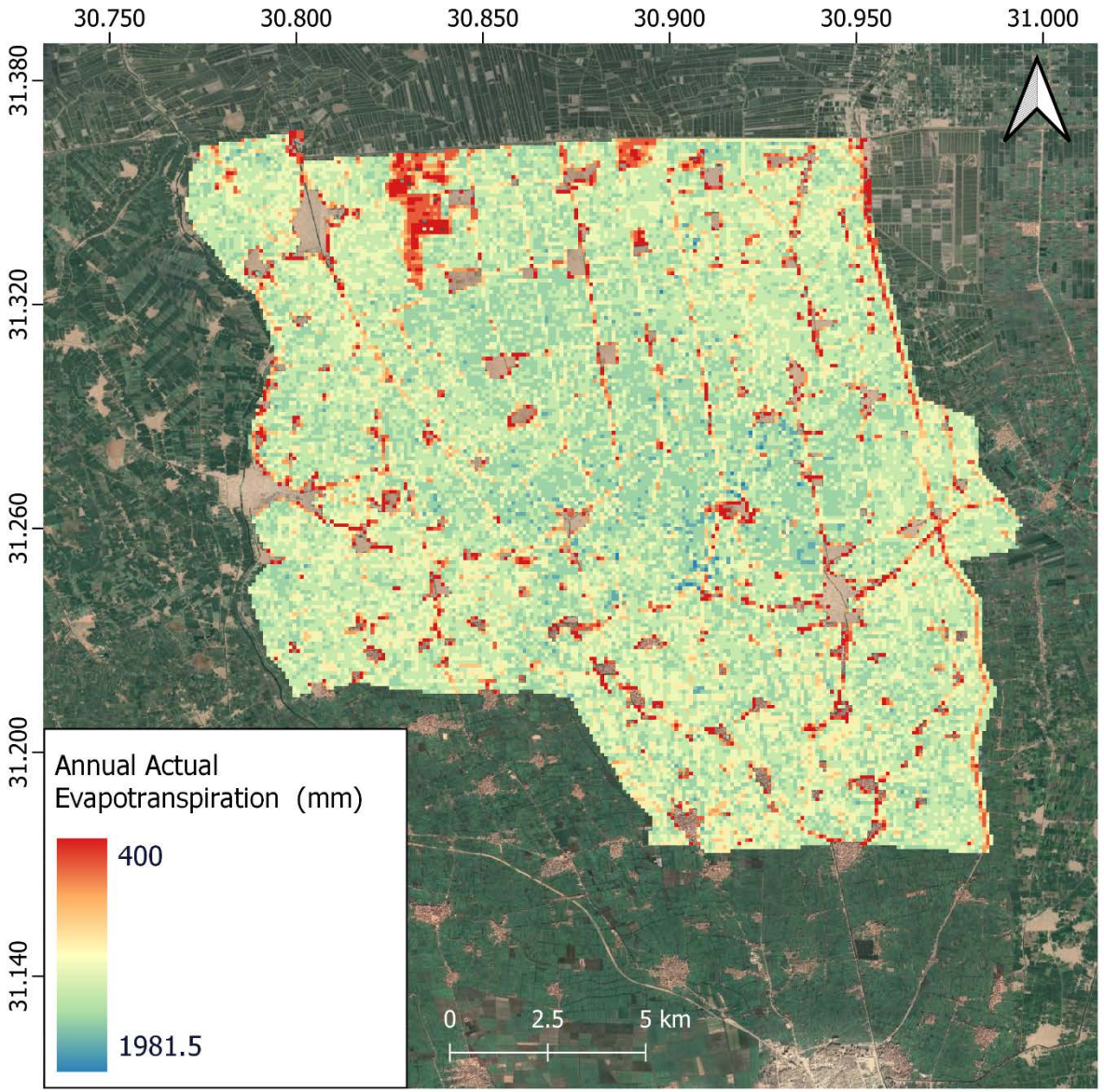
The FAO portal to monitor WAter Productivity through Open access of Remotely sensed derived data

