JUNE 4, 2025

#EU GREEN WEEK

EU Green Week Partner Event

THE WATER-ENERGY-FOOD NEXUS: BUILDING RESILIENCE TO GLOBAL CHALLENGES

NexusNet

cost
EUROPEAN COOPERATION IN SCIENCE & TECHNOLOGY

AWESOME
WATER-ECOSYSTEM-FOOD

Developing policy recommendations to support innovation in soilless agriculture within the Nile River Basin: A participatory approach using Multi-Actor Working Groups

Ms Eirini Afentouli, Dr Ebun Akinsete, Ms Lydia Stergiopoulou, Dr Theofanis Zacharatos and Prof Dr Phoebe Koundouri

PRIMA
PARTNERSHIP FOR RESEARCH AND INNOVATION IN THE MEDITERRANEAN AREA

#EUGREENWEEK

Since 1997

AE4RIA

Alliance of Excellence for Research and Innovation on Aephoria

200 RESEARCHERS | 100 PROJECTS | 120 COUNTRIES | 150 CONFERENCES | 1,000 PUBLICATIONS | 500M MILLION FUNDING

Innovative Systems Transformations for Sustainable Inteaction Nature-Economy-Society

Research and Innovation Centers

- ReSEES Research Laboratory - Athens University of Economics and Business
- Stochastic Modeling and Applications Laboratory - Athens University of Economics and Business
- Sustainable Development Unit - Athena Research Center
- Department of Technology, Management, and Economics - Technical University of Denmark

Innovation Acceleration Hubs

- UN Climate Change Global Innovation Hub
- EIT Climate-KIC
- Brigaid Connect
- MENA Maritime Accelerator
- Black Sea Accelerator

Science - Policy Networks

- Sustainable Development Solutions Network (SDSN)
- SDSN Global Climate Hub
- SDSN Europe
- SDSN Greece
- Water Europe
- Nexus cluster
- Earth-Humanity Coalition (EHC)

Scientific Associations and Academies

- World Council of Environmental and Resource Economists Associations (WCEREA)
- European Association of Environmental and Resource Economists (EAERE)
- World Academy of Art and Science (WAAS)
- Academia Europaea
- European Academy of Sciences and Arts
- InterAcademy Partnership (IAP)
- Academy of Engineering and Technology of the Developing World (AETDEW)

Thematic Priorities: Interdisciplinary & Intradisiplinary

Climate Neutrality - Resilience

WFEB LULUCF

Oceans Seas

Socio-Economics Financial

Innovation Acceleration

Education Skills

Prof. Phoebe Koundouri
Founder and Scientific Chair

AWESOME project (2020-2023): A decision analytic framework for managing Water Ecosystems and Food across sectors and scales in the South Mediterranean

