

In the Name of God

WaterPIP
Water Productivity Improvement in Practice

WaPOR 4 SEM

(WaPOR for Sustainable Ecosystem Management)

By: **Somayeh Sima**

From *RIWEM* at
Tarbiat Modares University, Iran





An overview of the WaPOR 4 SEM idea



Main challenges

- Desiccation of many wetlands in arid regions including MENA
- Inefficient and water-intensive agriculture
- The win-lose water allocation trade-off between Agriculture and the Environment in most cases

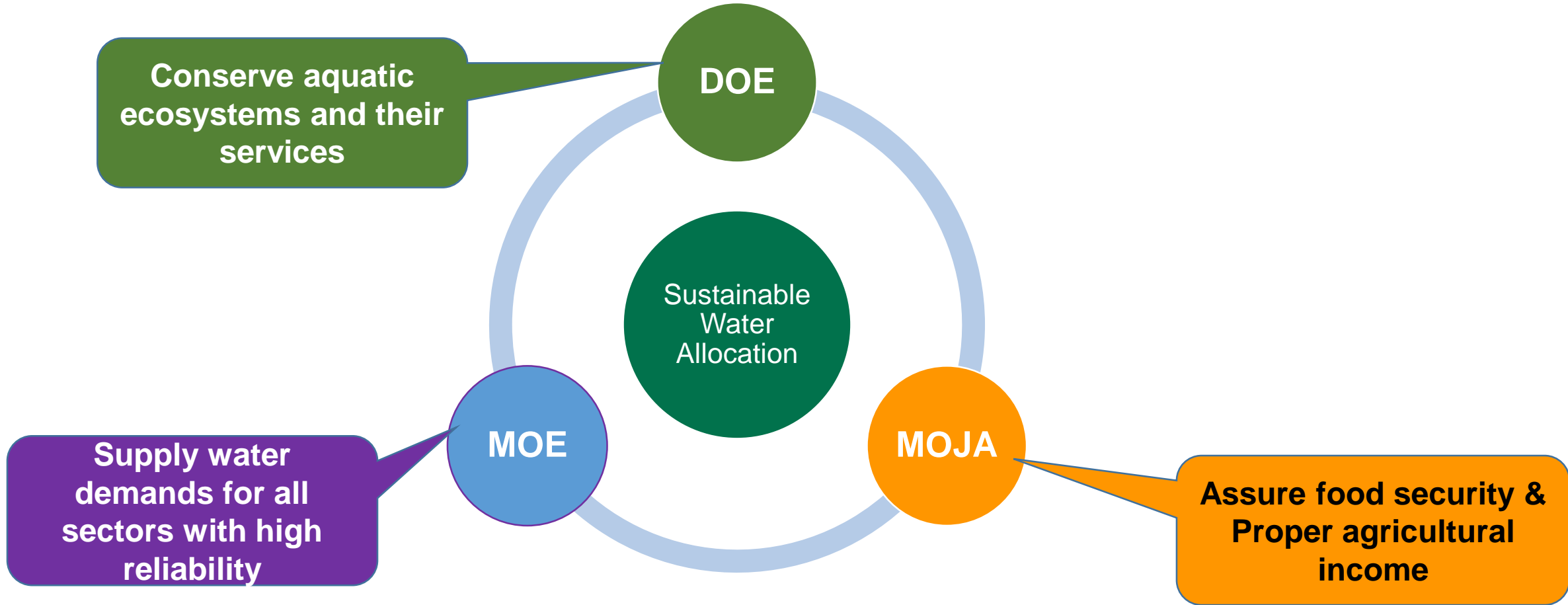




Motivation:

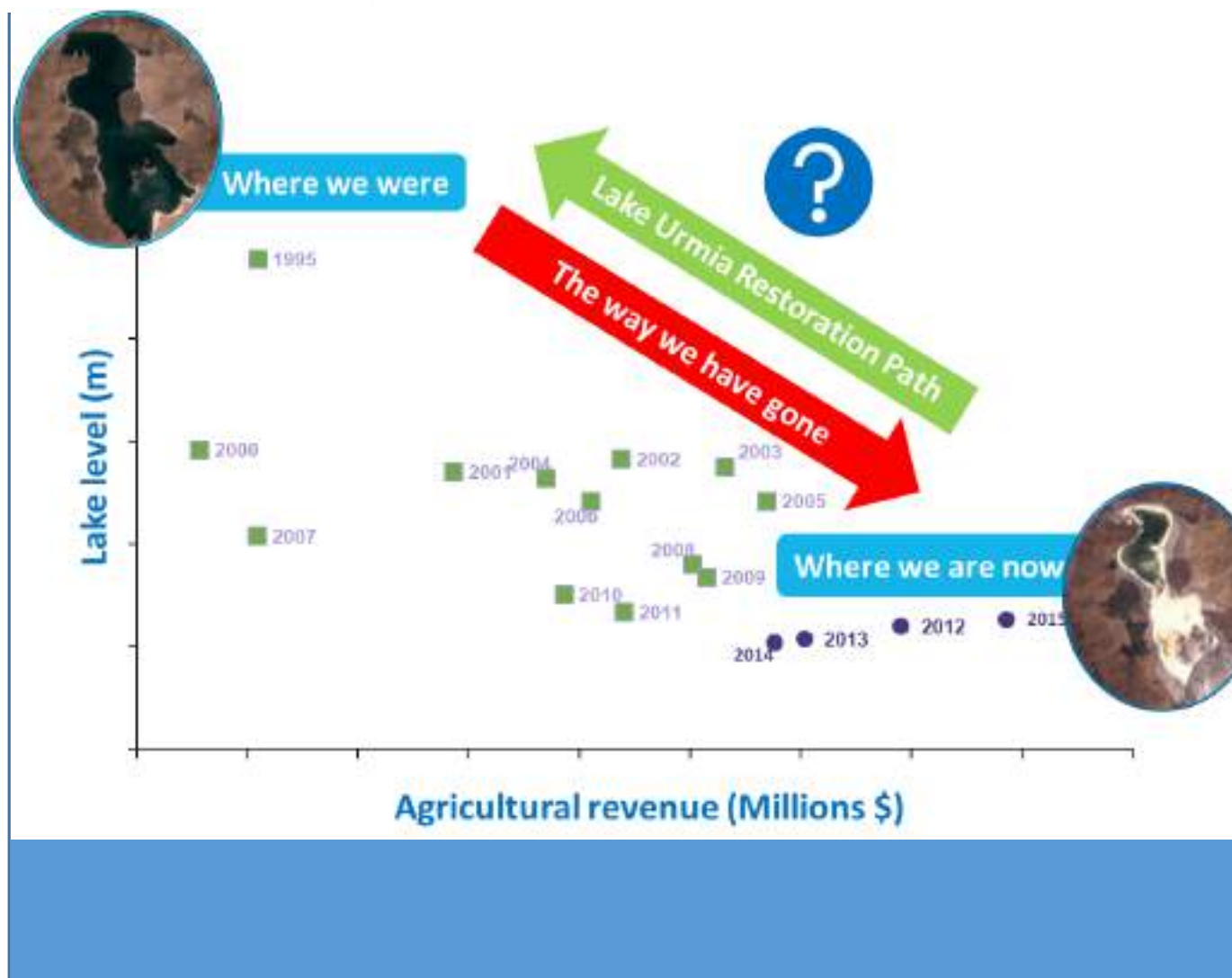
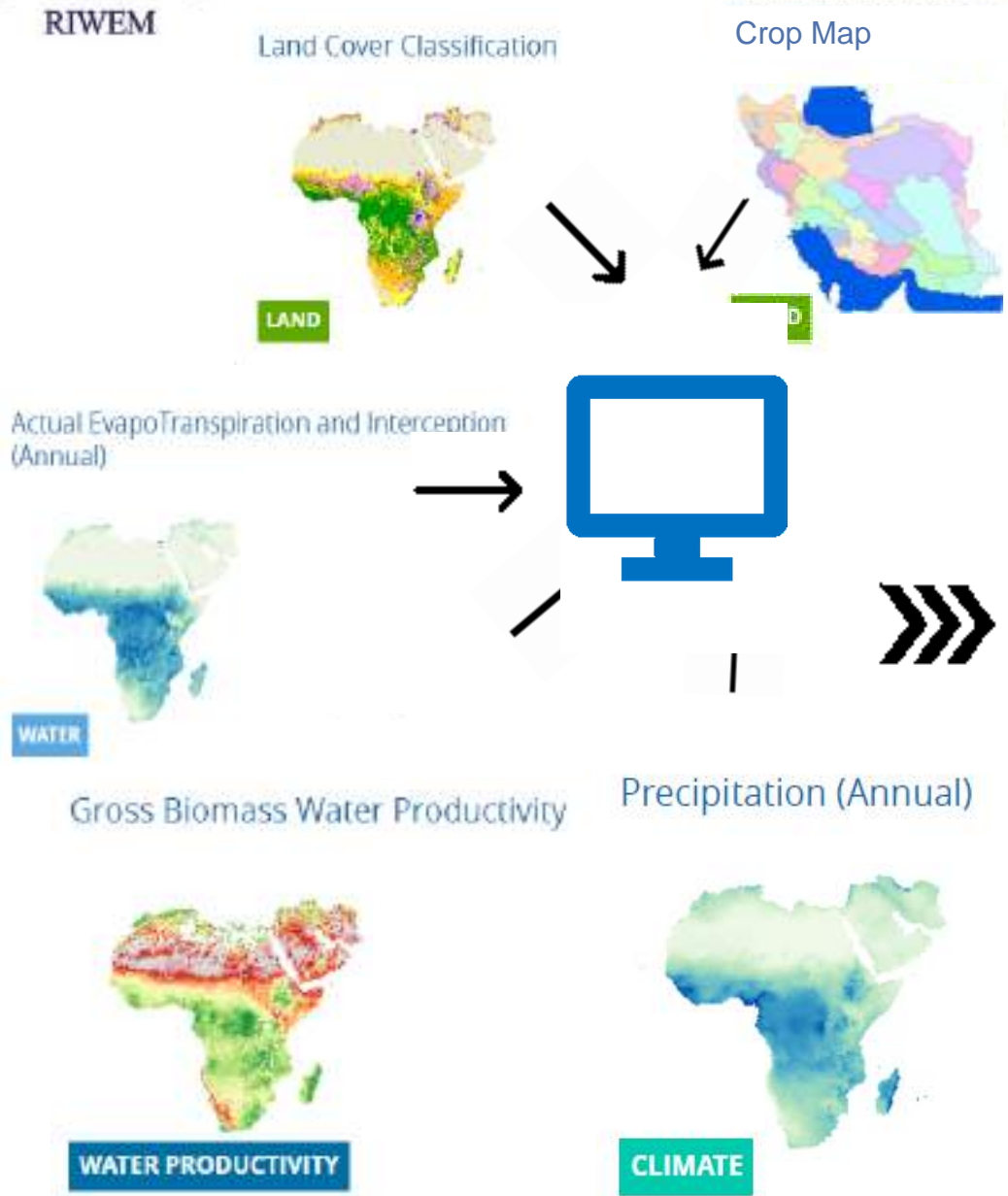