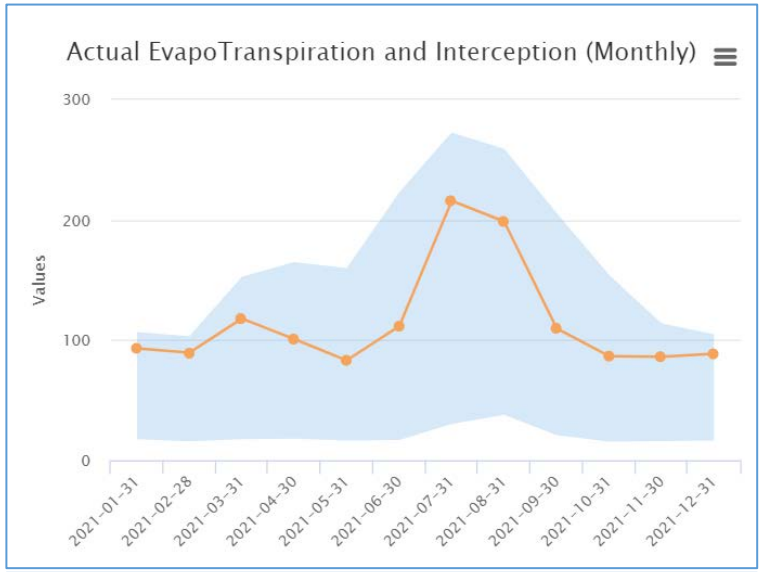


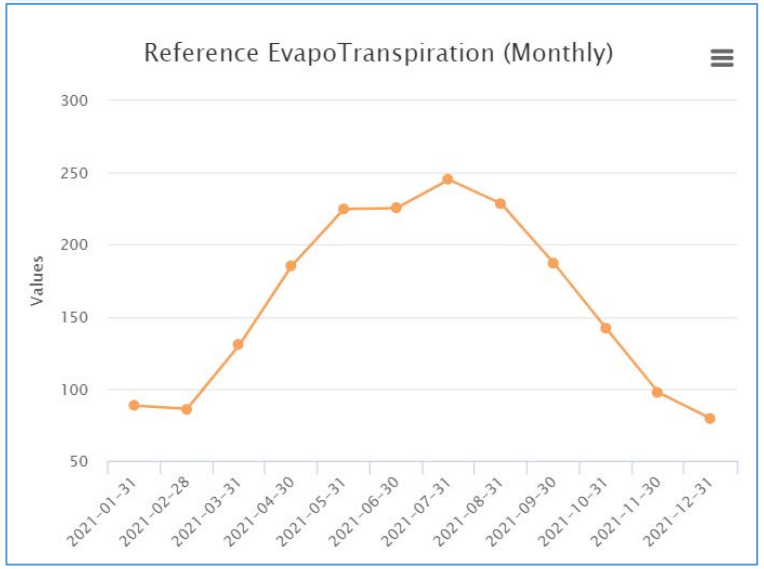
Land Use map
(100m resolution)



