

HOW EFFECTIVE WATER GOVERNANCE BE IMPLEMENTED ACROSS BORDERS?

THE CASE OF THE MESTA/NESTOS BASIN

by

J. Ganoulis

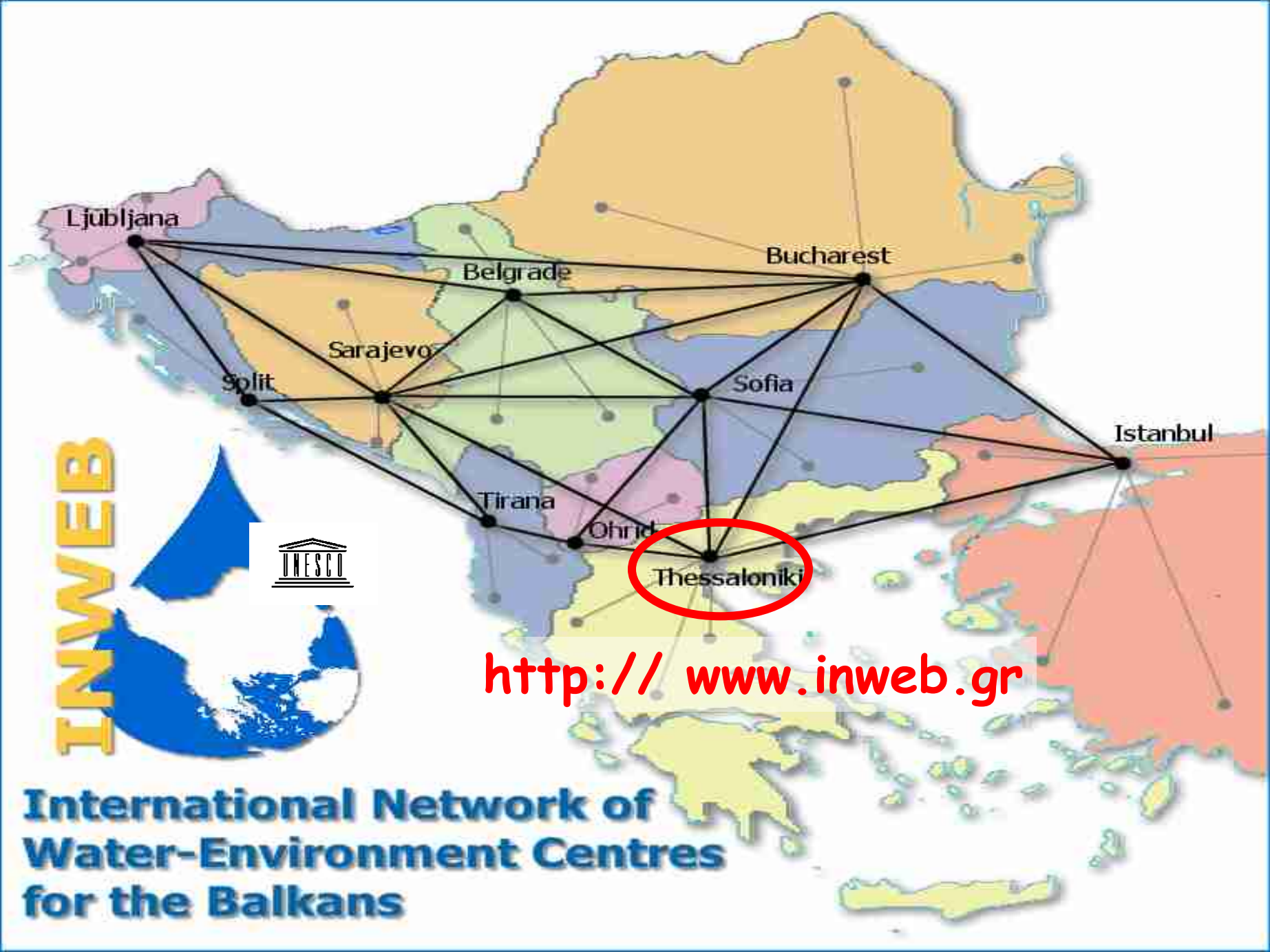
UNESCO Chair/INWEB

International Network of Water/Environment Centres for the Balkans

Aristotle University of Thessaloniki, Greece

[http:// www.inweb.gr](http://www.inweb.gr)





INWEB



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**International Network of
Water-Environment Centres
for the Balkans**

UNESCO-INWEB activities in the Balkans (SEE)