WaPOR4SEM helps a better coordination for making sustainable water allocation decisiond





An overview of the WaPOR 4 SEM idea

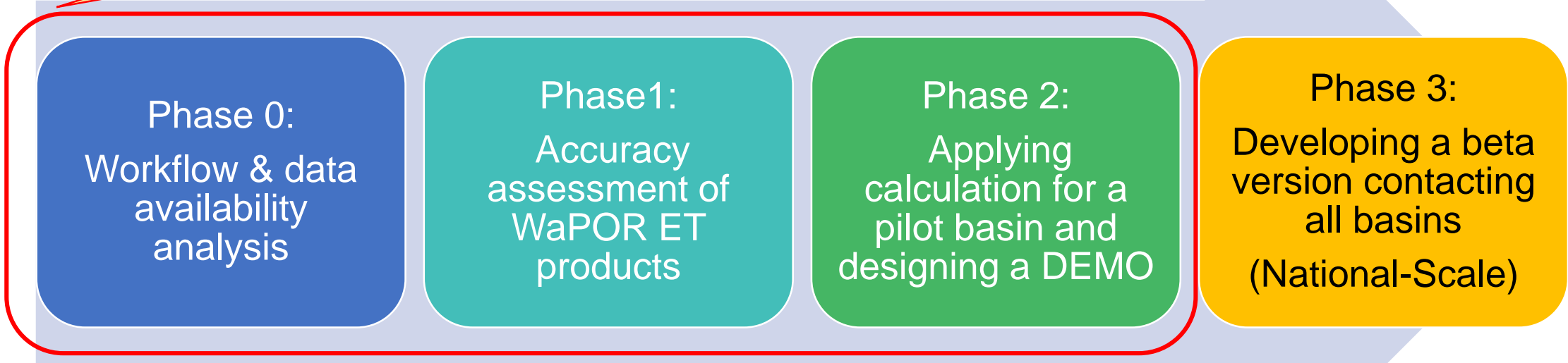




Project phases and progress



Accomplished



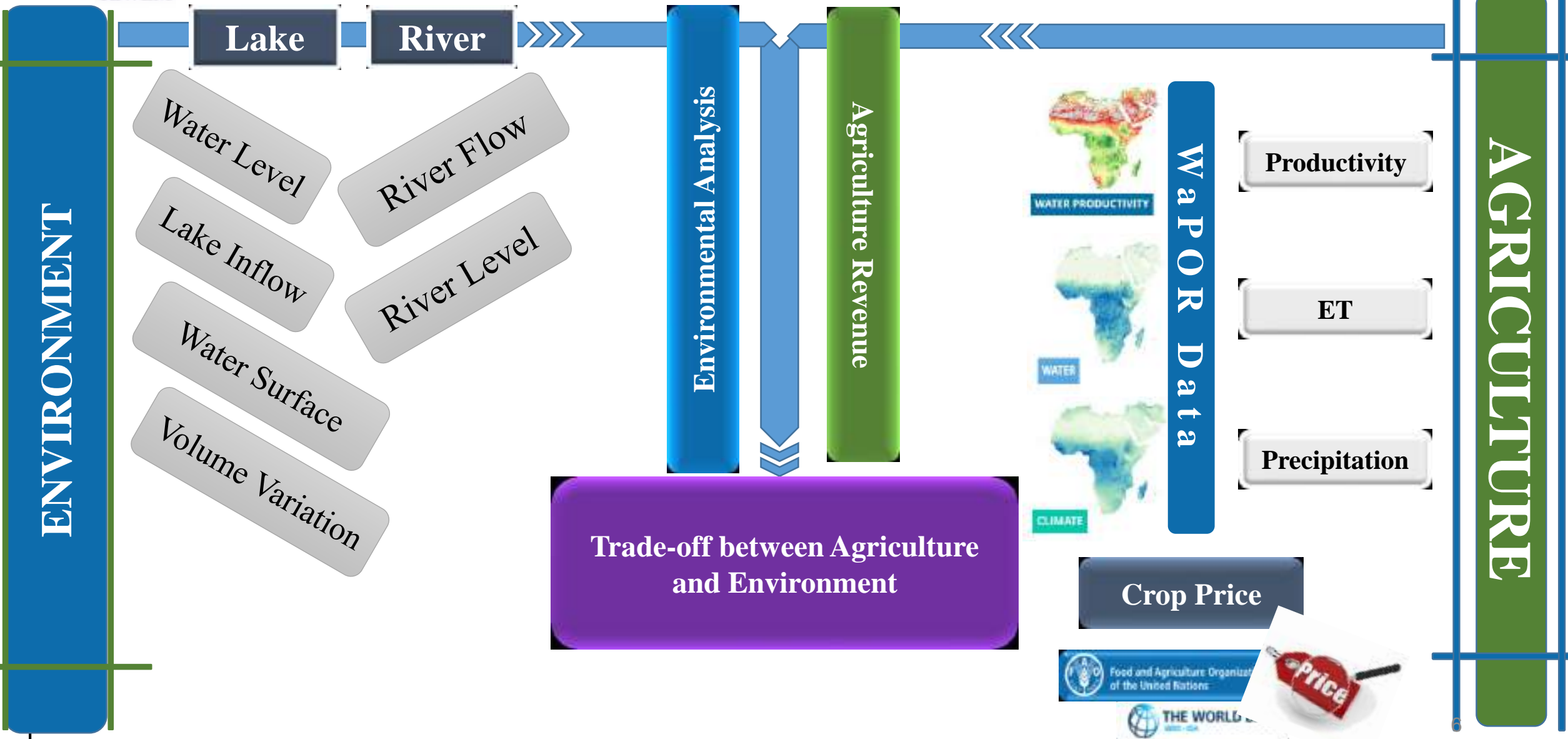
Phase 0:
Workflow & data
availability
analysis