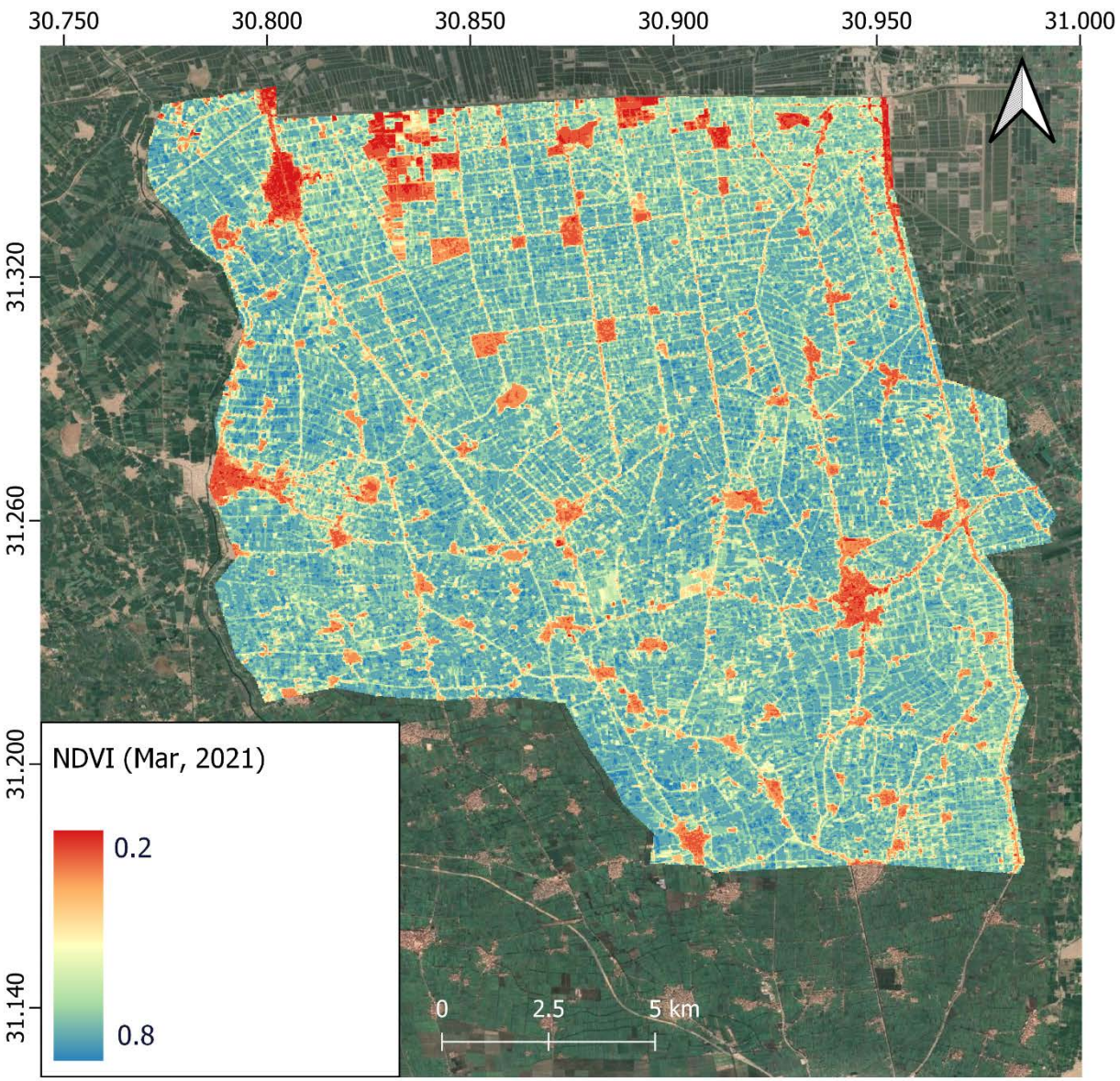
Annual Actual Evapotranspiration (100 m resolution)