shared aquifer
resources management
in the MENA region



Databases on Internationally Shared Waters



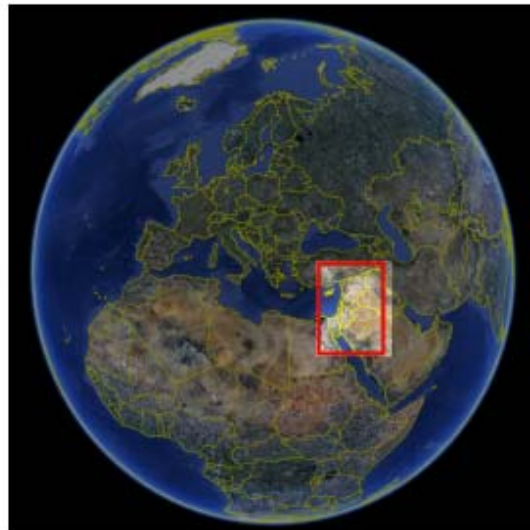
Shared Surface Waters in SE Europe



Shared Aquifers in South East Europe



Shared Aquifers in N. Africa



Shared Aquifers in the Middle East

Sub-Danubian Transboundary River & Lake Basins in the Balkans



Legend

--- Country Borders

— Rivers

— Lakes

Transboundary River Basins

Cetina

Drin

Drina

Kupa/Kolpa

Maritza/Evros/Ergene

Mesta/Nestos

Neretva

Sava

Struma/Strymon

Trebisnjica

Tundja/Tunca

Una

Vardar/Axios

Vjosa/Aoos

Transboundary Lakes

Lake Dojran/Doirani

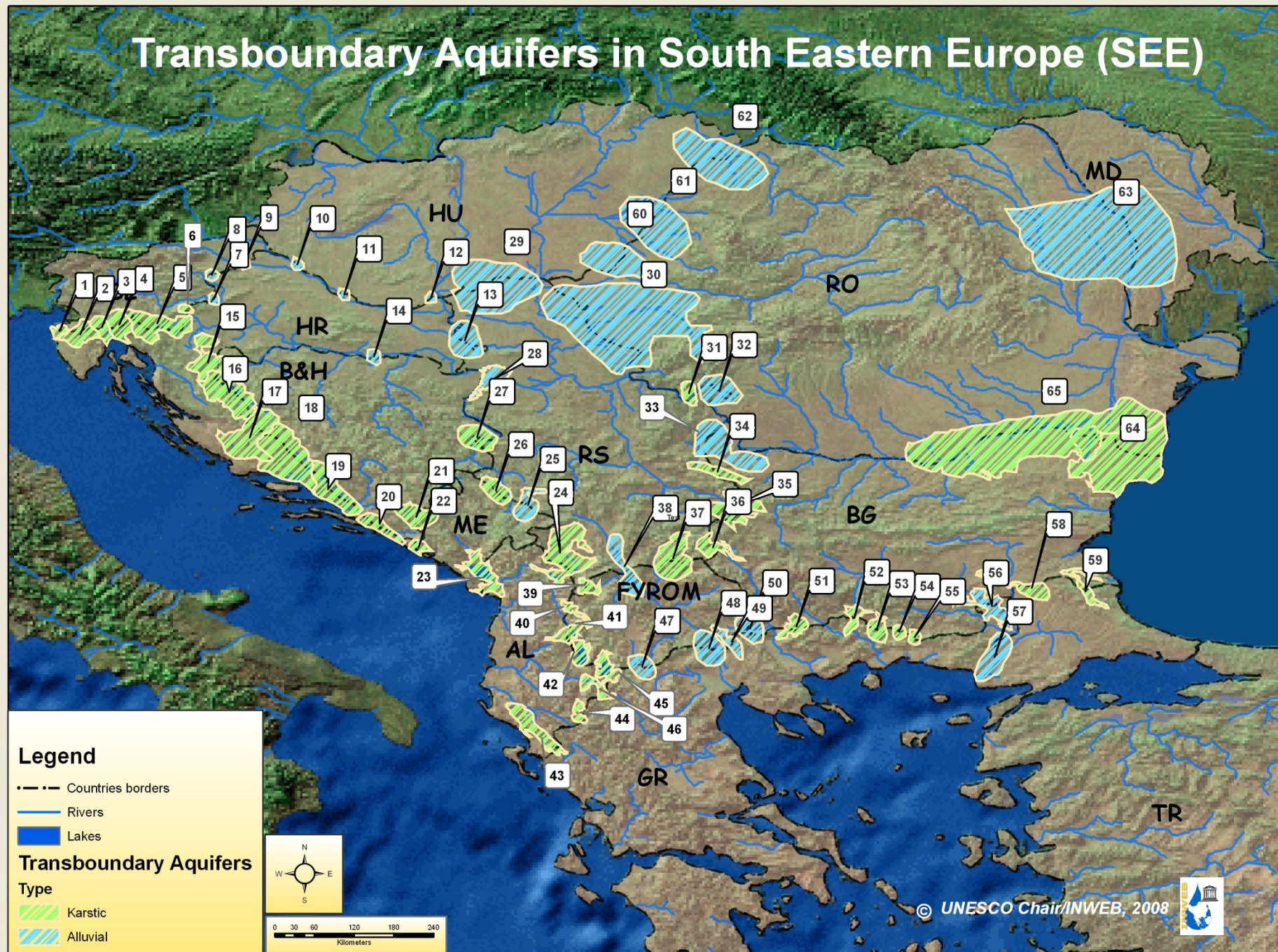
Lake Ohrid

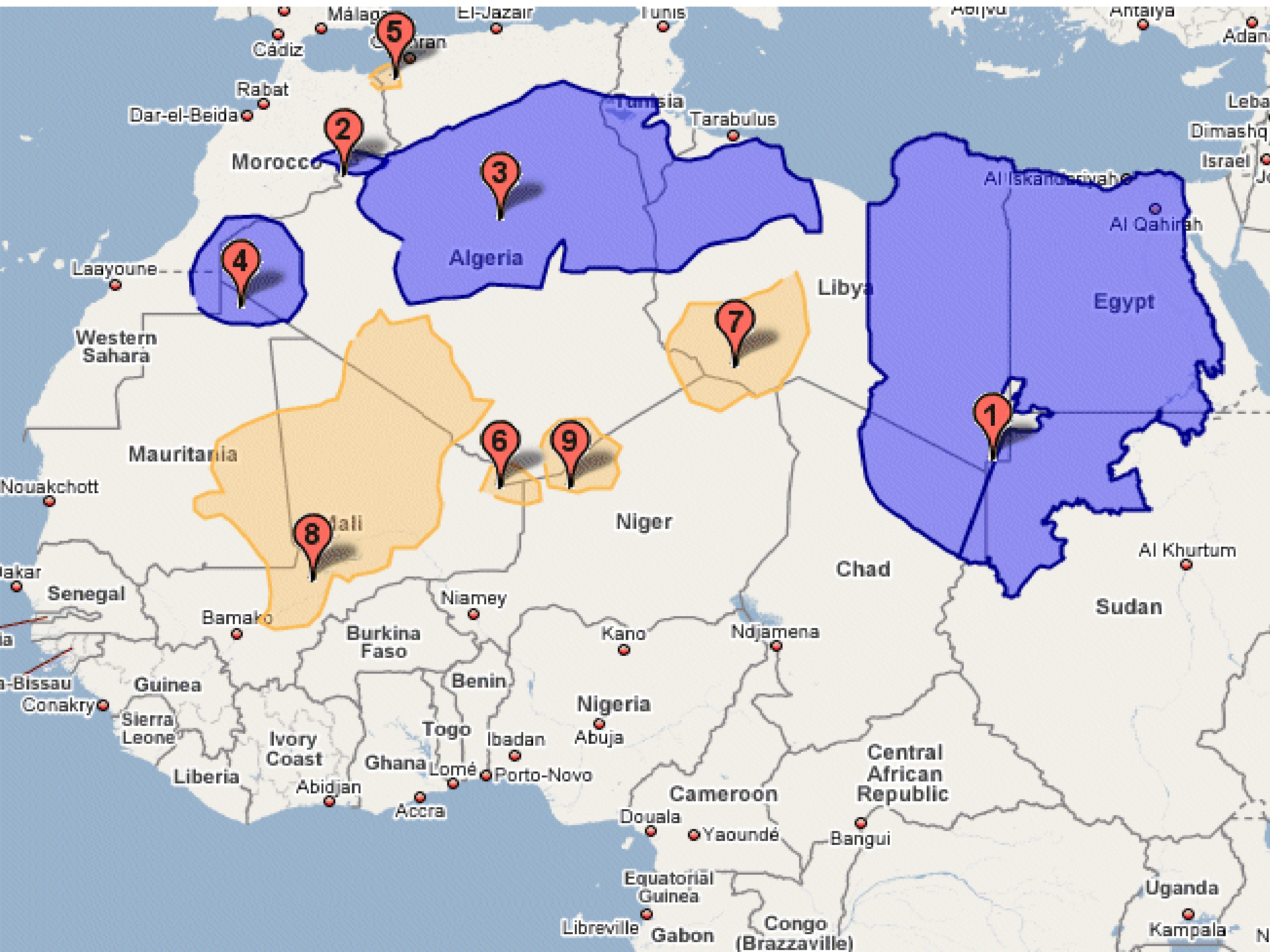
Lake Prespa

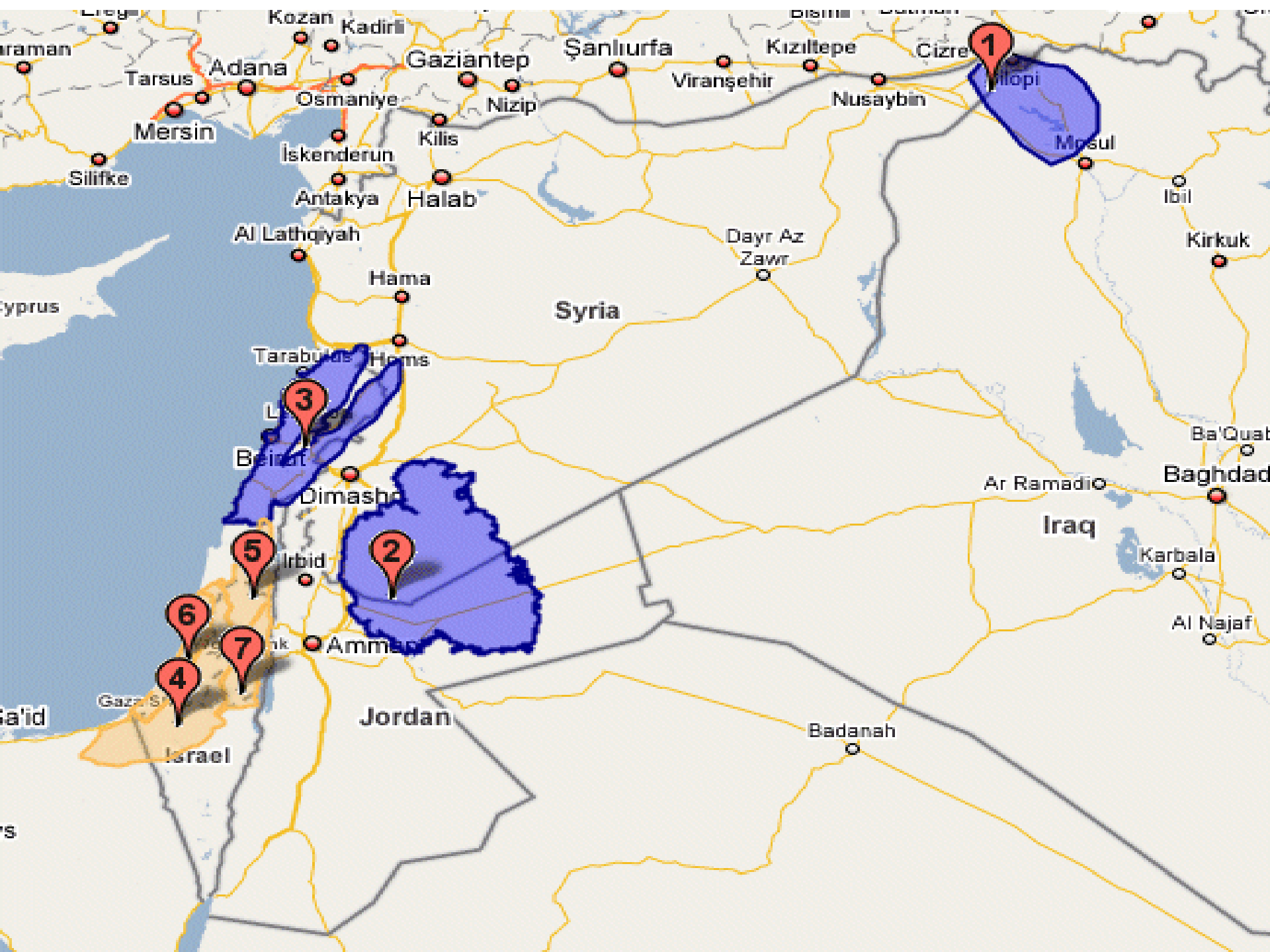
Lake Skadar/Shkodra



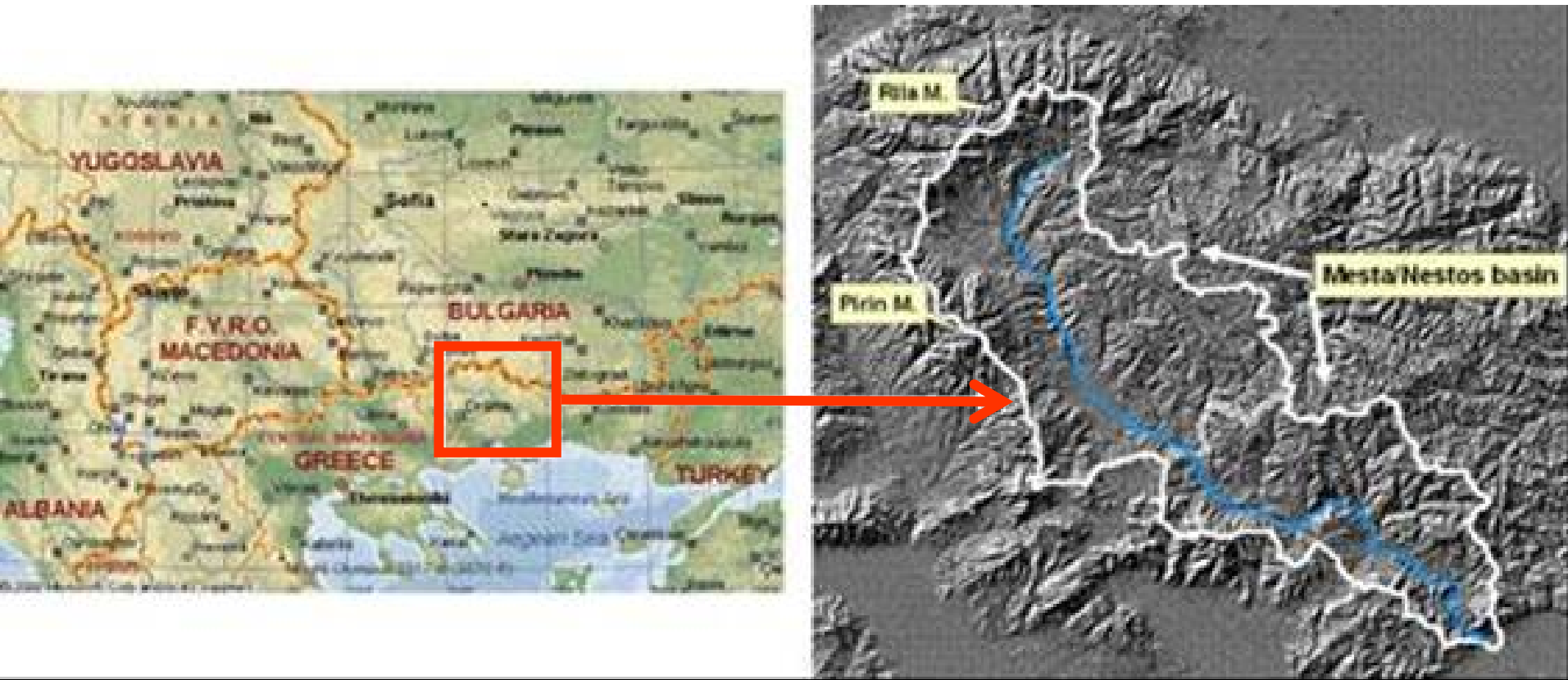
Transboundary Aquifers in South Eastern Europe (SEE)