Phase 1:
Accuracy
assessment of
WaPOR ET
products

Phase 2:
Applying
calculation for a
pilot basin and
designing a DEMO

Phase 3:
Developing a beta
version contacting
all basins
(National-Scale)

Phase 0: Workflow & data availability analysis



ENVIRONMENT

Lake

River

Water Level

River Flow

Lake Inflow

River Level

Water Surface

Volume Variation

Environmental Analysis

Agriculture Revenue

Trade-off between Agriculture and Environment

WaPOR Data



Productivity

ET

Precipitation

Crop Price



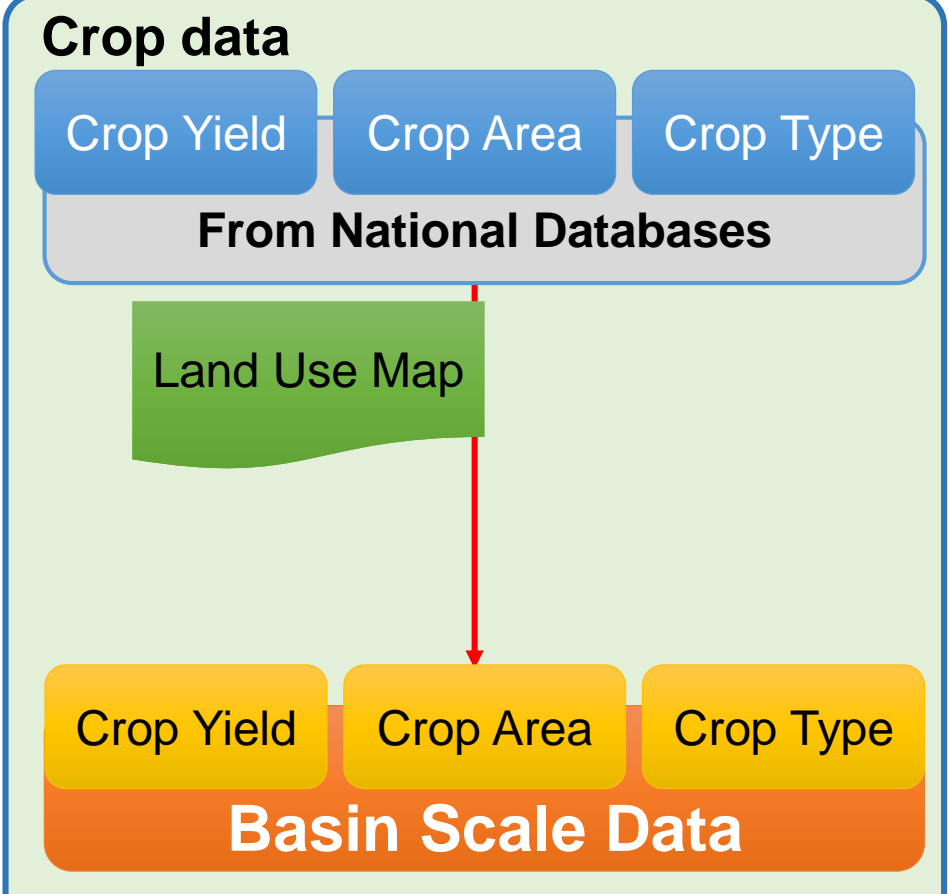
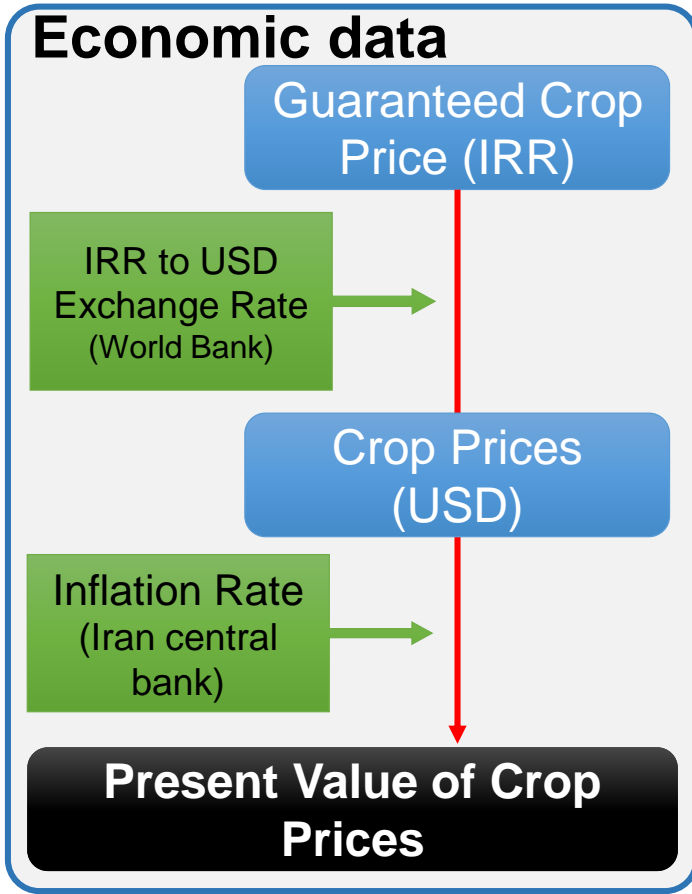
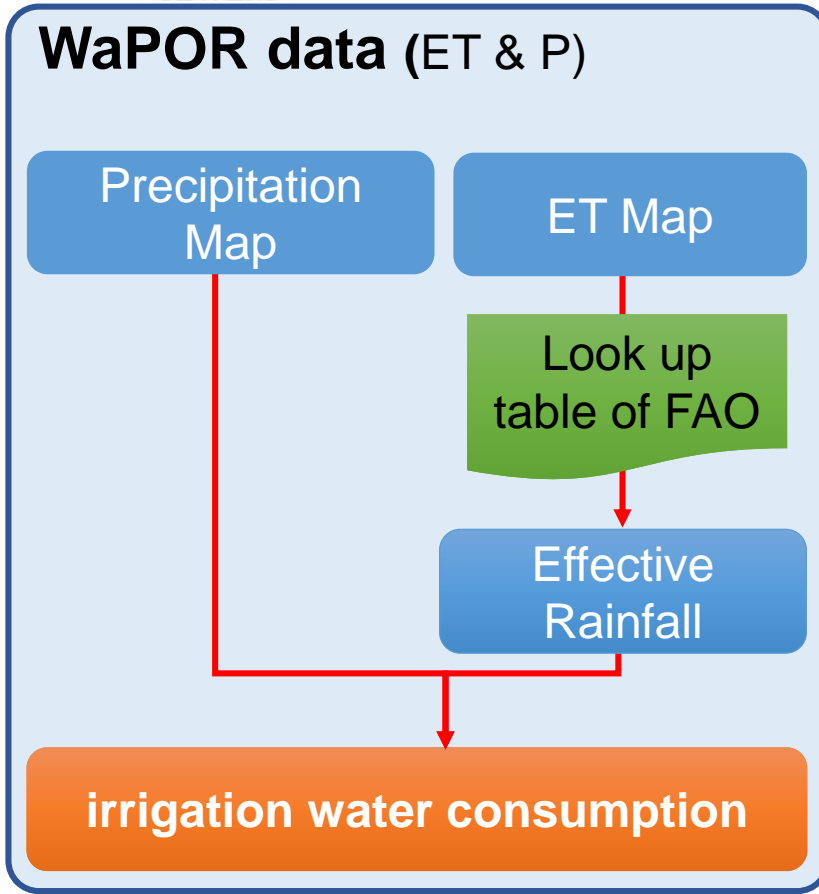
AGRICULTURE