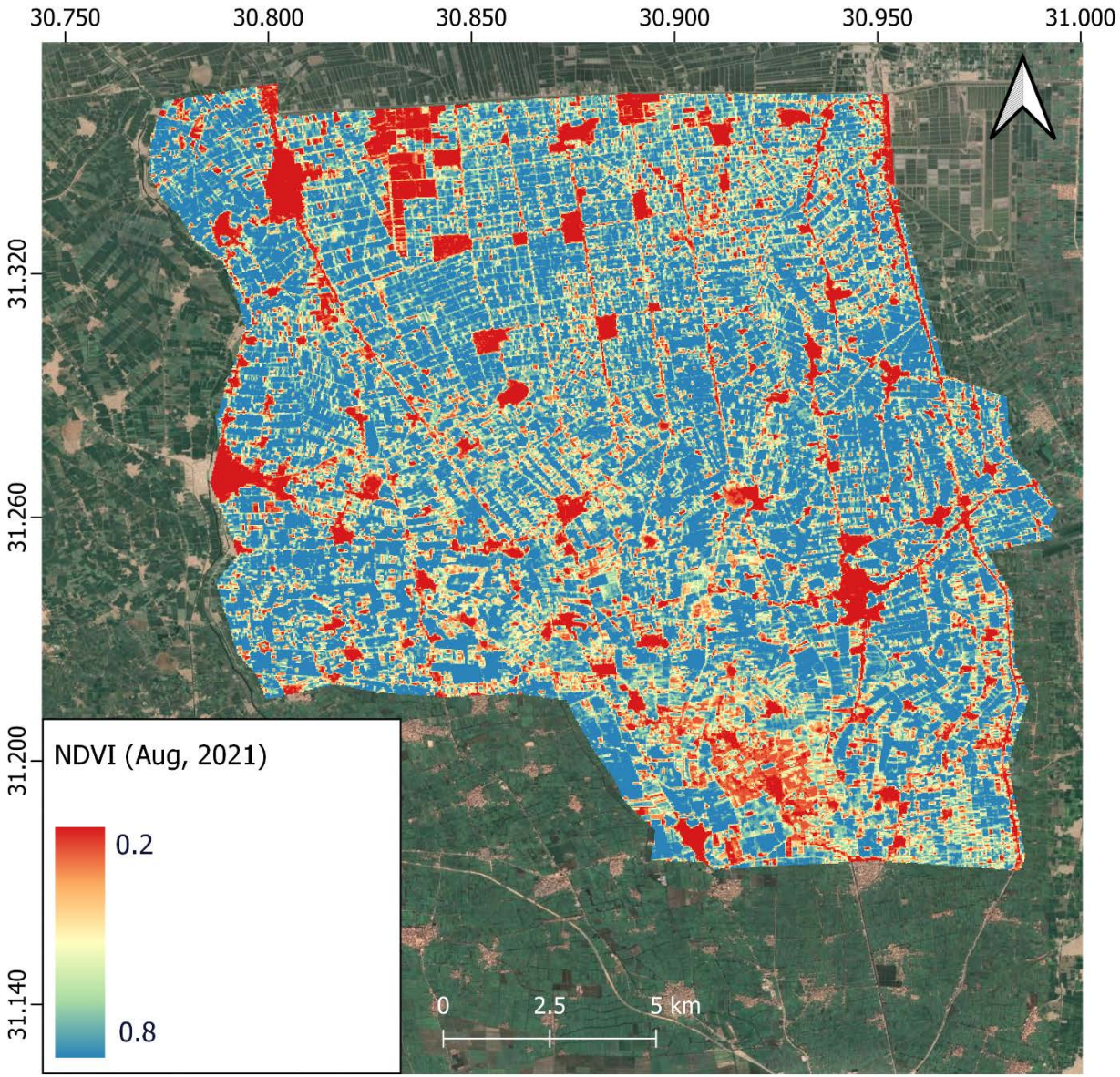




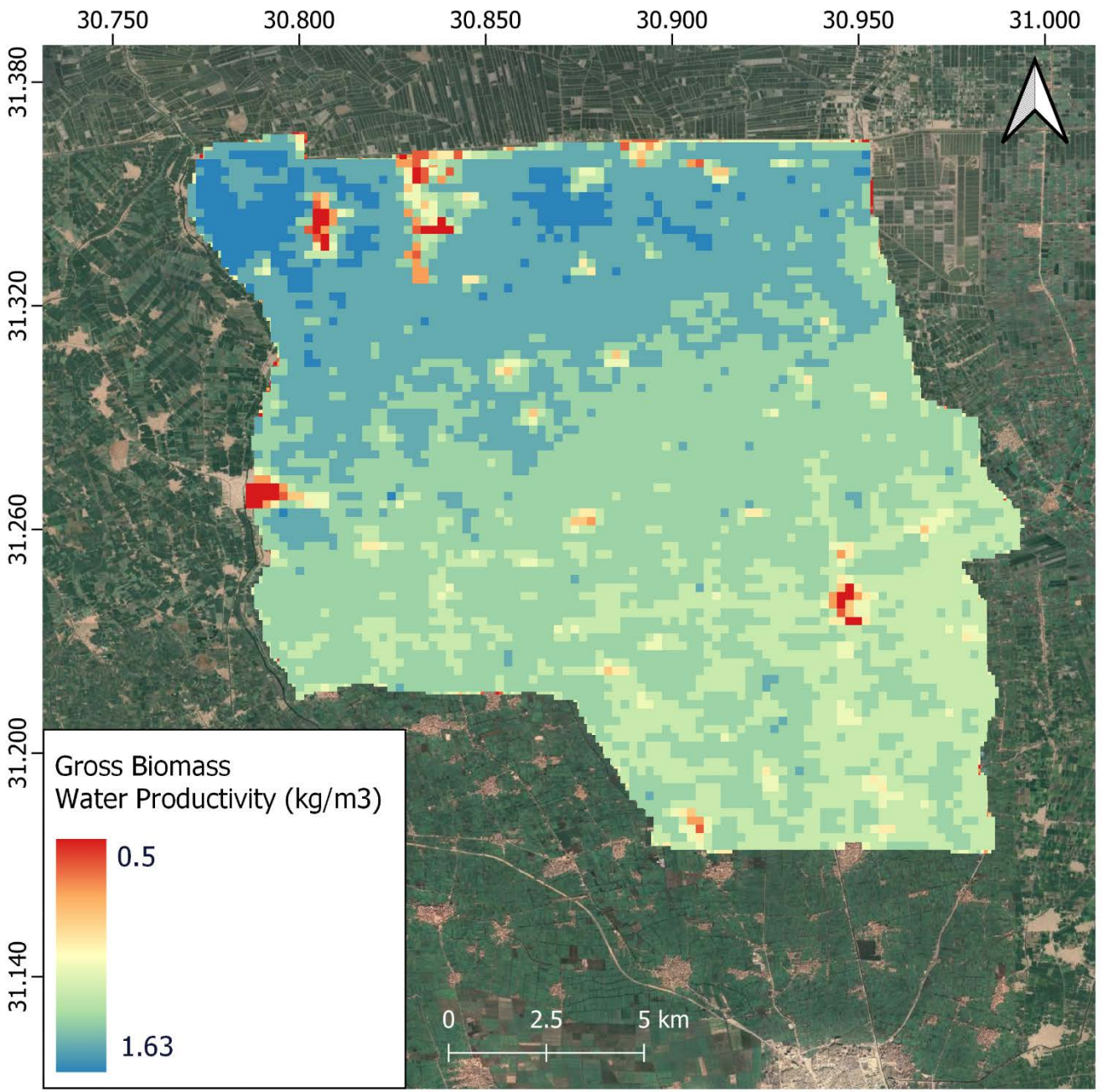