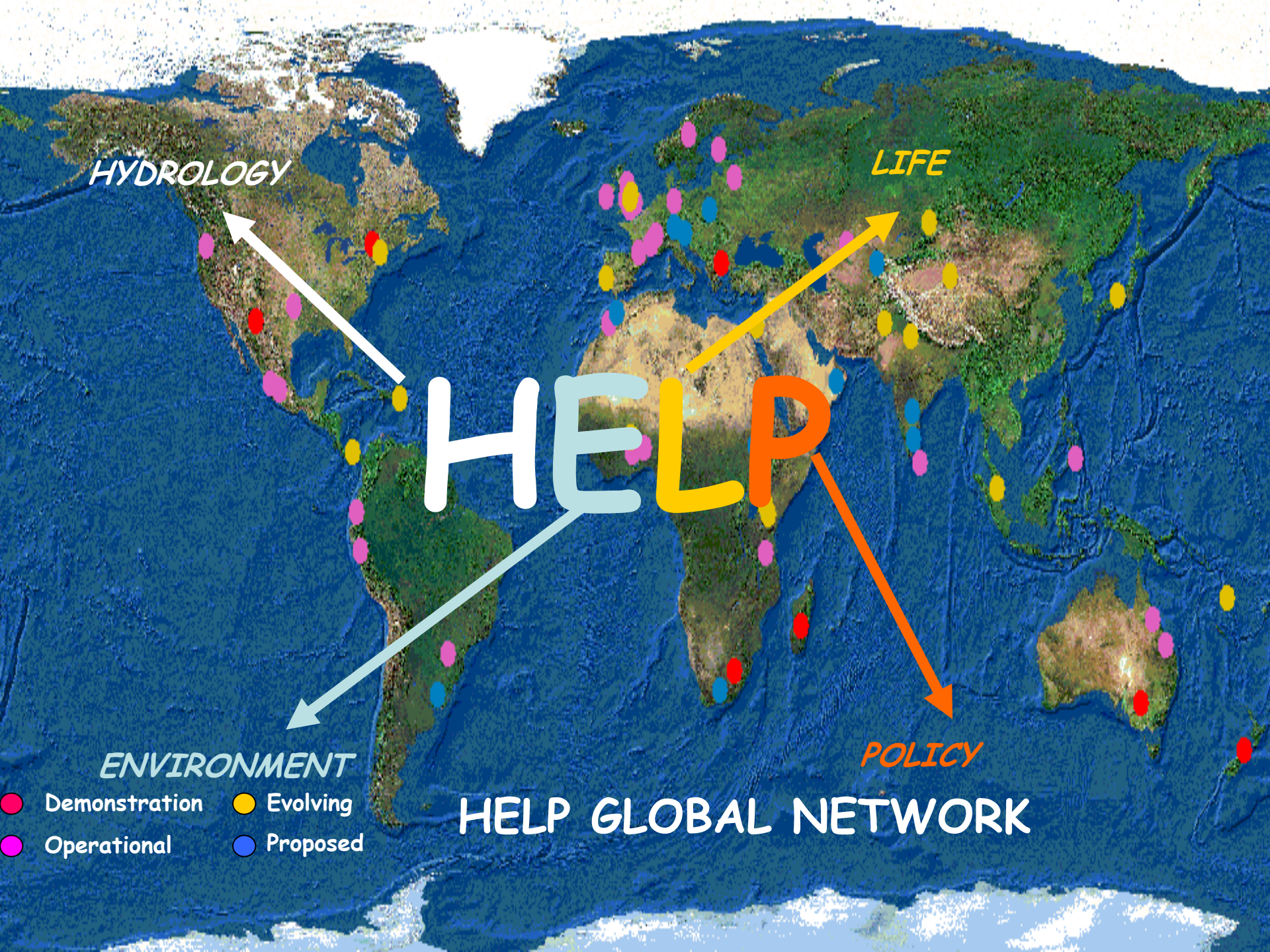


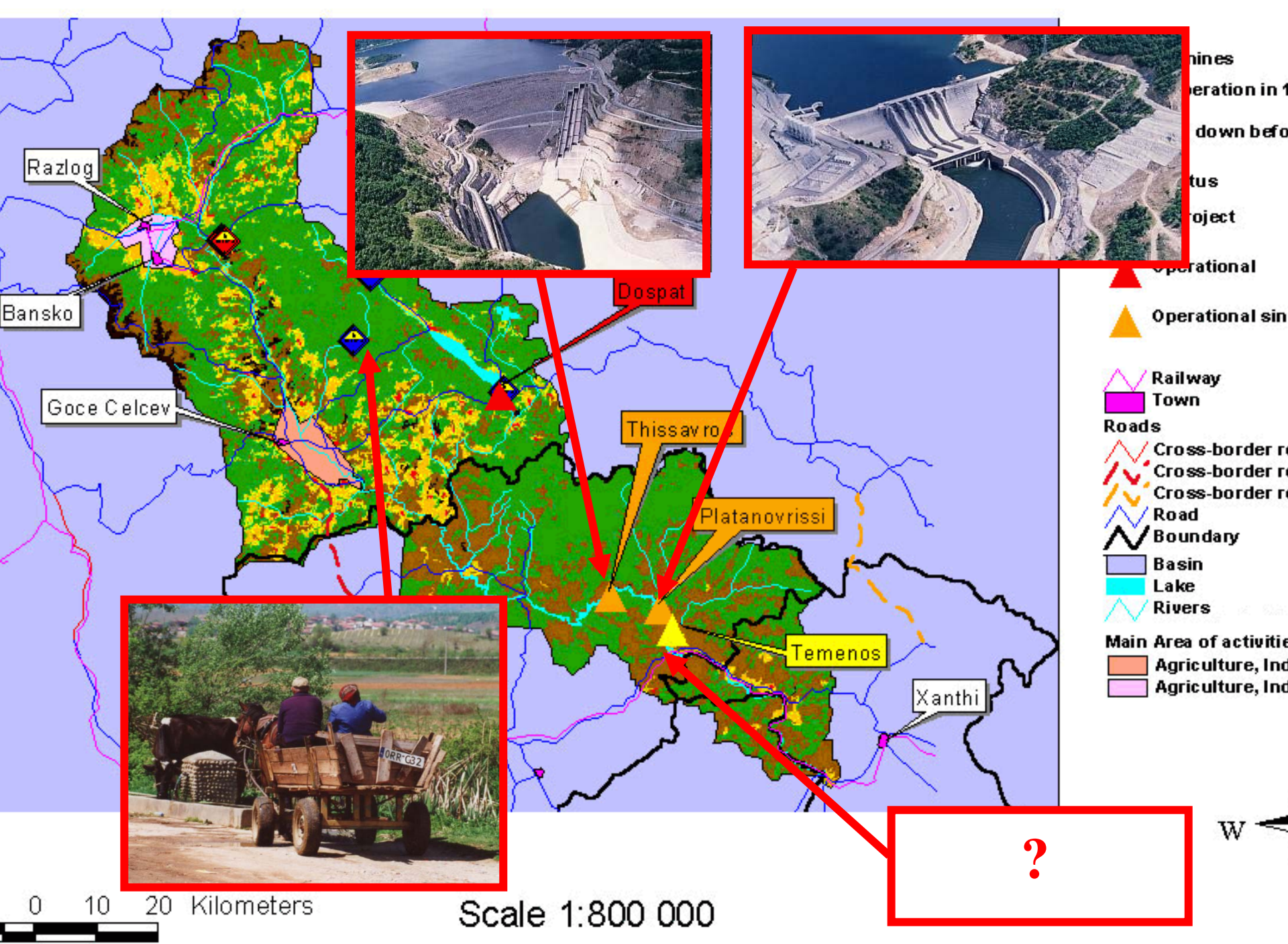




A UNESCO-HELP CASE STUDY

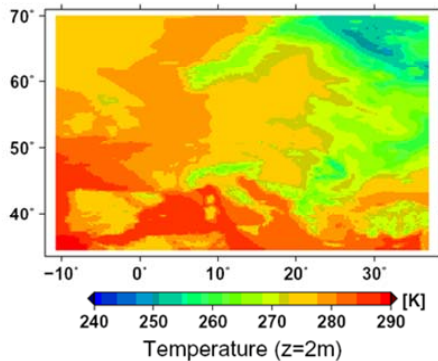






HYDROLOGICAL DOWNSCALING

LOCAL CLIMATE SCALE

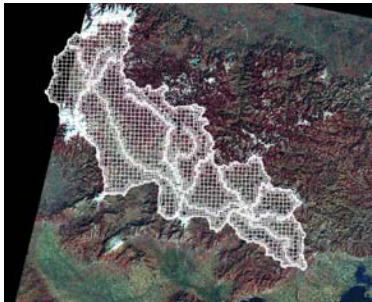


ECHAM5/EMPIOM
LOCAL CLIMATE MODEL
(CLM)
20 x 20 Km

- TEMPERATURE
- PRECIPITATION
- WIND
- HUMIDITY
- RADIATION

DOWN
SCALING

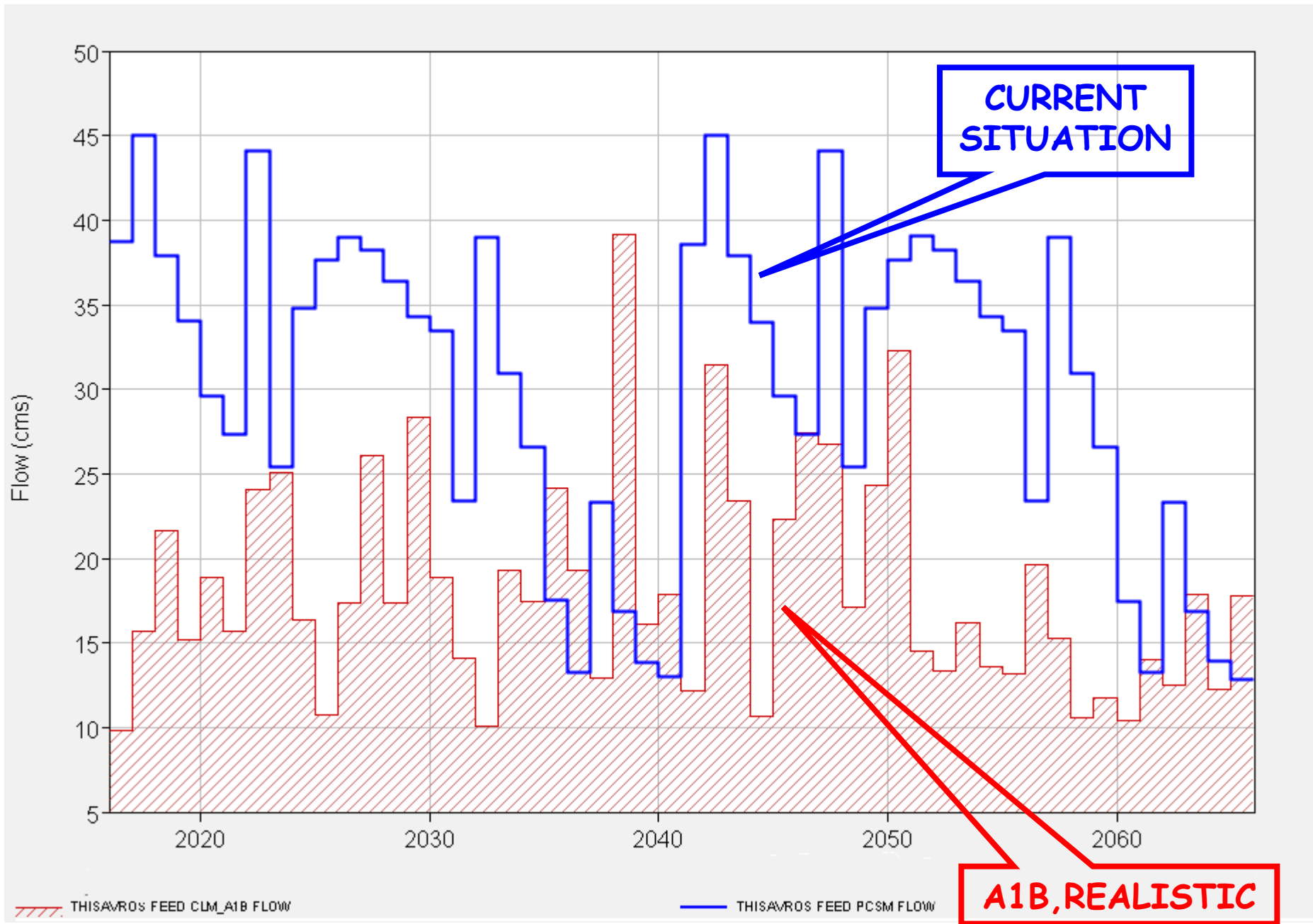
RIVER CATCHMENT SCALE



- OROGRAPHY
- LAND USE
- GEOLOGY
- HYDROGRAPHY
- SOILS

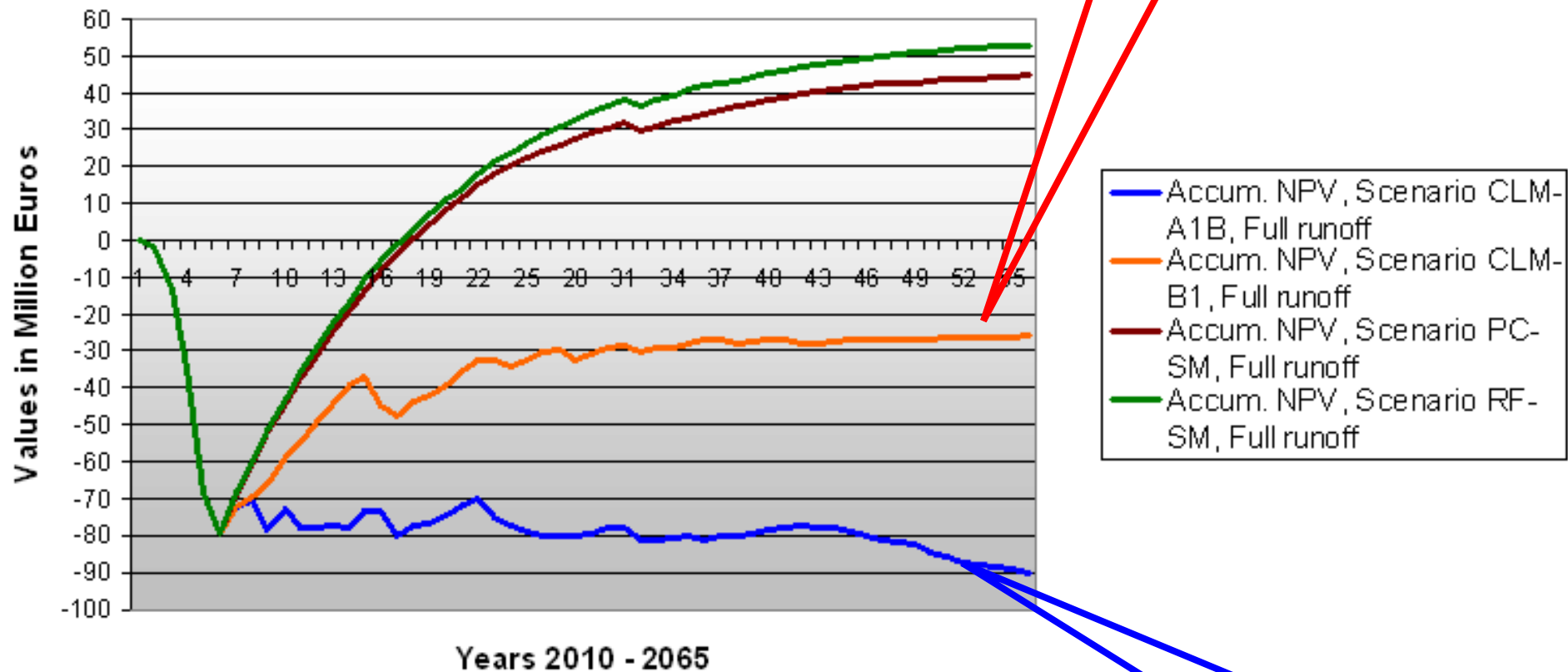
MODSUR/NEIGE
DISTRIBUTED
HYDROLOGICAL MODEL
250 m to 2 Km