Phase 0: Workflow & data availability analysis

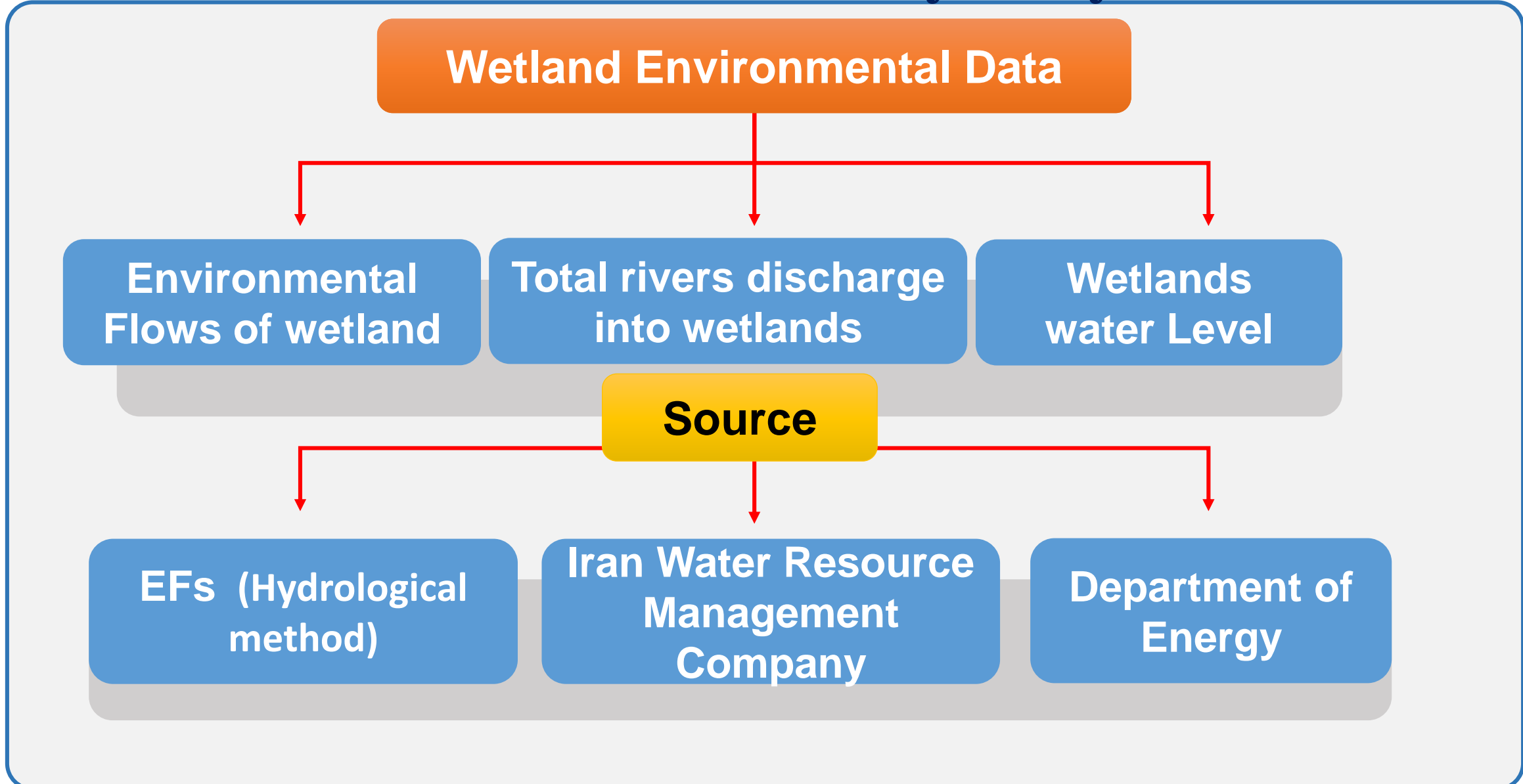


Agro-economic analysis





Phase 0: Workflow & data availability analysis





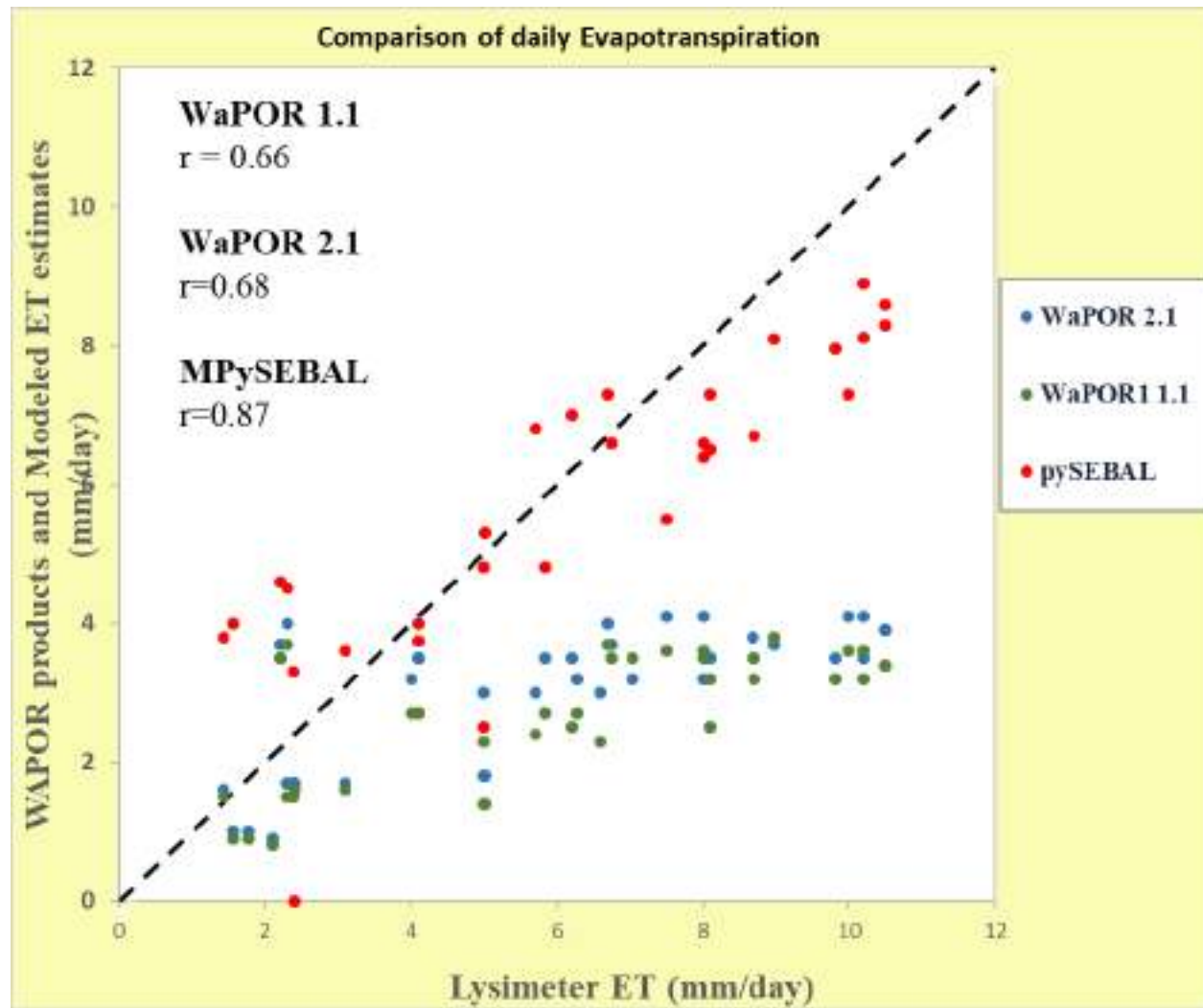
Phase 0: Workflow & data availability analysis