https://awesome-prima.eu/

AWESOME
WATER-ECOSYSTEM-FOOD

AWESOME MAIN OBJECTIVES

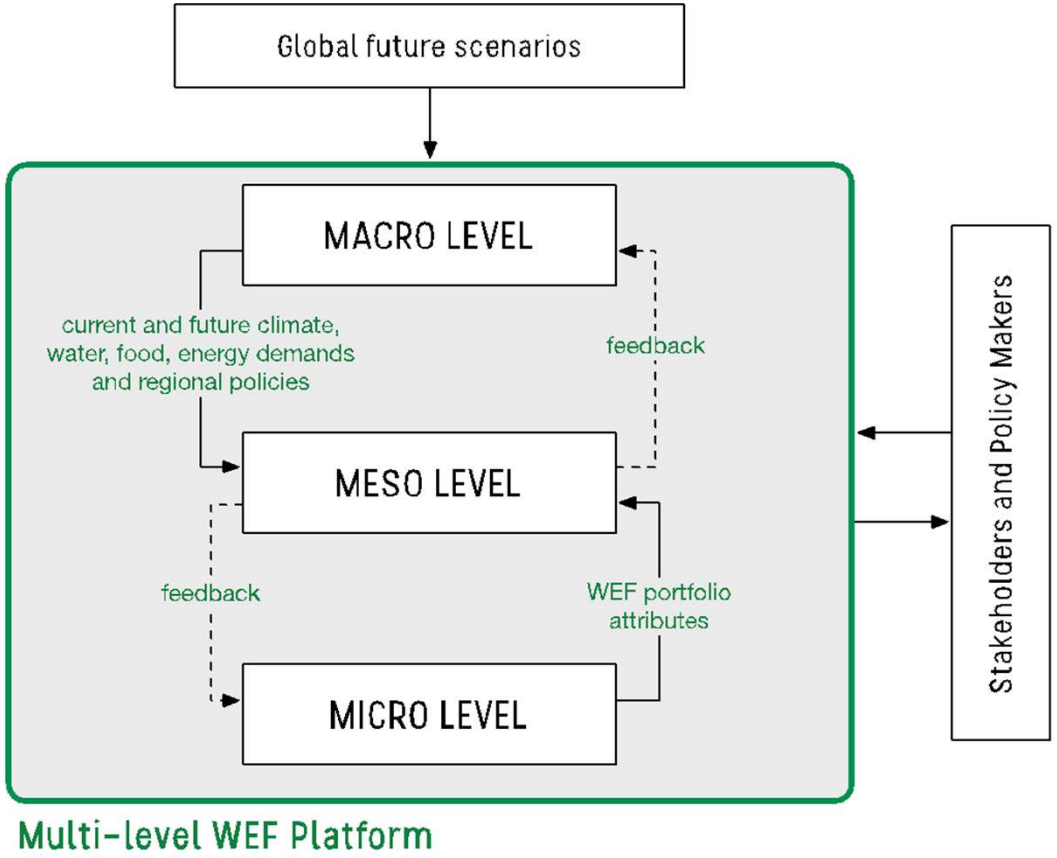
Develop a **decision-analytic platform**

- for assessing **WEF planning portfolios**

- based on a **multi-level, integrated WEF model**

- to better understand **multi-sectoral WEF tradeoffs**

- also exploring feedbacks across **a hierarchy of spatial scales**.



Multi-level WEF Platform

AWESOME CASE STUDY

MAIN CHALLENGES IN THE NILE

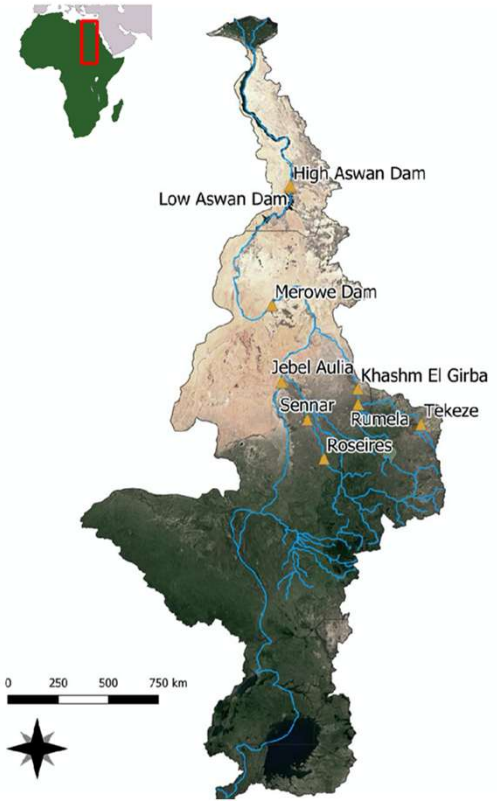
- Population growth macro
- Climate change macr
- Transboundary agreements meso
- Water management measures meso

THREAT FOR

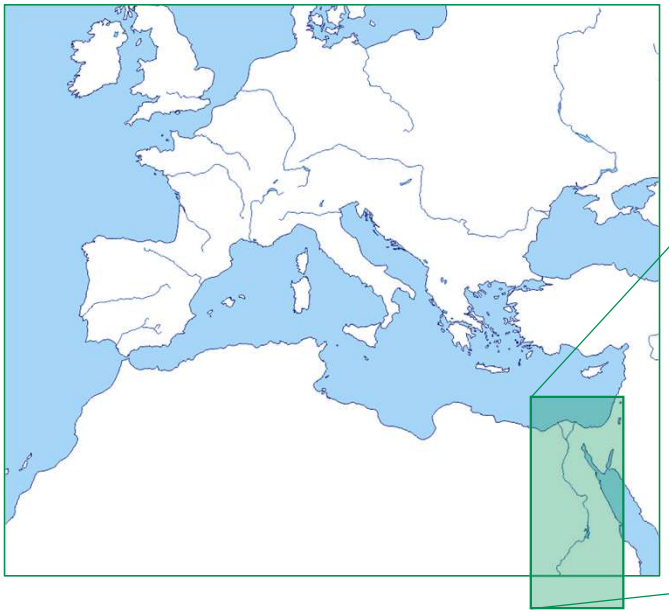
- water availability macro
- food security macro
- economic development and environment macro