- RIVER FLOW
- INFILTRATION
- EVAPOTRANS
PIRATION



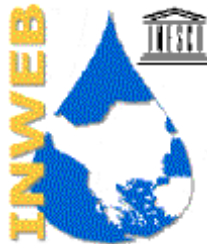
**B1
OPTIMISTIC**

Discounted Cumulative Cash Flow (Full runoff)



**A1B
REALISTIC**

IV International Symposium on Transboundary Waters Management Thessaloniki, Greece 15th – 18th October 2008



The “Thessaloniki statement”

THESSALONIKI STATEMENT

AT THE IV INTERNATIONAL SYMPOSIUM ON TRANSBOUNDARY WATERS
MANAGEMENT, HELD IN THESSALONIKI, GREECE, FROM 15-18 OCTOBER 2008,
WE THE PARTICIPANTS FROM 42 COUNTRIES AND INTERNATIONAL AND REGIONAL
ORGANISATIONS, HAVING

- reviewed the current situation of different transboundary surface and groundwater bodies;
- realised the common obstacles that in many cases detract from the best uses of those resources;
- recognised that the quantity and quality of those resources are affected by various human activities;
- considered that water resources are subject to the increasing influence of global and climate changes;
- considered the scientific, technical, economic, financial, policy and legal aspects involved in the management of transboundary water resources;
- recognised that it would be beneficial to broaden the scope of cooperation among states sharing water resources by involving the various stakeholders;
- recognised that transboundary water resources should be regarded as a common resource for satisfying the basic human as well as ecosystem needs and enhance sustainable socio-economic development of the basin populations;
- recognised that, in order to implement international legal obligations, it is necessary for states to take action within their domestic contexts;

COUNTRIES

SHOULD:

**ARE OF THE VIEW THAT IN ORDER TO FACE THE ABOVE CHALLENGES AND
MAXIMISE THE ADVANTAGES FROM COOPERATION AMONG COUNTRIES:**

1. The states sharing transboundary water resources should:
 - a. enter into agreements and understandings for cooperation in the management of these resources, consistent with principles of international law on water resources;
 - b. put in place sustainable institutional arrangements at the transboundary river basin or aquifer level;
 - c. put in place monitoring and evaluation mechanisms to continuously assess the transboundary river basins and aquifers;
 - d. enhance the knowledge base relating to these resources in order to develop effective water resources protection and management mechanisms;
 - e. explore alternative institutional approaches for the governance of transboundary water resources at the local users' level.
2. In order to implement international and regional legal obligations within their national contexts, states should put in place adequate national water management policies, legislation and institutions.
3. Arrangements should be made in order to build the capacity of states' multilateral, bilateral and national administrations to implement the provisions of the agreements entered into, and also to promote water education and organise multidisciplinary training programmes.
4. Sustainable financing mechanisms should be established for transboundary water management.

THEREFORE:

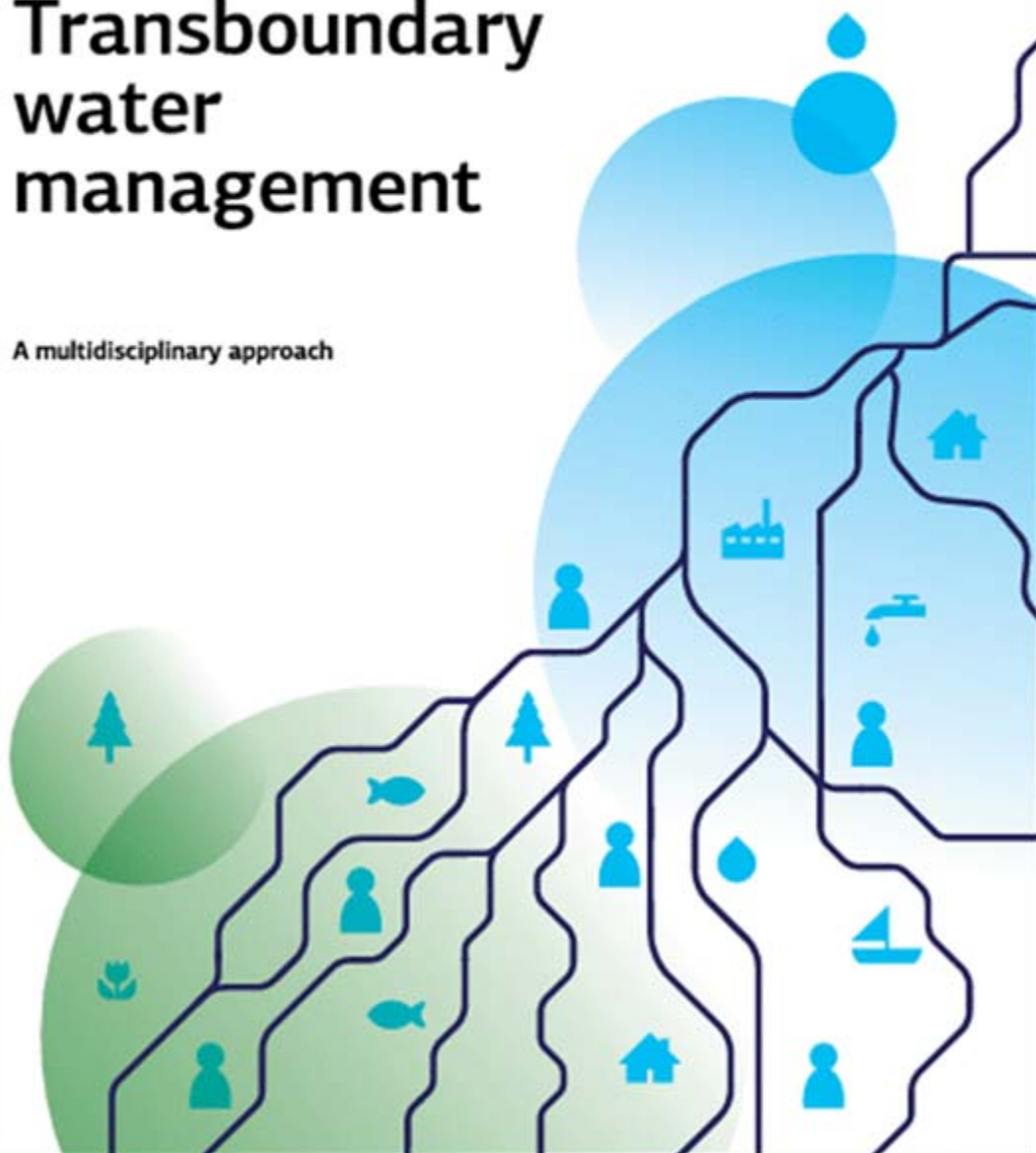
We the participants appeal to international institutions, as well as countries and regional and local authorities, in partnership with the private sector, for assistance, technical support and financing in these endeavours.

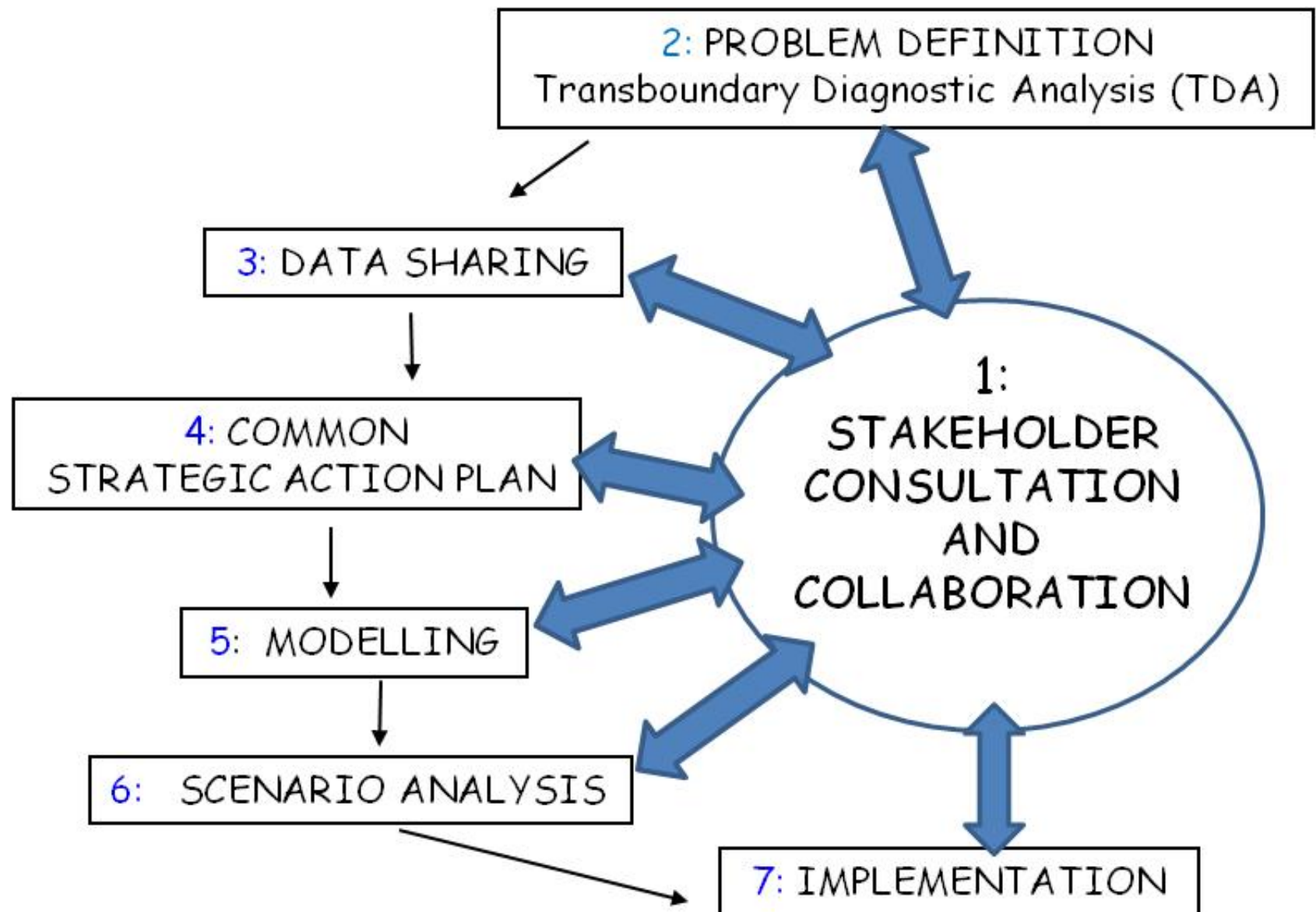
Edited by
Jacques Ganoulis,
Alice Aureli & Jean Fried

 WILEY-VCH

Transboundary water management

A multidisciplinary approach





6TH WORLD WATER FORUM

SD: 1. Ensure everyone’s well being

PfA: 1.5 Contribute to cooperation and peace

TSG: 1.5.2 Increase the number of new agreements and revise/enhance the quality of existing agreements related to transboundary surface and/or groundwater

QUESTIONNAIRE ON TRANSBOUNDARY LAKE/RIVER BASIN MANAGEMENT

The aim of this survey is to identify good practices in transboundary aquifer systems management and governance and to report successful case studies and innovative solutions to the 6th World Water Forum, Marseille, France, March 2012. It should take 10-15 minutes to complete the following questionnaire.