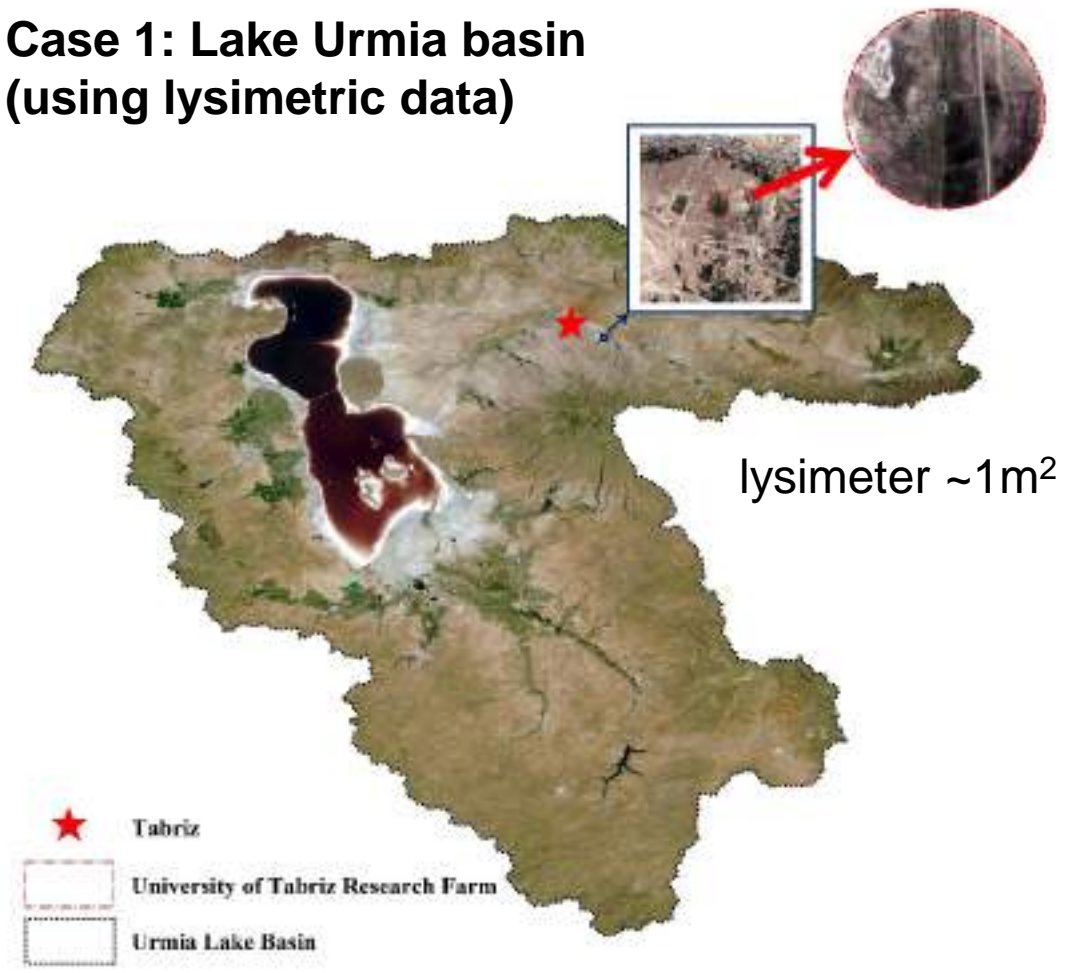
Format	References	Unit	Data	Data Subjectivity	
.xlsx	Ministry of Agriculture-Jahad (MOAJ)	-	Crop Type	Crop Data	Agro-economic data
		ha	Crop Area		
		tons/ha	Crop Yield		
.shp	WaPOR	-	Land use/land cover Map	Land use data	
	MOE	-	River Basin Boundaries		
.xlsx	Planning and Budget Organization of Iran	IRR kg ⁻¹	Guaranteed crop prices (Governmental Crop Prices)	Crop Prices in USD	
	world bank	USD IRR ⁻¹	Exchange Rate		
	world bank	IRR/IRR	Inflation Rate		
.tif	WaPOR	mm	Evapotranspiration Map	Evapotranspiration	
.tif	WaPOR	mm	Precipitation Map	Effective Precipitation	
.xlsx	FAO	mm	Effective Precipitation Look up table		
.xlsx	Conservation of Iranian Wetlands Project Site	m	Wetlands Water Level	Wetland Environmental Data	Environmental data
	Iran Water Resources Management Company	MCM/month	River Inflow into Wetland		
	Calculated using river inflow	MCM/month	Wetland Environmental Flows		



Phase 1: Accuracy assessment of WaPOR ET products



Case 1: Lake Urmia basin (using lysimetric data)



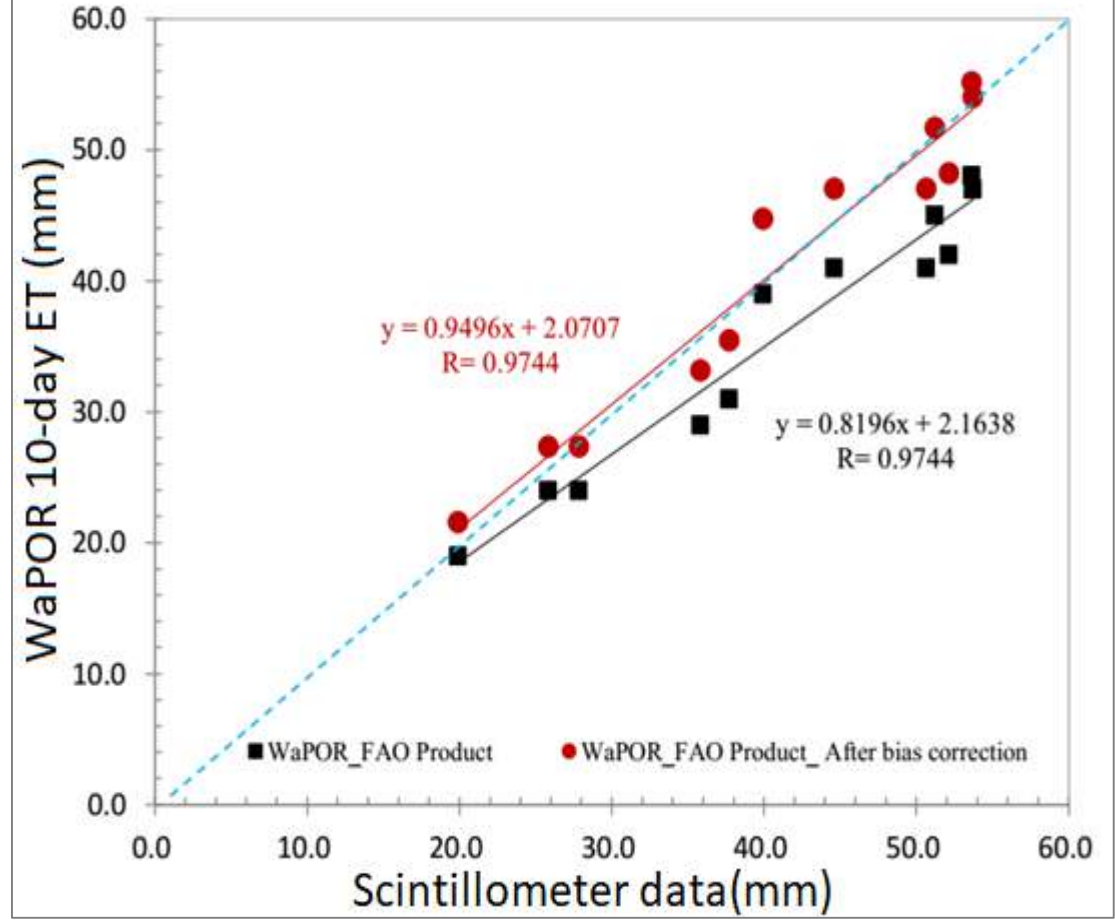
Lysimeter measurements in a 12 ha field at University of Tabriz in 39 days between 2010 and 2011 were used for validation.