STRATEGIC MEASURES & OBJECTIVES IN EGYPT (NILE DELTA)

- - Expanding desalination in coastal and remote areas
- - Pumping GW rationally and sustainably
- - Expanding greenhouse cultivations (e.g., hydroponics)
- - Promoting less consuming and salt tolerant crops



Three Levels of AWESOME



MACRO LEVEL
Mediterranean Region

MESO LEVEL
Nile river basin

MICRO LEVEL
Demo Site - Cairo

THE 3 LEVELS OF AWESOME

MICRO LEVEL

Exploring effectiveness of alternative smart food production options

Hydroponics

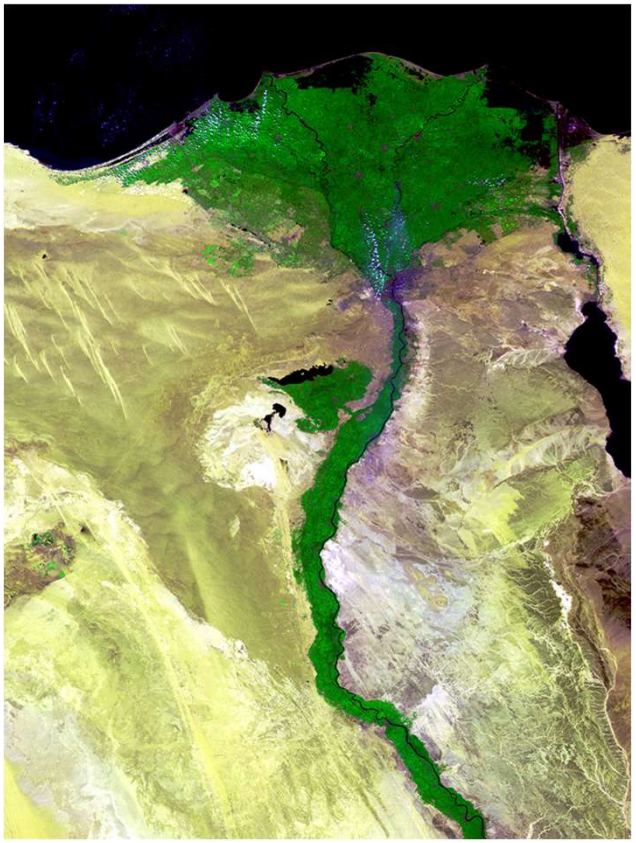
Aquaculture

Aquaponics

THE 3 LEVELS OF AWESOME

MESO LEVEL

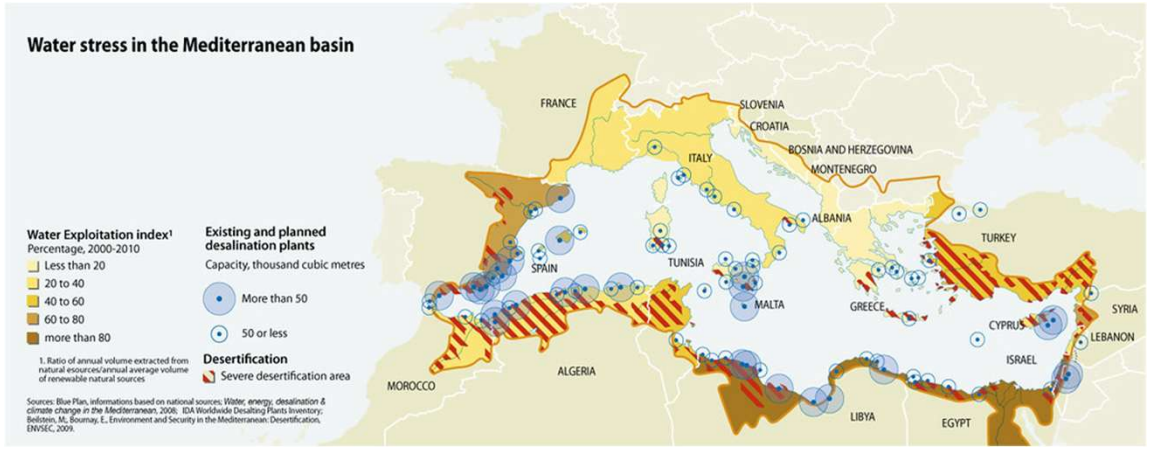
Exploring integration and upscaling of smart food technologies in river basin management