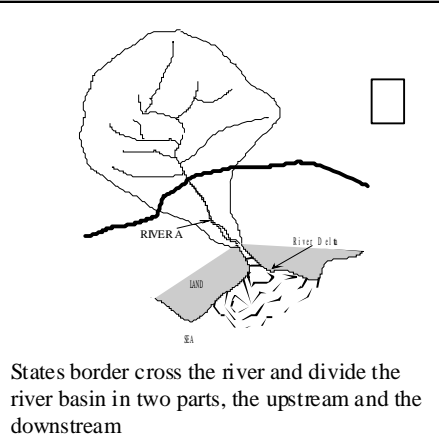
Please return it by e-mail to: iganouli@civil.auth.gr with copy to: l.salame@unesco.org

1. NAME OF THE TRANSBOUNDARY LAKE/RIVER BASIN, LOCATION & COUNTRIES

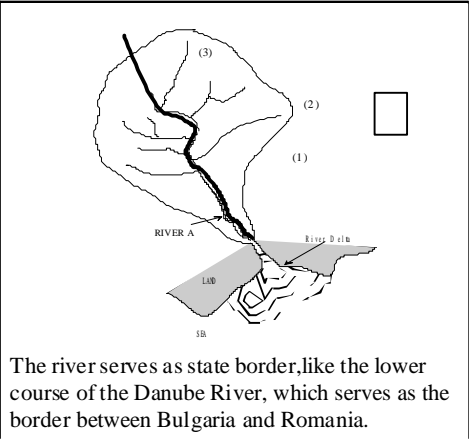
Please give the name(s) or other identification property of the shared basin, its approximate location (province, department) and countries sharing it.

2. RIVER BASIN CHARACTERISTICS

Please indicate which of the two pictures below characterises most closely your transboundary river basin.



States border cross the river and divide the river basin in two parts, the upstream and the downstream



The river serves as state border, like the lower course of the Danube River, which serves as the border between Bulgaria and Romania.

3. USES AND FUNCTIONS OF TRANSBOUNDARY SURFACE WATERS

Does the surface waters have direct/instream and/or indirect (offstream) uses?

No ☐ or Yes ☐ If Yes:

6TH WORLD WATER FORUM

SD: 1. Ensure everyone’s well being

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QUESTIONNAIRE ON TRANSBOUNDARY AQUIFER MANAGEMENT

The aim of this survey is to identify good practices in transboundary aquifer systems management and governance and to report successful case studies and innovative solutions to the 6th World Water Forum, Marseille, France, March 2012. It should take 10-15 minutes to complete the following questionnaire.

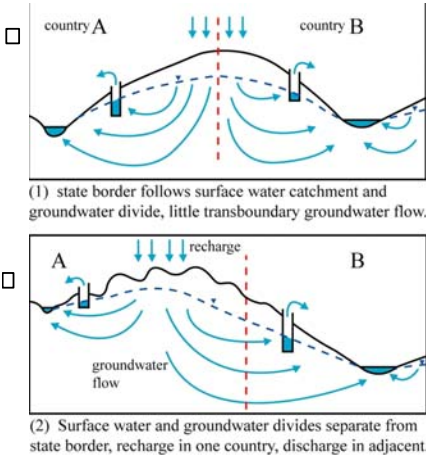
Please return it by e-mail to: iganouli@civil.auth.gr with copy to: l.salame@unesco.org

1. NAME OF THE TRANSBOUNDARY AQUIFER, LOCATION & COUNTRIES

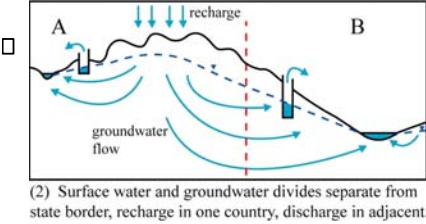
Please give the name(s) or other identification property of the shared aquifer, its approximate location (province, department) and countries sharing it.

2. AQUIFER CHARACTERISTICS

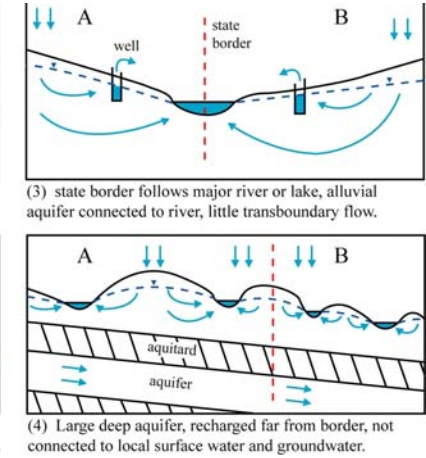
Please indicate which of the four simplified pictures below most closely characterises your transboundary aquifer.



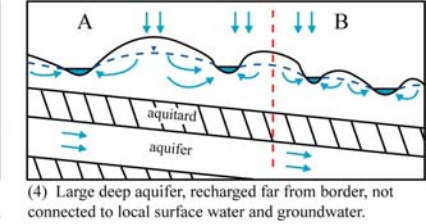
(1) state border follows surface water catchment and groundwater divide, little transboundary groundwater flow.



(2) Surface water and groundwater divides separate from state border, recharge in one country, discharge in adjacent.



(3) state border follows major river or lake, alluvial aquifer connected to river, little transboundary flow.



(4) Large deep aquifer, recharged far from border, not connected to local surface water and groundwater.

3. USES AND FUNCTIONS OF TRANSBOUNDARY GROUNDWATERS

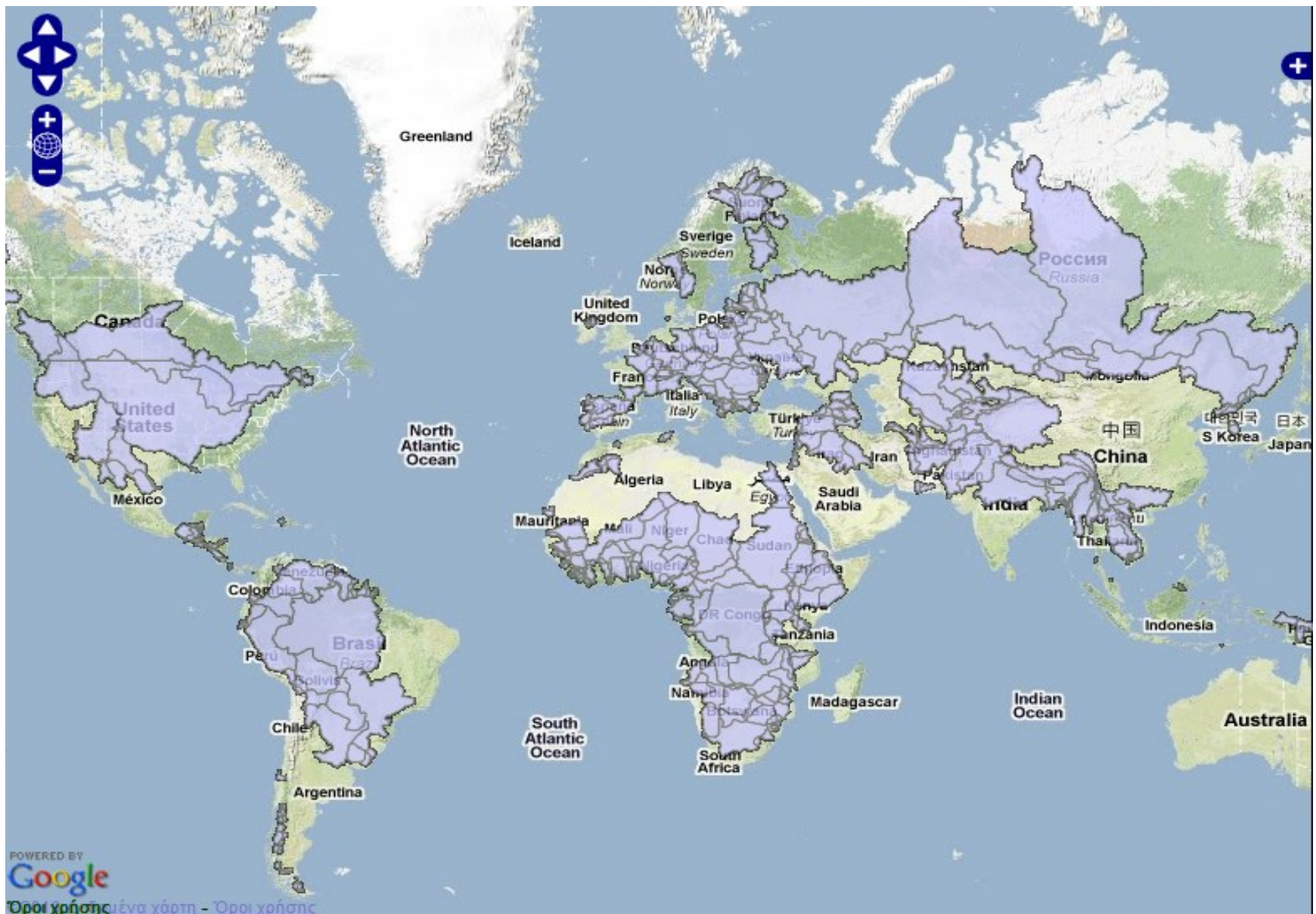
Does the groundwater in this transboundary aquifer have direct uses and/or other functions?

No ☐ or Yes ☐ If Yes:

A serene landscape photograph of a sunset over a body of water. The sun is low on the horizon, casting a warm, golden glow across the sky and reflecting on the water. In the foreground, there are tall reeds and a small, simple wooden boat partially submerged in the water. The background shows distant mountains under a clear sky.

Thank you!