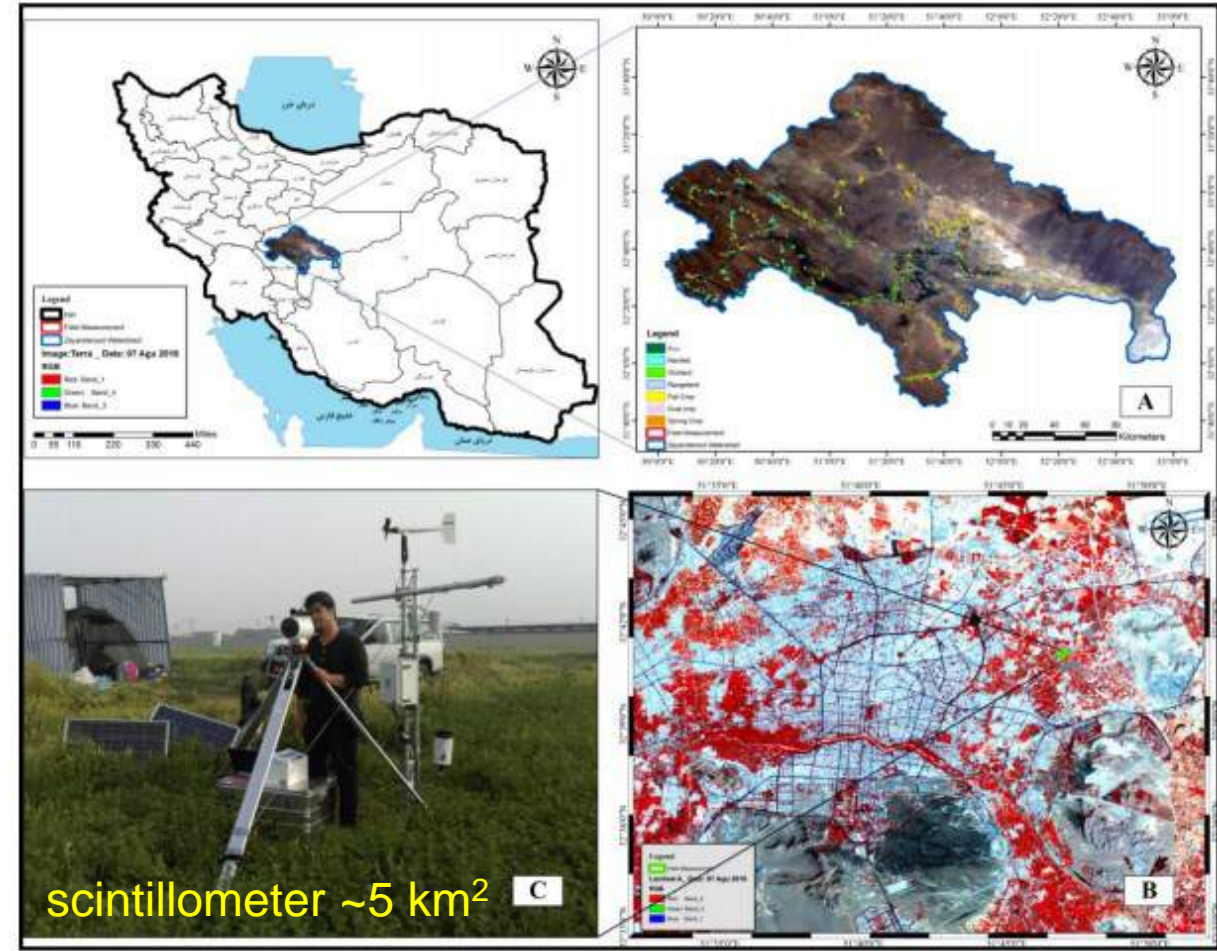
Phase 1: Accuracy assessment of WaPOR ET products



WaPOR data underestimate ET. Estimates are better at large spatial.

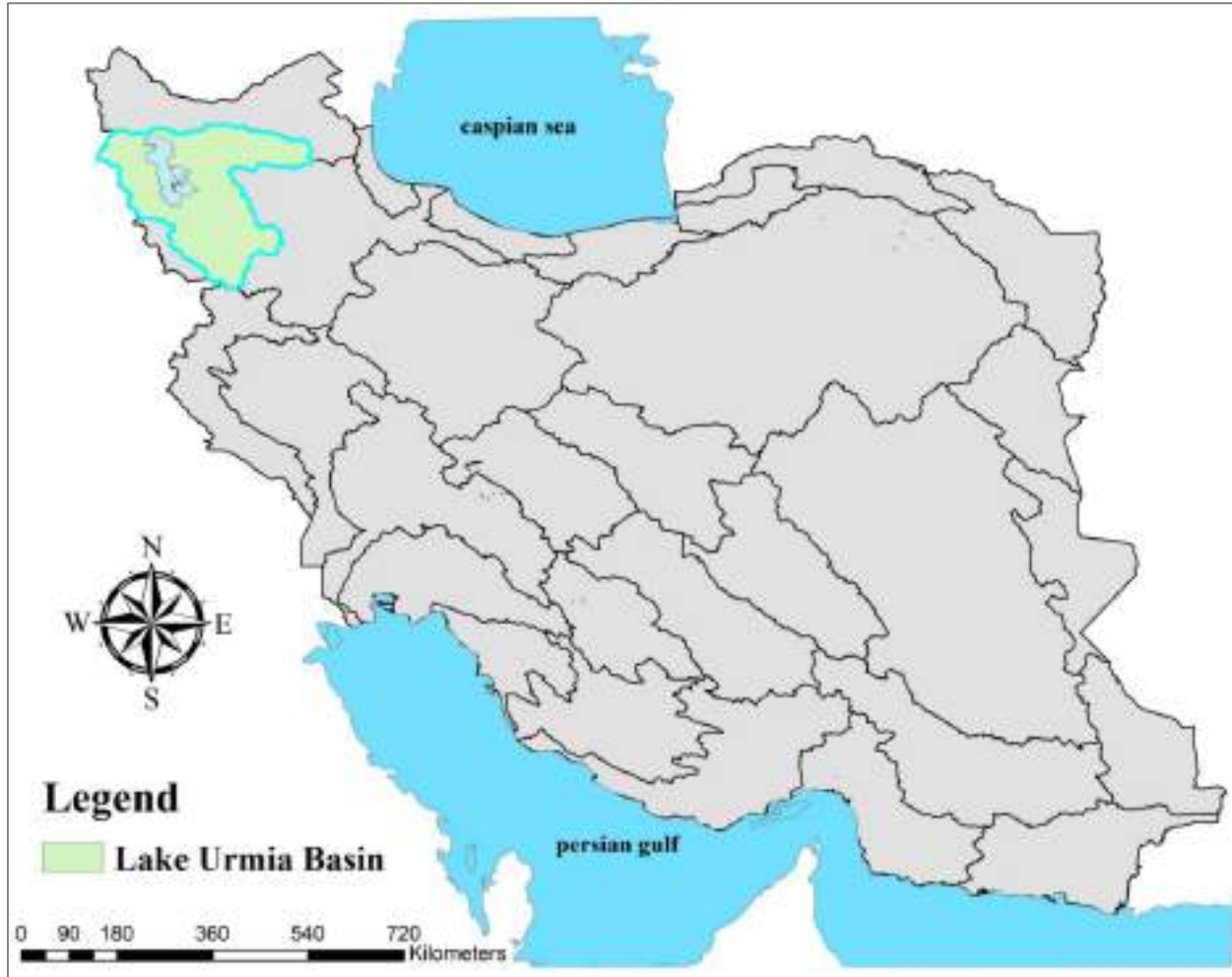


Case 2: ZayandehRud basin (using scintillometer data)