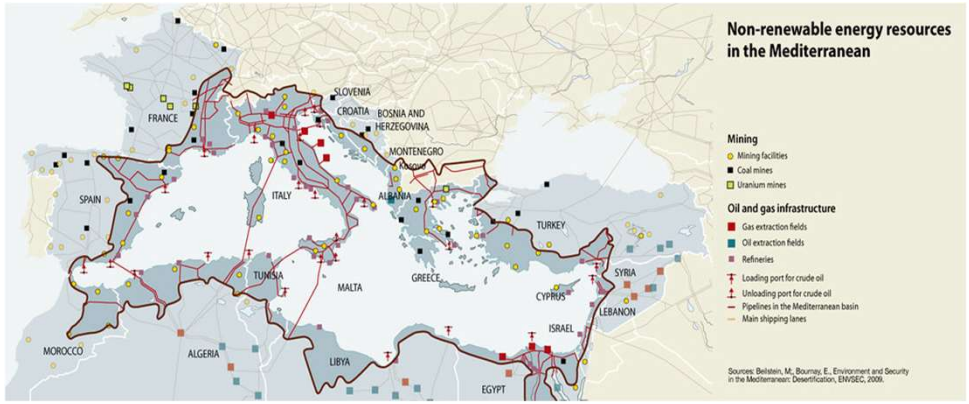


THE 3 LEVELS OF AWESOME

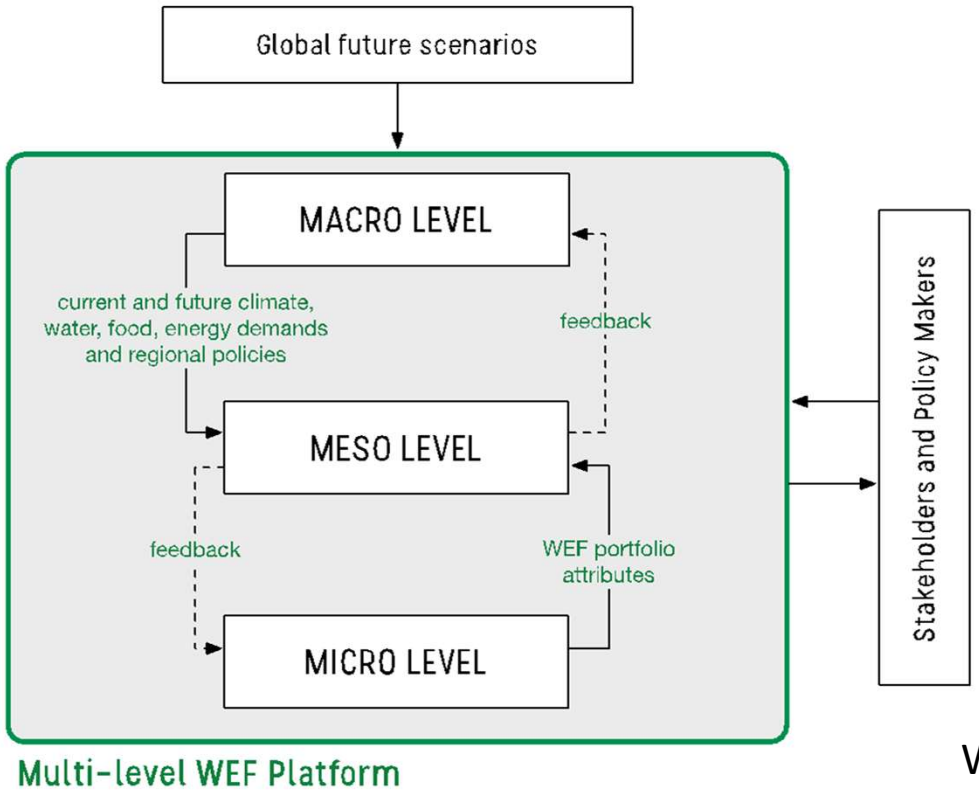
MACRO LEVEL

Generating future population, food, energy and water scenarios and regional policies to the meso scale