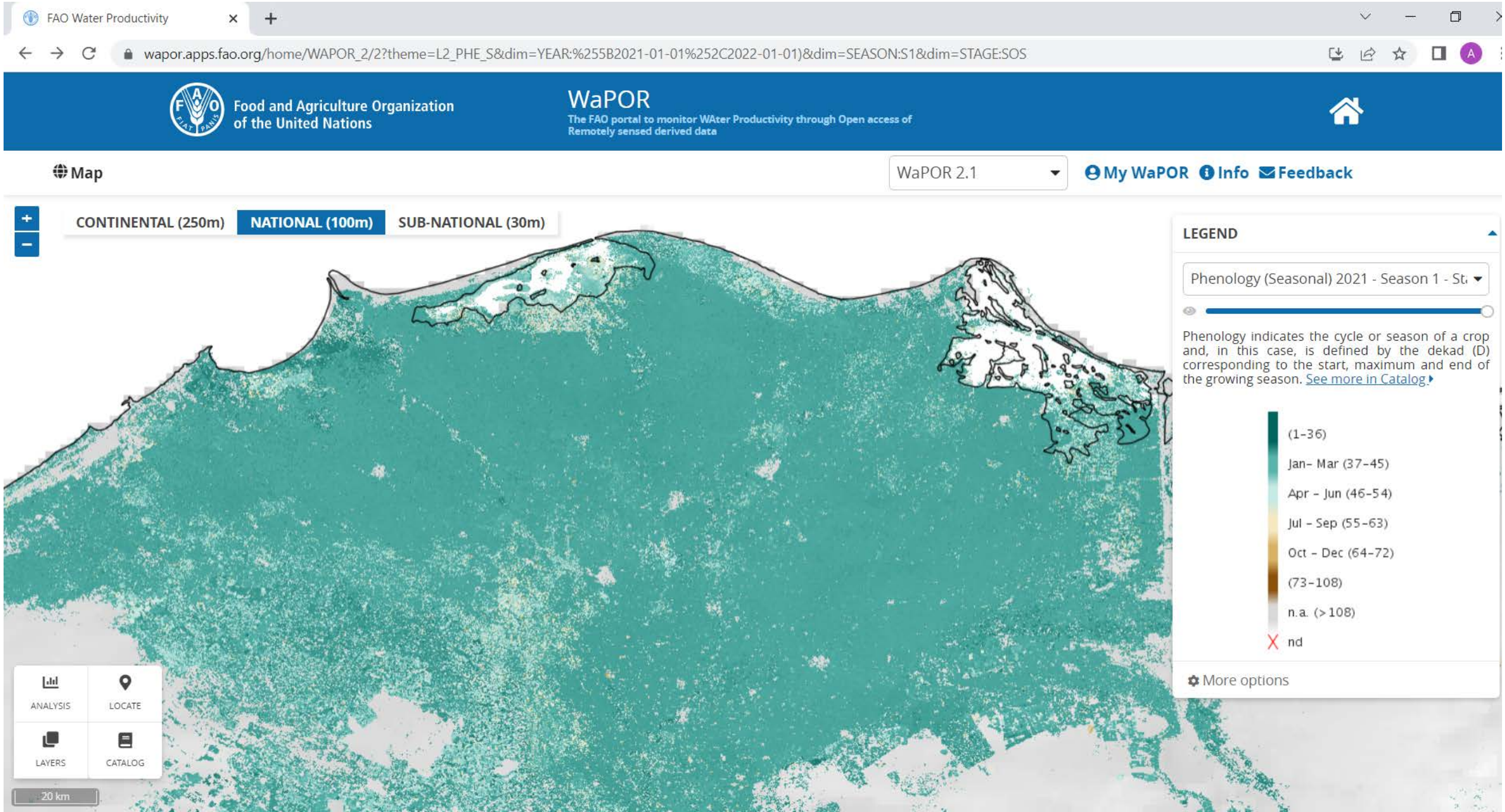
NDVI 2021 (30 m resolution)