Phase 2: Applying calculation for a pilot basin



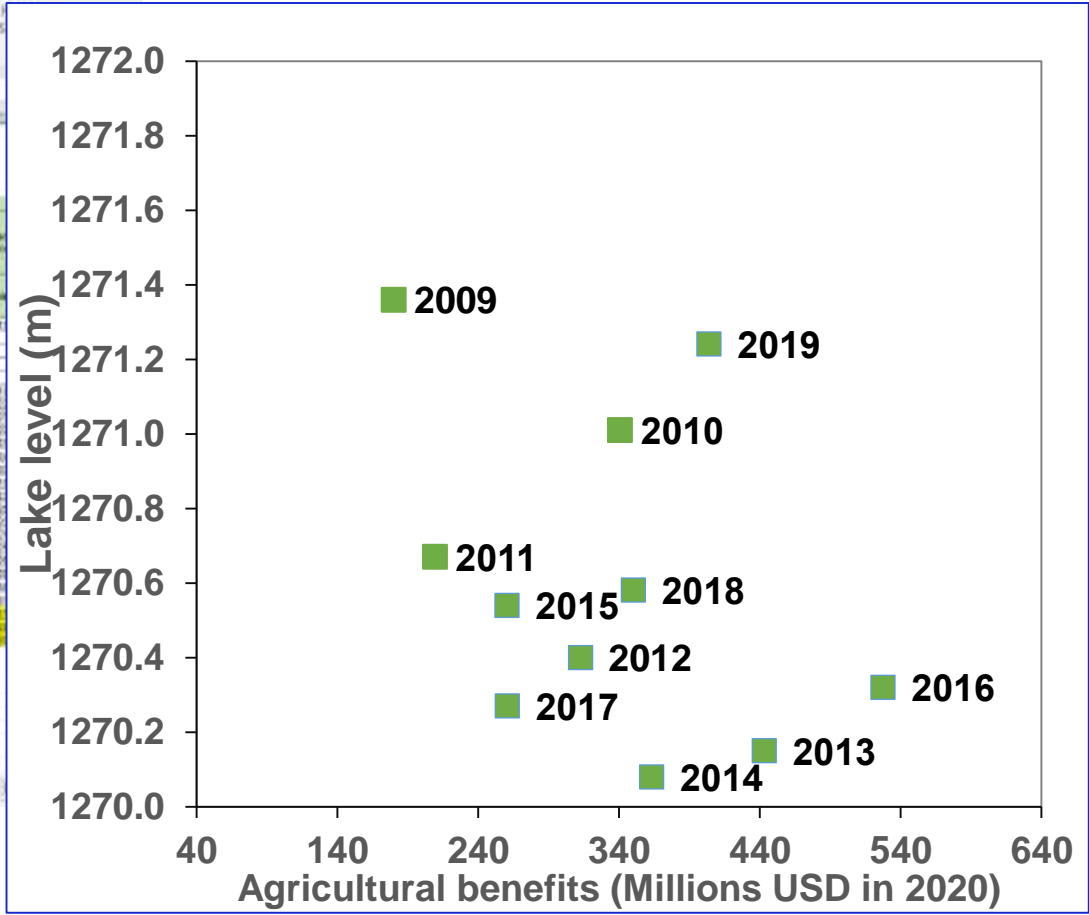
- ### Lake Urmia
- Once largest saline lake of the world (~5700 km²)
 - UNESCO Biosphere
 - Ramsar site
 - Highly desiccated



Phase 2: Applying calculation for a pilot basin

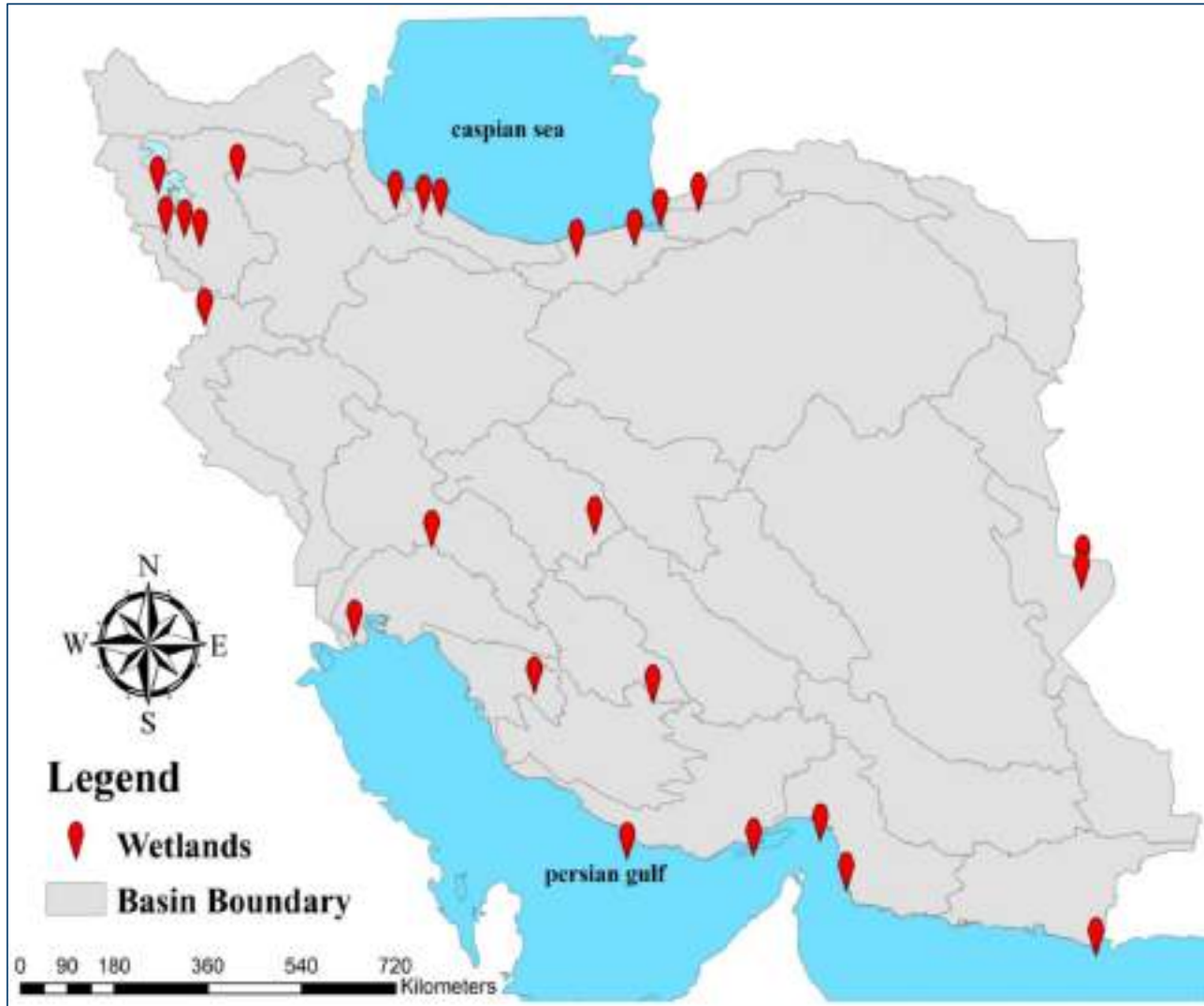


Excel spreadsheet showing data for 'Environmental vs. Agricultural decision variables for trade-off in Urmia Basin'. The table includes columns for 'Date Source', 'Water availability', 'Lake Subsystem', and 'Agricultural Subsystem'. It lists various years from 1974 to 2018 with corresponding data points for precipitation, lake levels, and agricultural benefits.





Phase 3: Developing a beta version contacting all basins (National-Scale)



Number of Wetlands	25
Total Area	1,413,040 ha

Of Iran's 25 Iranian Ramsar sites about one third are under pressure or in a critical condition.



Phase 3: Developing a beta version contacting all basins (National-Scale)