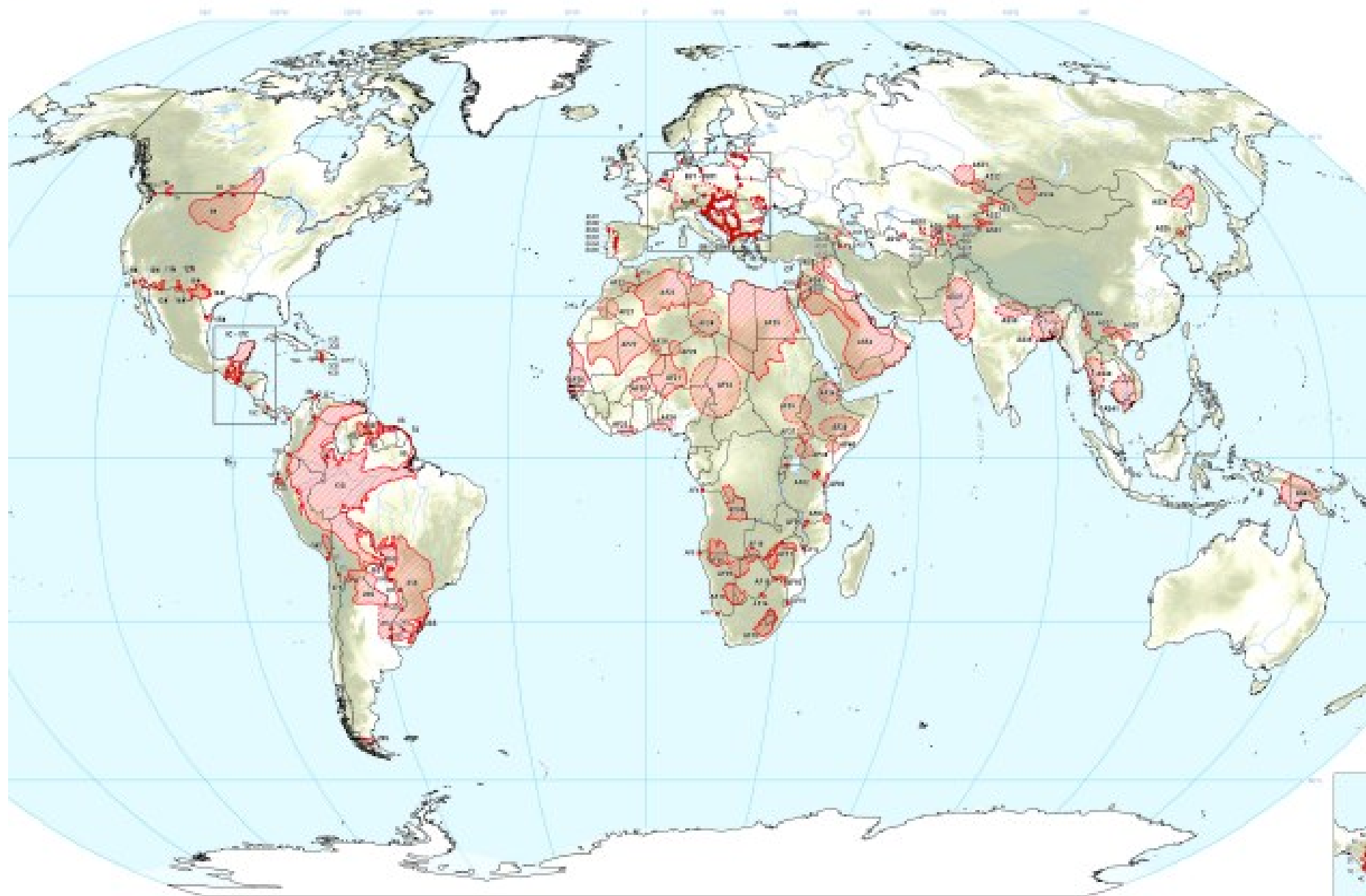
Ευχαριστώ!



THE WORLD'S TRANSBOUNDARY RIVER BASINS

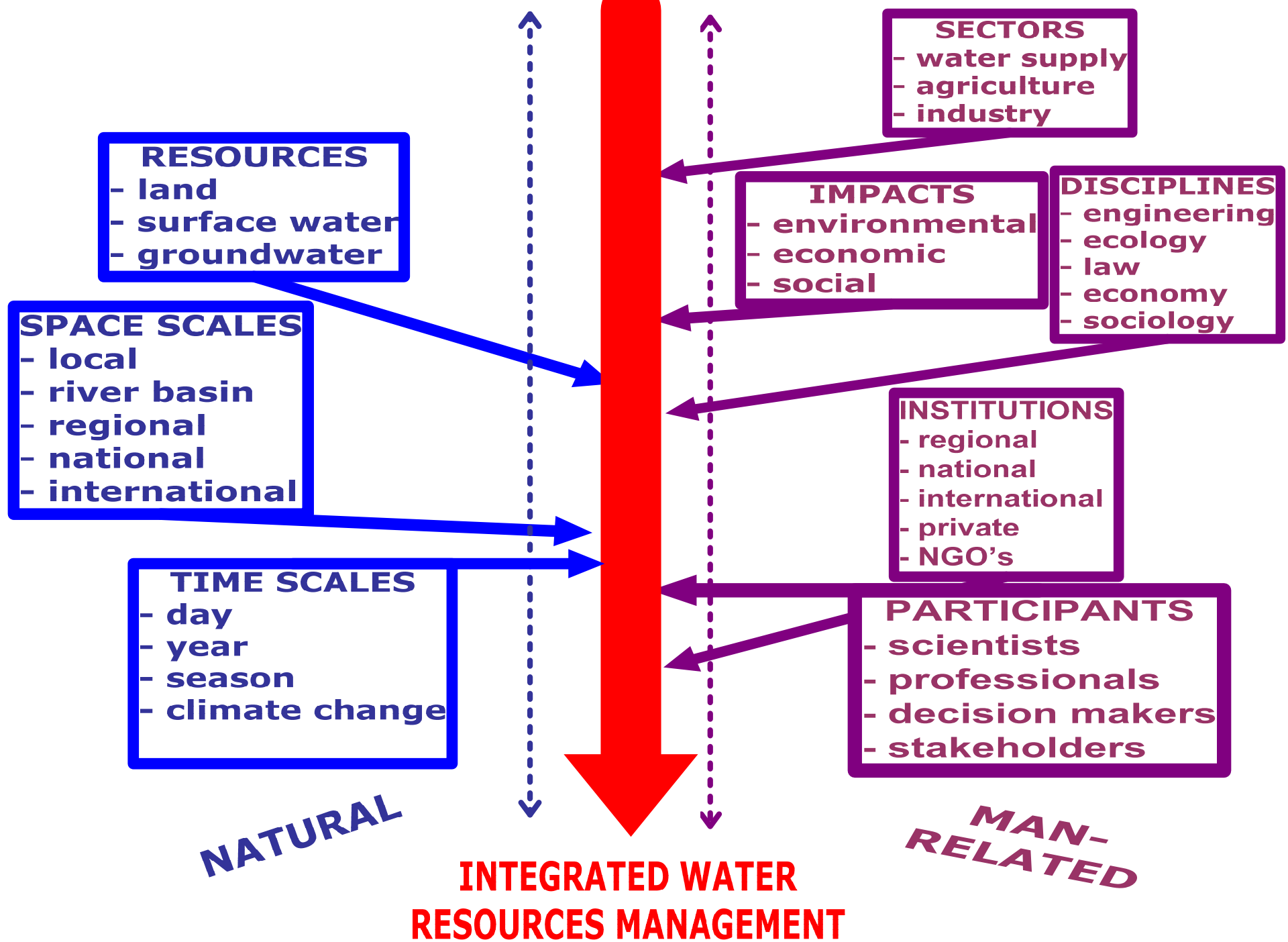
Transboundary Aquifers of the World

- Update 2009 -



TRANSBOUNDARY WATERS: THE FACTS

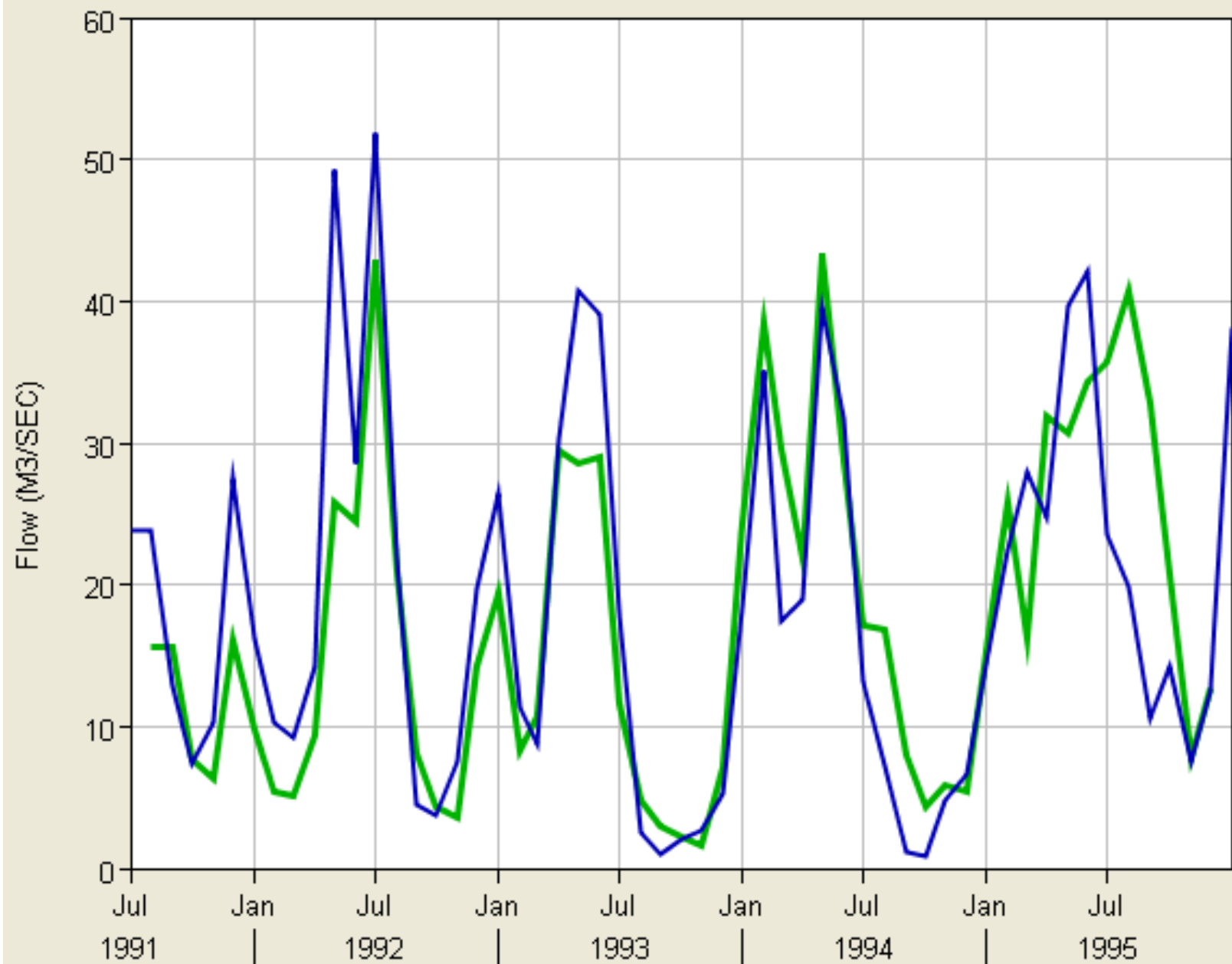
- Cover 45% of the land surface of the Earth;
- Affect 40% of the world's population;
- Account for approximately 80% of global river flow;
- Cross the political boundaries of 145 nations.