Gross (above ground) Biomass Water Productivity during 2021 (250 m resolution)




FAO Water Productivity
wapor.apps.fao.org/home/WAPOR_2/2?theme=L2_PHE_S&dim=YEAR:%255B2021-01-01%252C2022-01-01)&dim=SEASON:S1&dim=STAGE:SOS
Food and Agriculture Organization of the United Nations
WaPOR
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Map
WaPOR 2.1
My WaPOR
Info
Feedback
CONTINENTAL (250m)
NATIONAL (100m)
SUB-NATIONAL (30m)
LEGEND
Phenology (Seasonal) 2021 - Season 1 - St
Phenology indicates the cycle or season of a crop and, in this case, is defined by the dekad (D) corresponding to the start, maximum and end of the growing season. See more in Catalog
(1-36)
Jan- Mar (37-45)
Apr - Jun (46-54)
Jul - Sep (55-63)
Oct - Dec (64-72)
(73-108)
n.a. (>108)
nd
More options
ANALYSIS
LOCATE
LAYERS
CATALOG
20 km

5 What the pilot wants to achieve?

Objectives of the pilot in terms of improved water allocation

Other objectives, such as learning, scaling, improving governance arrangements for water allocation

Pilot Objectives

- Understand the hydrology of the system (water and salt balance)
- Understand the hydraulic and institutional mechanisms for water allocation
- Assess present water allocation problems and bottlenecks
- Discuss possible solutions and interventions with stakeholders
- Review governance arrangements and legal limitations
- Identify capacity building and training needs
- Implement agreed upon interventions
- Monitor and record water allocation efficiency, complaints, problems
- Discuss with stakeholders means of improvement
- Recommend improvements to governance and institutional arrangements
- Report on lessons learned and way forward

6 Proposed activities (indicative) and timelines

Defining the water allocation improvement agenda/plan

Contacting national leaders/stakeholders

Engaging local leaders/ stakeholders

Using existing/ new studies

Assessing supporting governance arrangements

Capacity building and familiarization

Implementation and learning/monitoring

Achievements to data

- Selection of pilot area
- Collection of available reports and studies
- Meeting with the general director of the General Directorate for Water Distribution
- Meeting with the head of the Irrigation Sector:
  - Endorsement of pilot area selection
  - Instructions to the central and decentral stakeholders to cooperate in field visits arrangement and data provision

Summary work plan till end of 2022

Activities	October				November				December			
	1	2	3	4	1	2	3	4	1	2	3	4
Nomination of possible pilot area												
Review available studies and reports												
Prepare for field visits and decentral stakeholder meetings												
Meet with local stakeholders in the field												
Ministerial meeting												
Analyze collected reports, studies, data and information												
Water accounting trial												
Prepare a descriptive report for the study area												
Prepare the work plan for the next phase (2023) of the project												

Thank You

contact details