پروژه به سامانه

معرّفی مجموعه + خانه تالاب ها نقشه ها داده ها

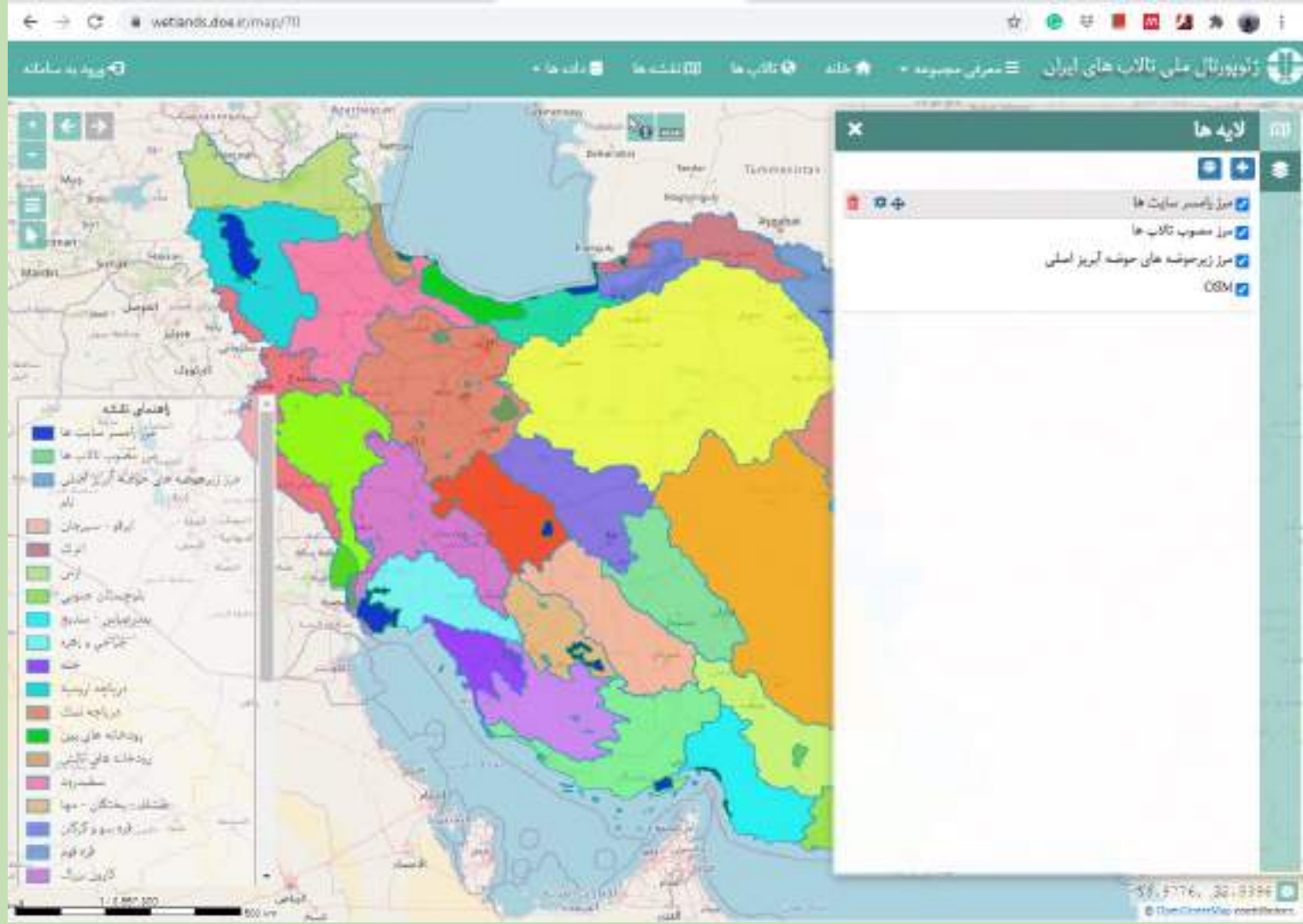
دفتر حفاظت و احیاء تالابها یک مجموعه تخصصی است که سیاستگذاری و برنامه ریزی برای ایفای مسئولیت های سازمان درحوضه تالابها و پشتیبانی فنی و کارشناسی واحد های استانی و نظارت بر عملکرد آنها و همچنین هماهنگی و نظارت بر عملکرد سایر دستگاههای مسئول در حوزه تالابها را به عهده دارد.

راهنمای کاربران نقشه استان ها تالاب های ایران

78 Wetlands	57 Maps	699 Data layer	1,064 Documents
----------------	------------	-------------------	--------------------



Phase 3: Developing a beta version contacting all basins (National-Scale)

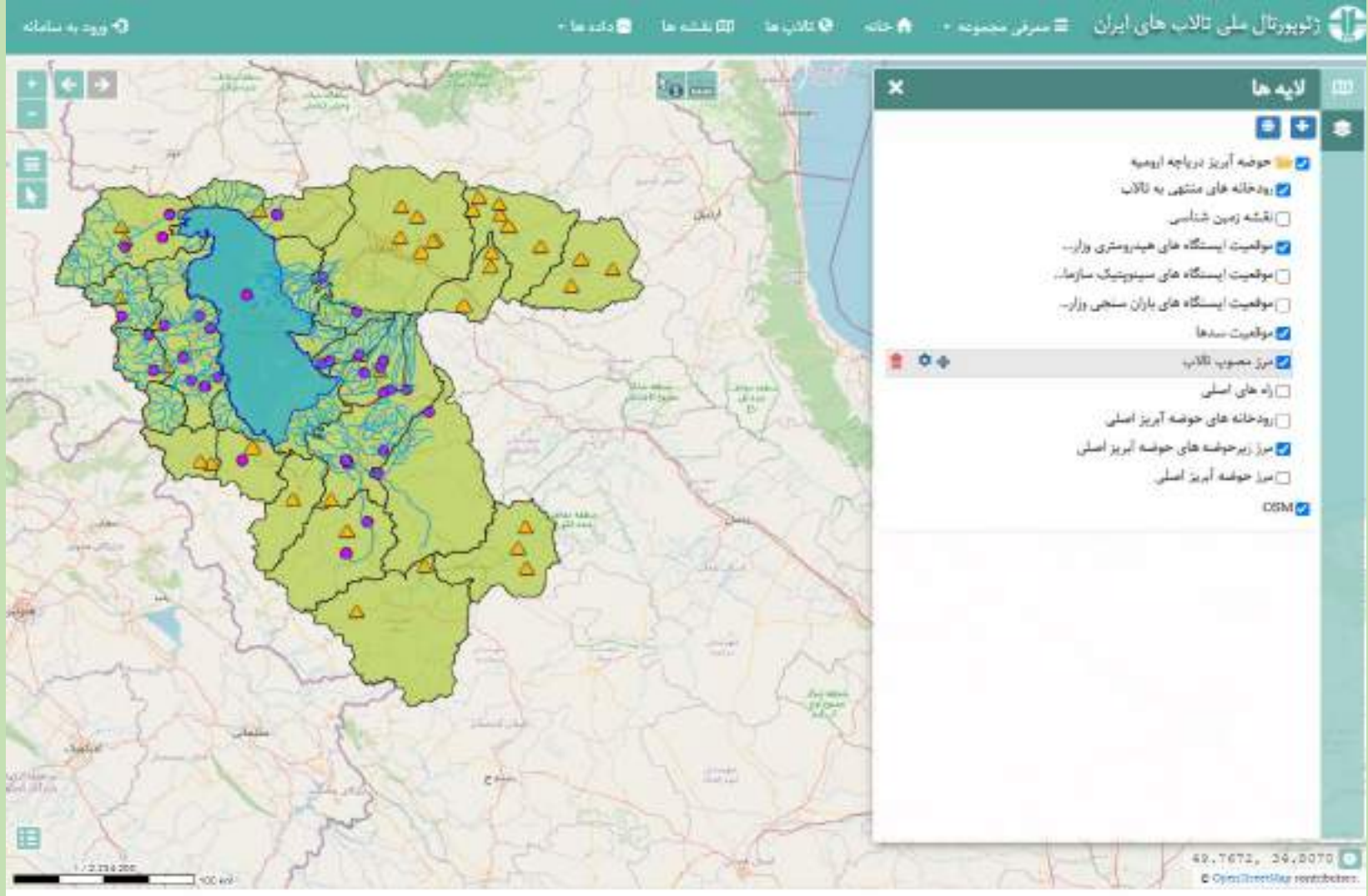


WaterPIP Webinar :WaPOR Hackathon, Update from the Winning Teams
Oct 13, 2021

Wetlands.doe.ir



Phase 3: Developing a beta version contacting all basins (National-Scale)





Phase 3: Developing a beta version contacting all basins (National-Scale)





Negotiations with potential customers



**Department Of Environment
Islamic Republic of Iran**



*I.R. Iran
Ministry of Energy*



**Presidency of the Islamic
Republic of Iran
Vice-Presidency for
Science and Technology**

**Deputy of Marine ecosystems
and Wetlands**

**Ministry of Energy (MOE), Center
for social affairs**

**Geoscience working
group**

- Environmental flows allocation
- Compromising ecosystem services of wetlands with Agricultural revenue
- Developing the current wetland geoportal

- Agro-economic analysis for better coordination with ministry of Agriculture
- Assessing socio-economic impacts of water allocation policies

- Supporting knowledge-based applied projects in geoscience



Challenges a head



➤ Logistics

- Need infrastructure (appropriate servers) for the phase 3 (national-scale DB)
- Lack of budget
- Need to create coordination between the target state organizations

➤ Technical

- Producing and updating crop maps
- Adapting the portal with the available national-scale platforms



Thanks for your attention



Somayeh Sima

Assistant Professor,
Faculty of Civil &
Environmental Engineering



Zanko Zandsalimi

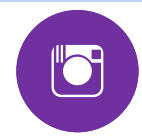


Amin Hoshmandi



Parisa Tayebi

Researchers at RIWEM
MSc. Graduate, Water Engineering



RIWEM.TMU



riwem@modares.ac.ir



www.riwem.modares.ac.ir



+98-21-82884342
+98-21-82883998