Breaking Multiple Barriers

Mainly Political Borders



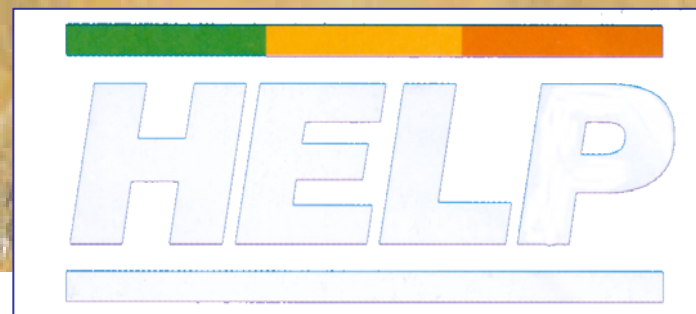


TBMENOS_FULL MODSURNG_V10M1 FLOW

TBMENOS OBS FLOW_MEDHYCOS

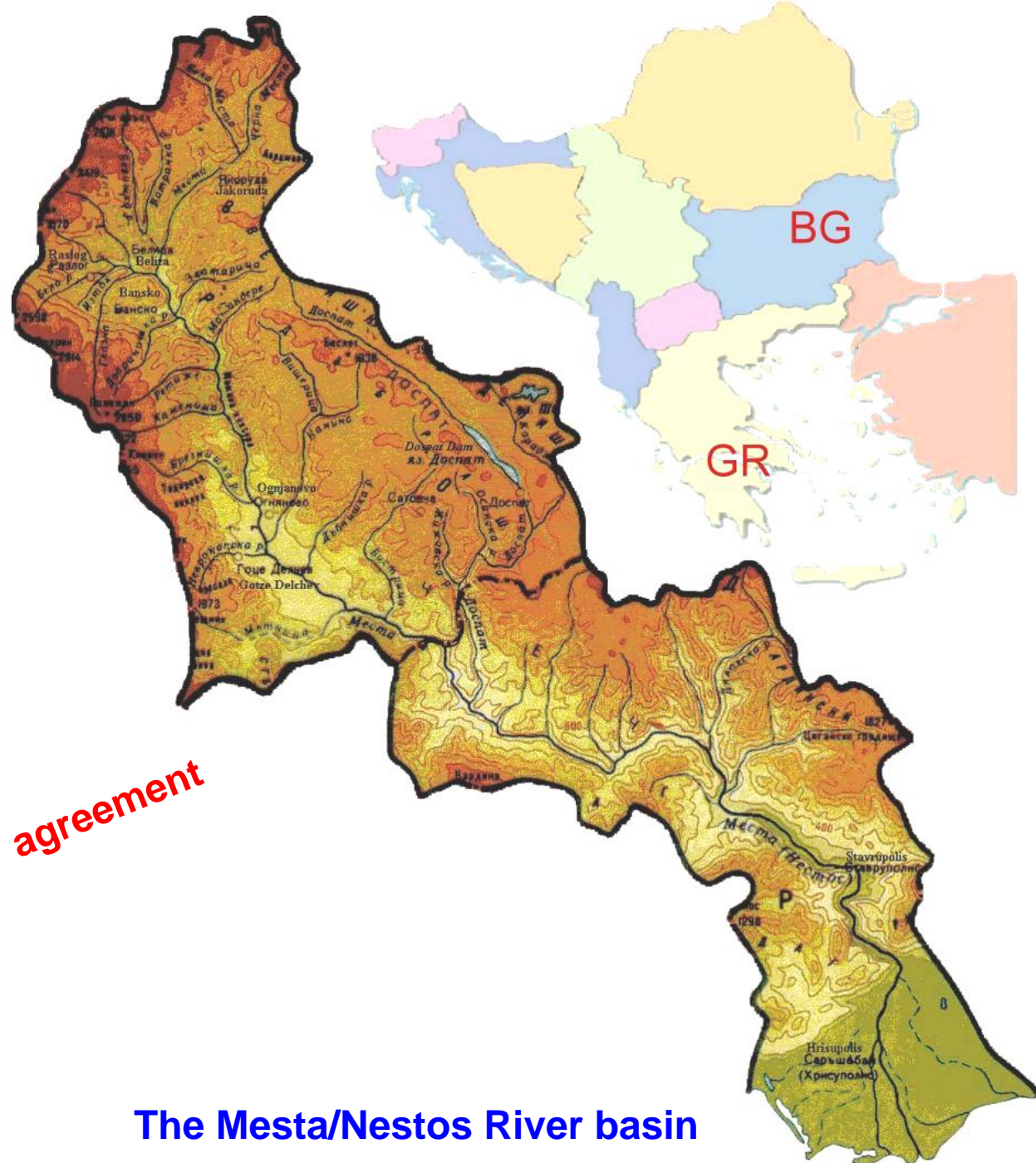


The Mesta/Nestos River Basin



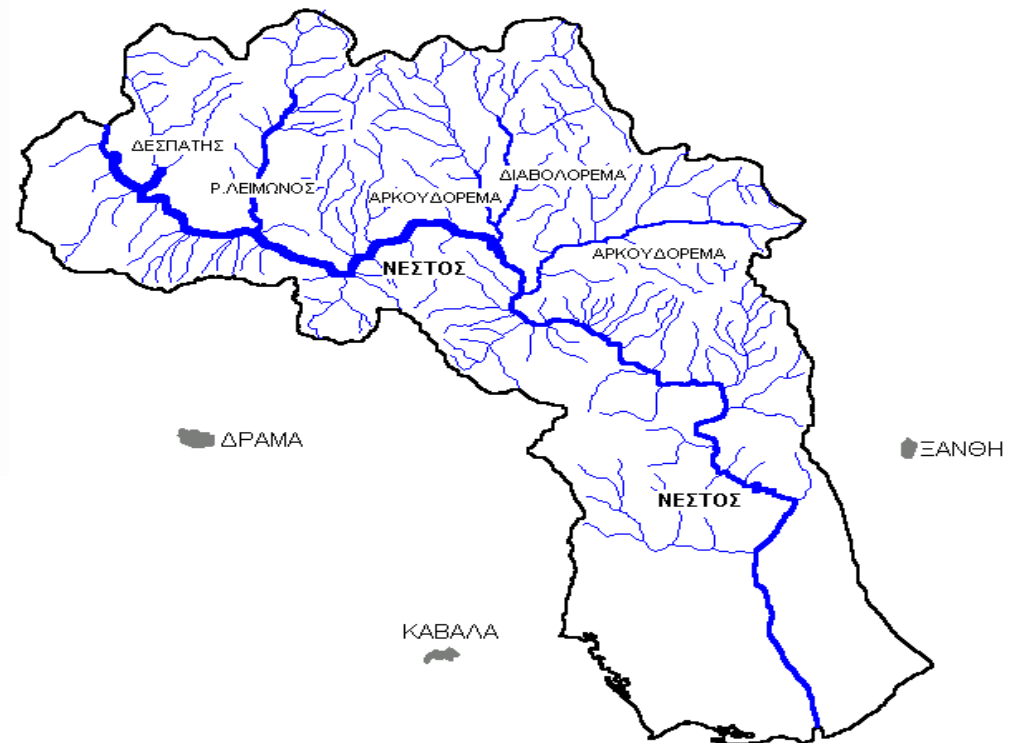
WWW.GREEKLANDSCAPE
SATELLITE IMAGE ©

... a bilateral agreement



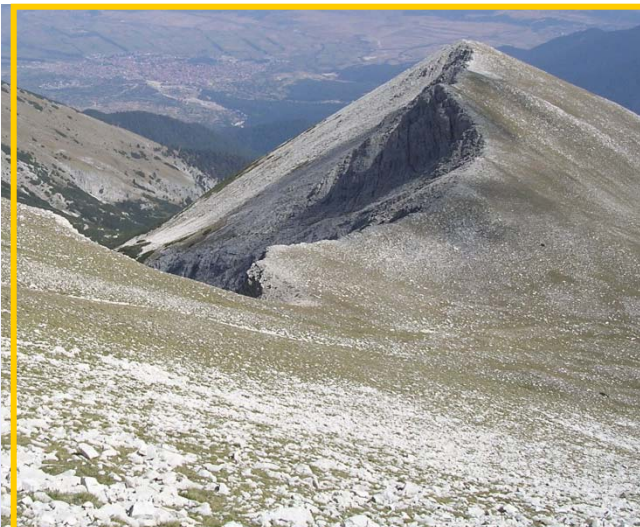
The Mesta/Nestos River basin

THE MESTA/NESTOS RIVER BASIN



Extensive construction activities



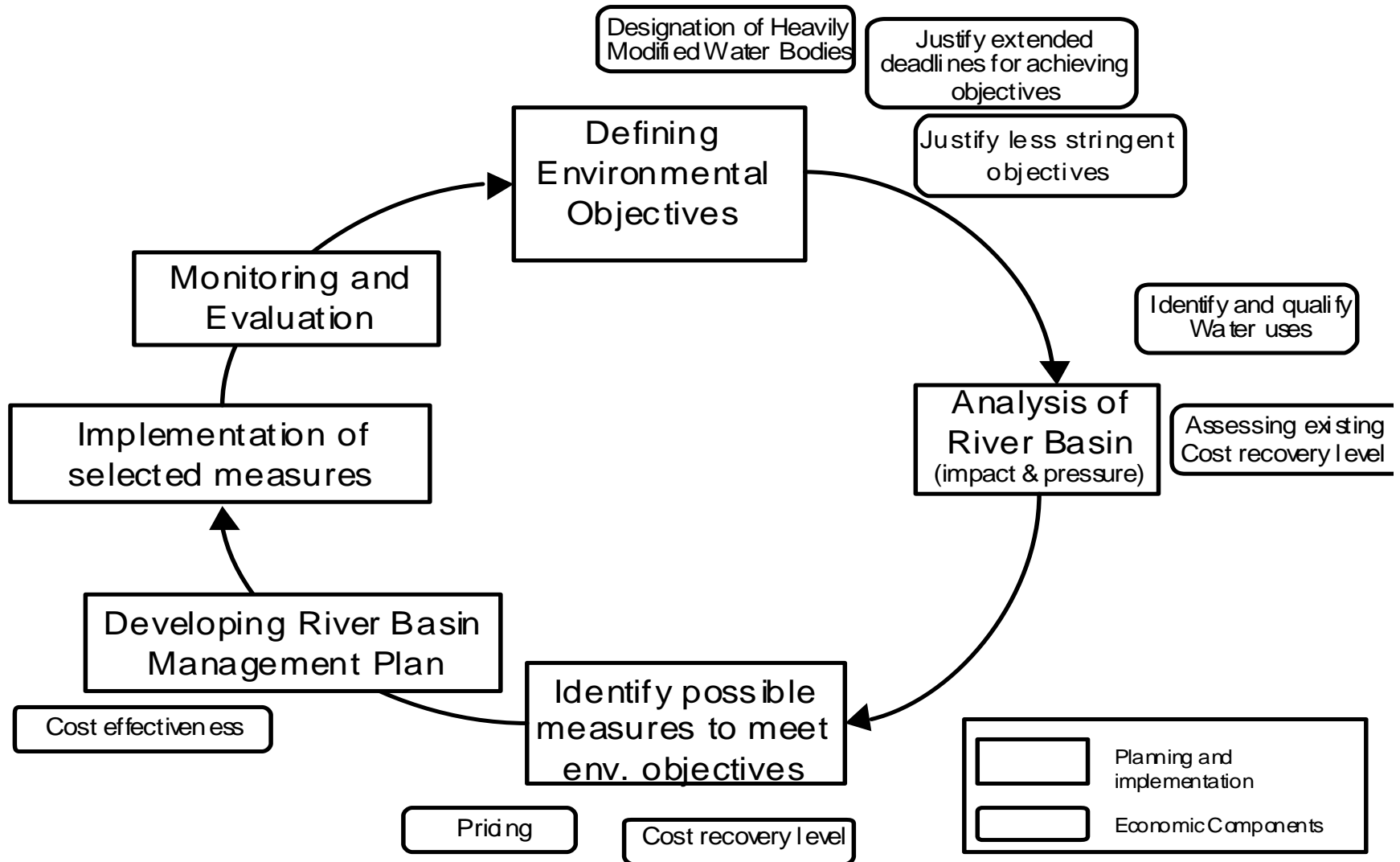


Nationalpark Pirin





Main Steps of the WFD Process & Role of Socio-Economics



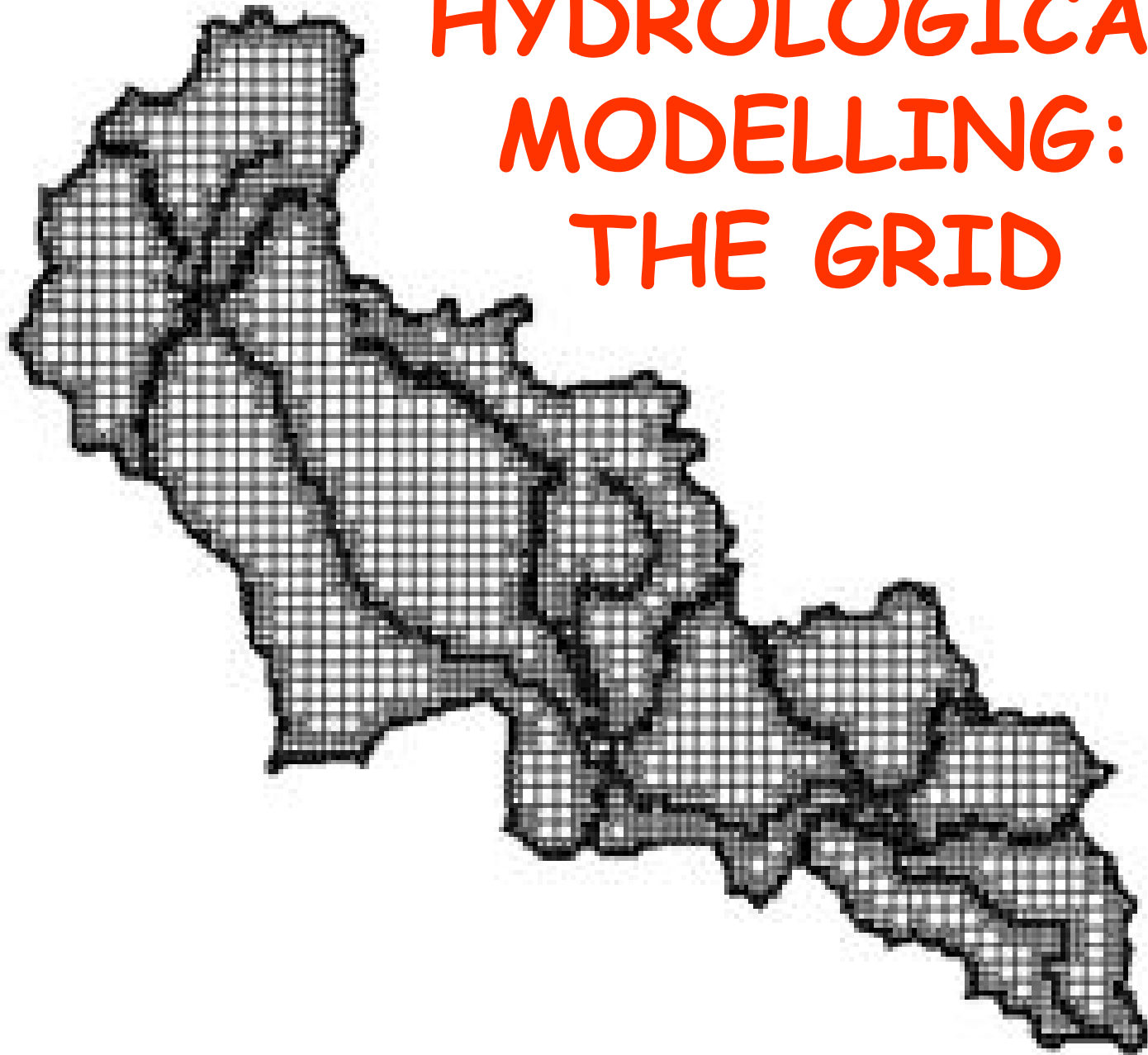