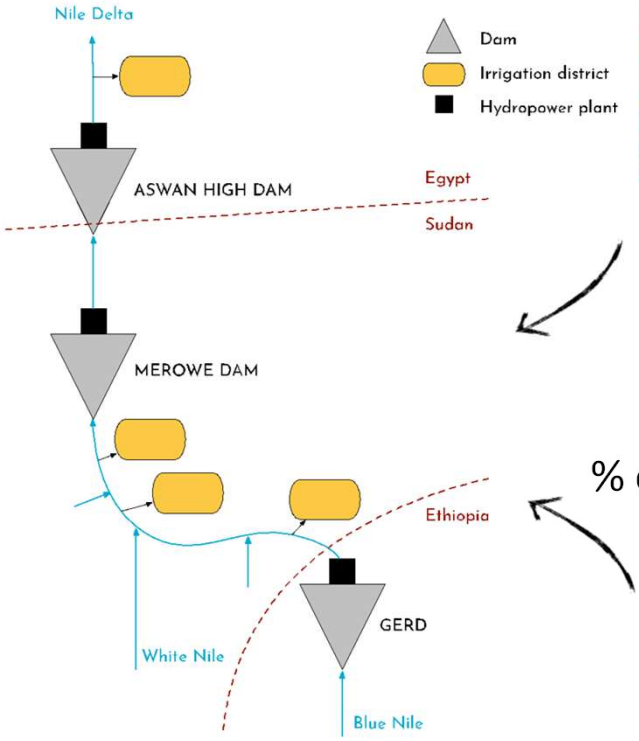




AWESOME WEFE PLANNING PORTFOLIOS



Multi-level WEF Platform

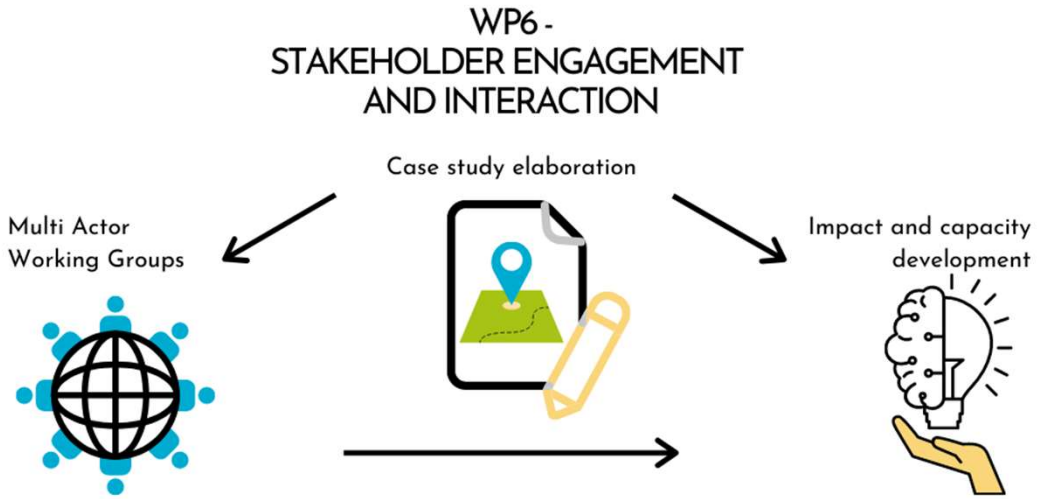


Water management strategy and irrigation supply

Regional policy for RES incentives

% of replacement of agriculture with aquaponics

STAKEHOLDERS ENGAGEMENT AND INTERACTION AT MESO LEVEL

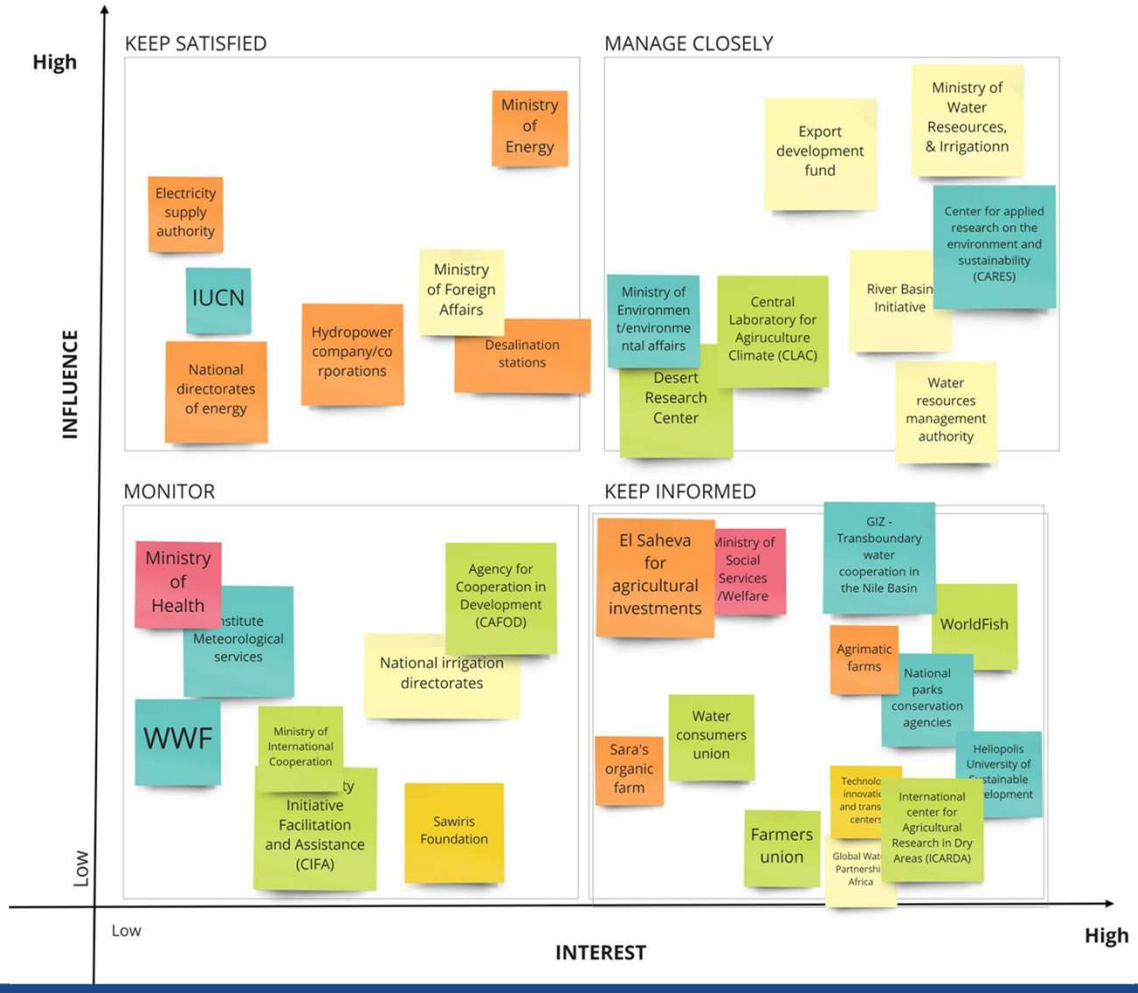


Case study elaboration

Stakeholders mapping and analysis

Description of the case study, elaboration

of the key WEFE Nexus issues, key ES, and stakeholders engagement

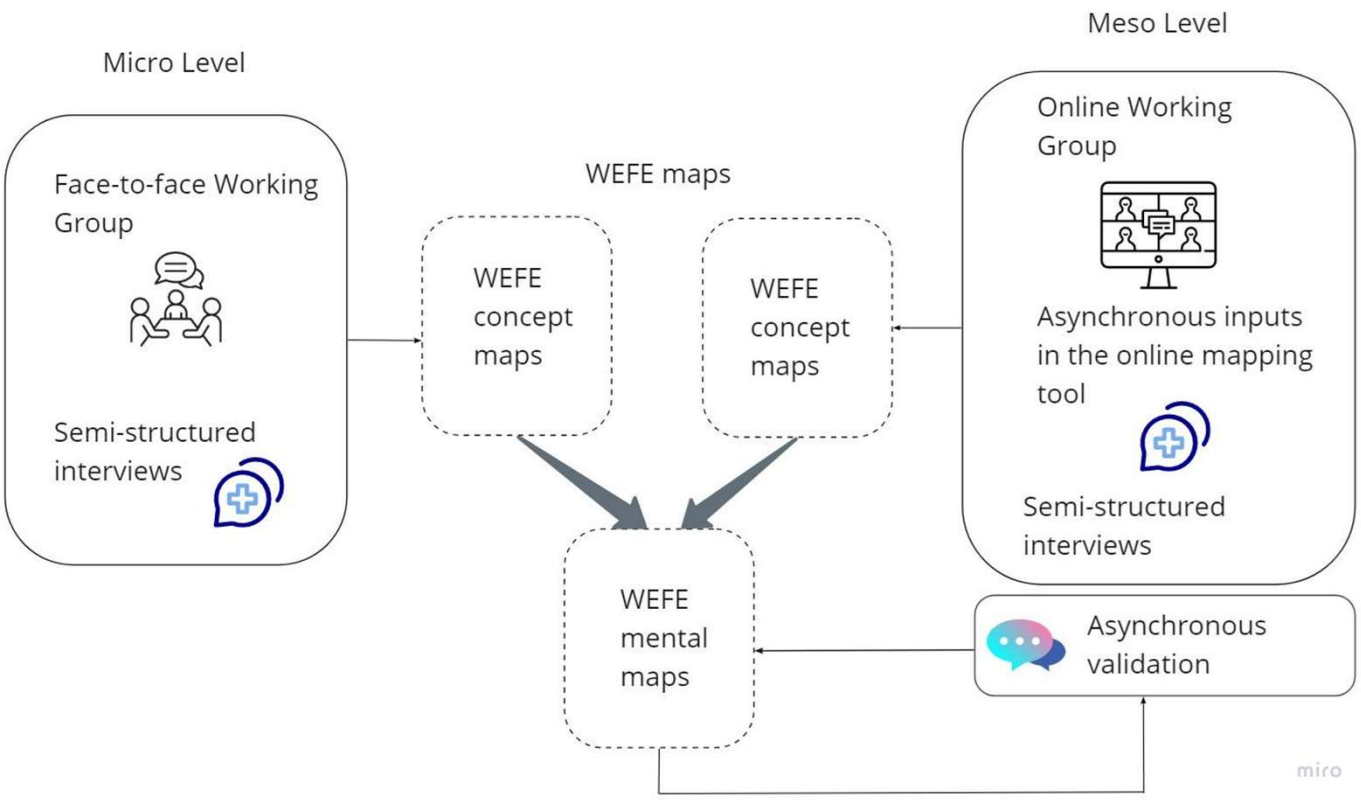


Multi-Actor Working Groups (MAWGs)

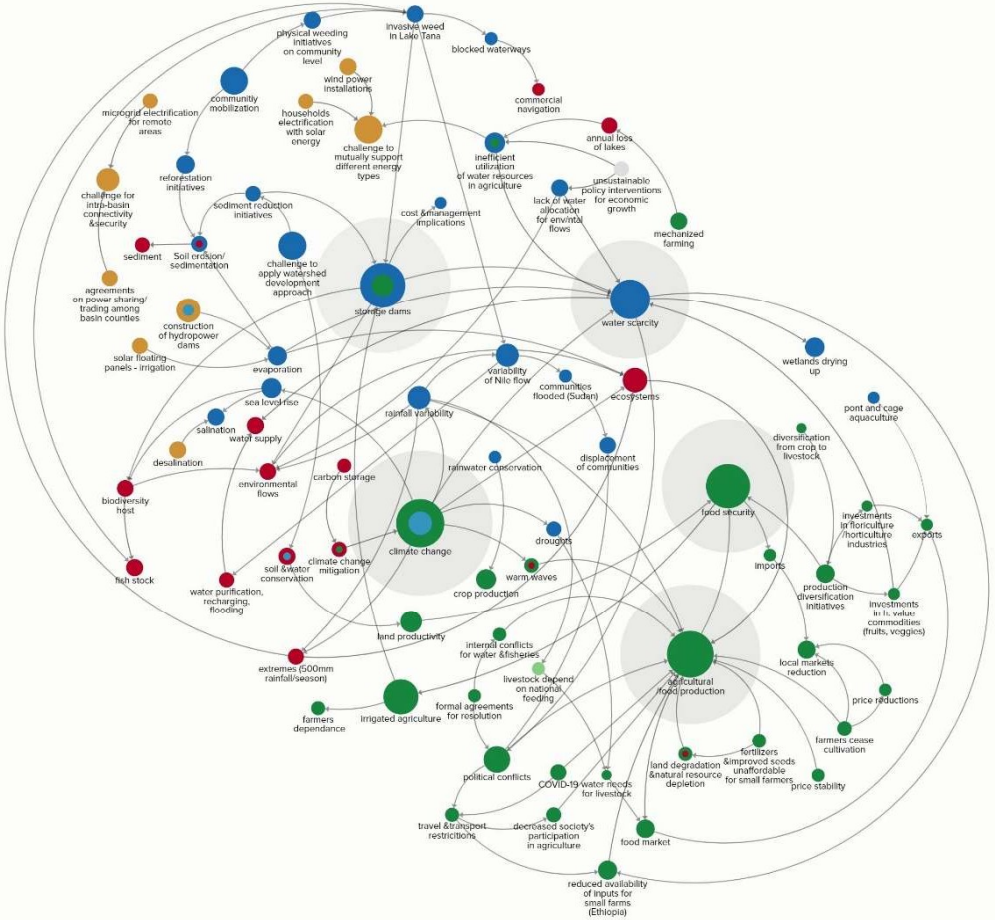
WEFE mental mapping tool:

- incorporates local experts' knowledge
- communicates complex interactions
- shows the bigger picture
- engages stakeholders in research

Micro and meso level MAWGs interplay



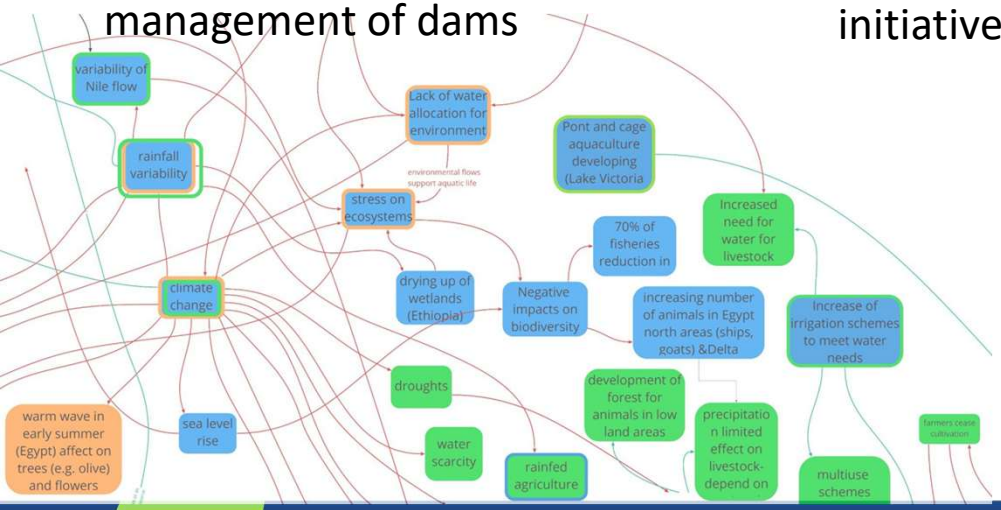
WEFE Nexus mental model



Findings

Findings for Water:

- High variability of flow
- Flooding issues
- Dams impacting aquatic biodiversity, sedimentation & evaporation
- Climate change
- Inefficient water utilization
- Opportunities for cooperative management of dams



Findings for the Energy:

- Interconnectivity between basin countries
- Opportunity for combinations, initiatives and energy security

Findings for the Food:

- Promotion of irrigated agriculture
- Increased water demand
- Watershed development
- Internal conflicts
- Impacts from the pandemics
- Inputs availability (seeds, fertilizers)
- Exports increase

Findings for the Ecosystems:

- Rich and diverse ecosystem types
- Ecosystem services
- Need for integrated watershed approach and participatory planning

Policy challenges

- Promoting new multi-purpose projects that combine multiple complementary activities
- Factoring environmental flows
- Watershed management approaches
- Energy sharing arrangements
- Evaporation and sediment management
- Regional approaches to food security and agricultural markets must be prioritized, alongside strengthening transboundary cooperation.

Opportunities

- Promoting new multi-purpose projects that combine multiple complementary activities
- Factoring environmental flows
- Watershed management approaches
- Energy sharing arrangements
- Evaporation and sediment management
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Thank you!
PRIMA
IN THE MEDITERRANEAN AREA

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