Central socio-economic aspects of the WFD: cost recovery

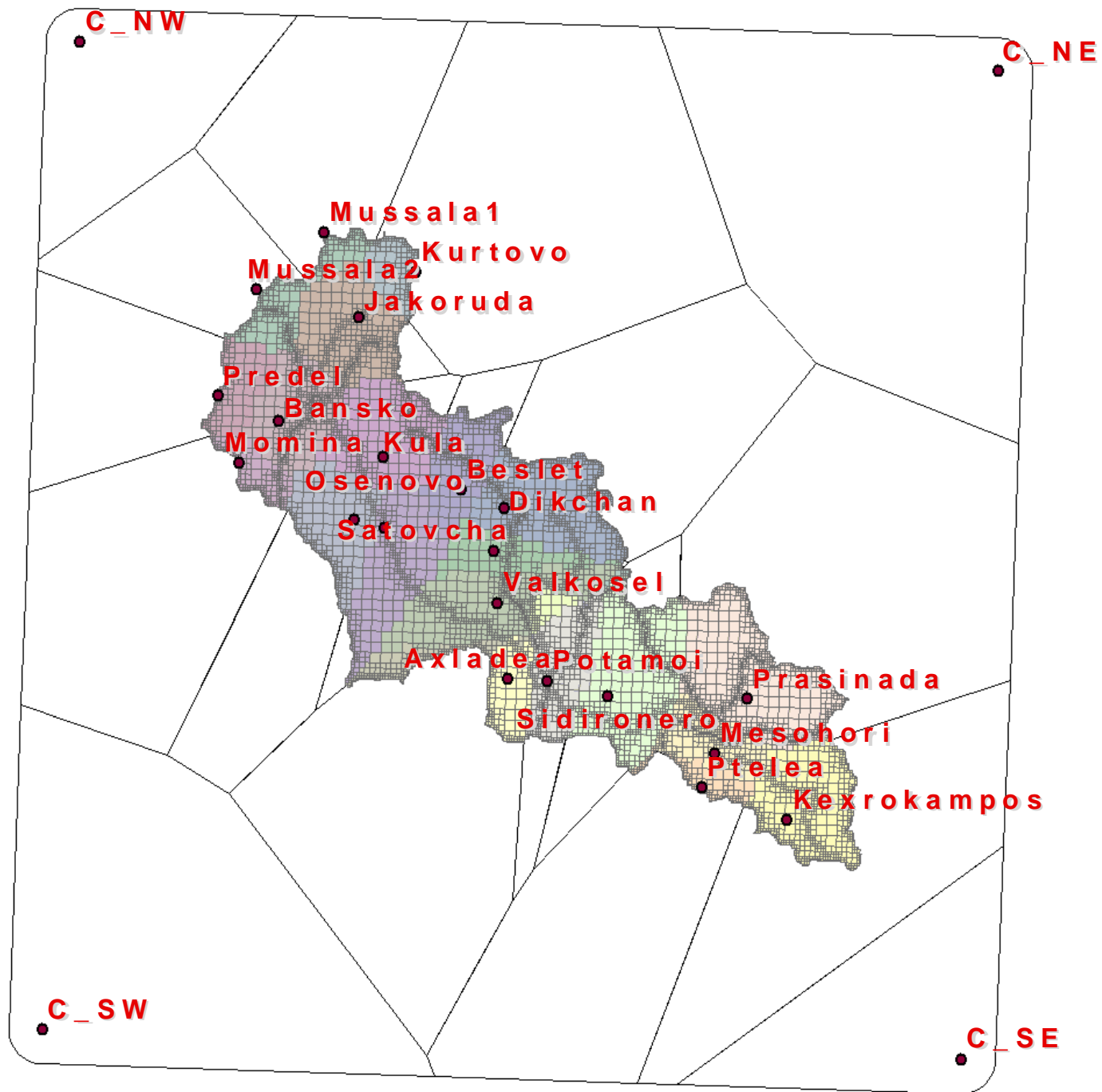
Member States shall take account of the principle of **recovery of the costs of water services**, including environmental and re-source costs [...] and in accordance in particular with the polluter pays principle.

Member States shall ensure by 2010
- an **adequate contribution** of the different water uses, disaggregated into a least industry, households and agriculture, to the recovery of the costs of water services“ (Art. 9 (1)).



HYDROLOGICAL MODELLING: THE GRID

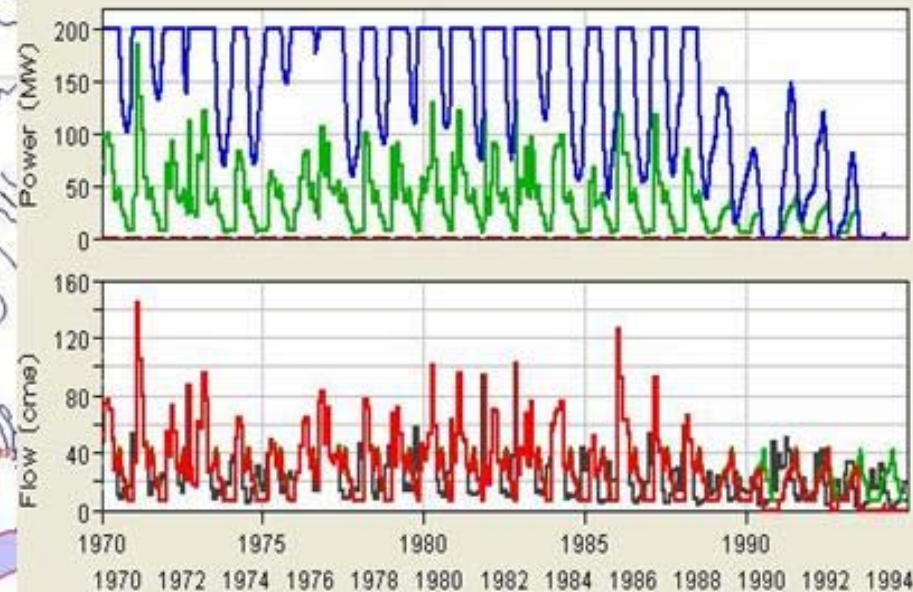




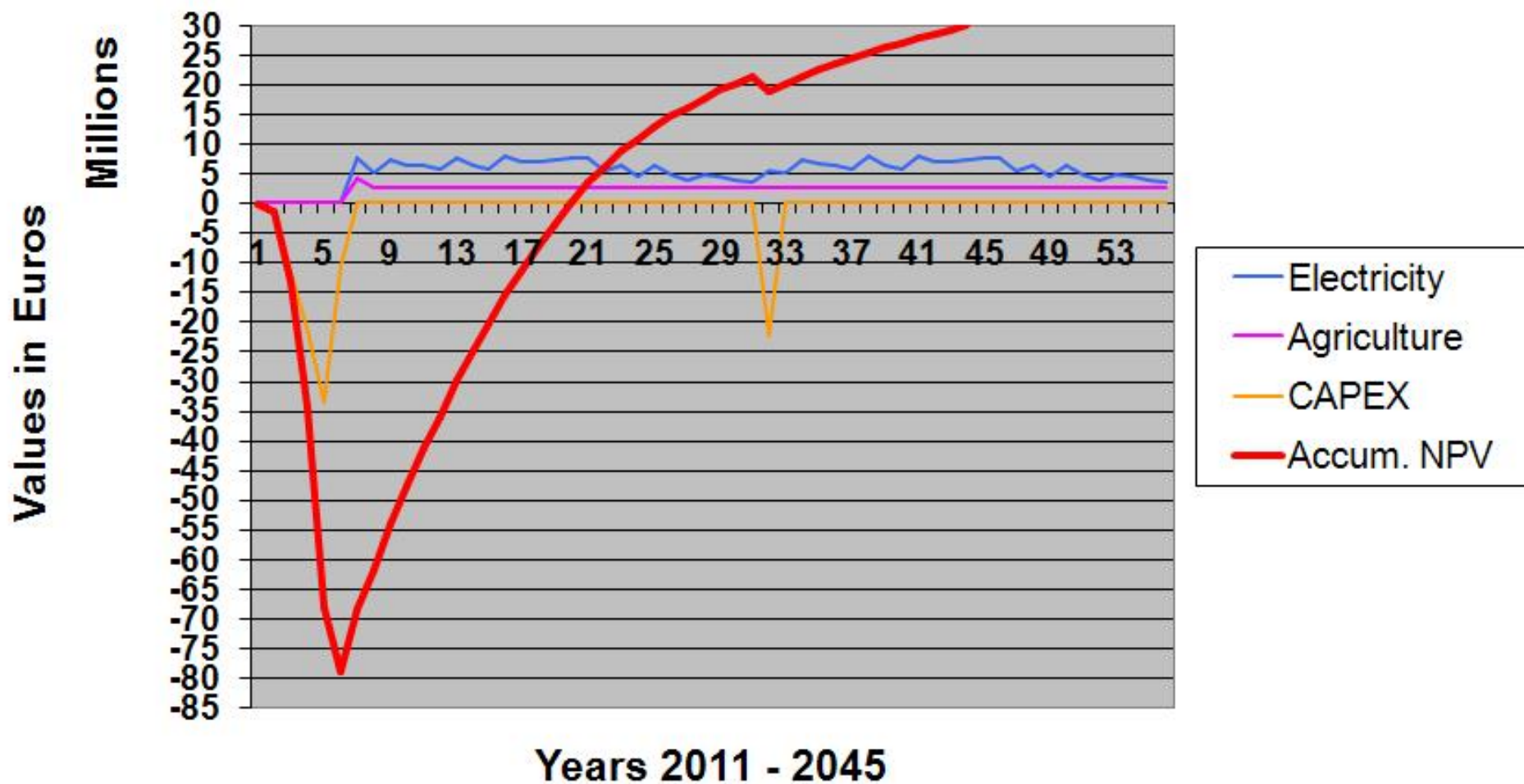
HYDRAULIC MODELLING: THE HEC-ResSim MODEL

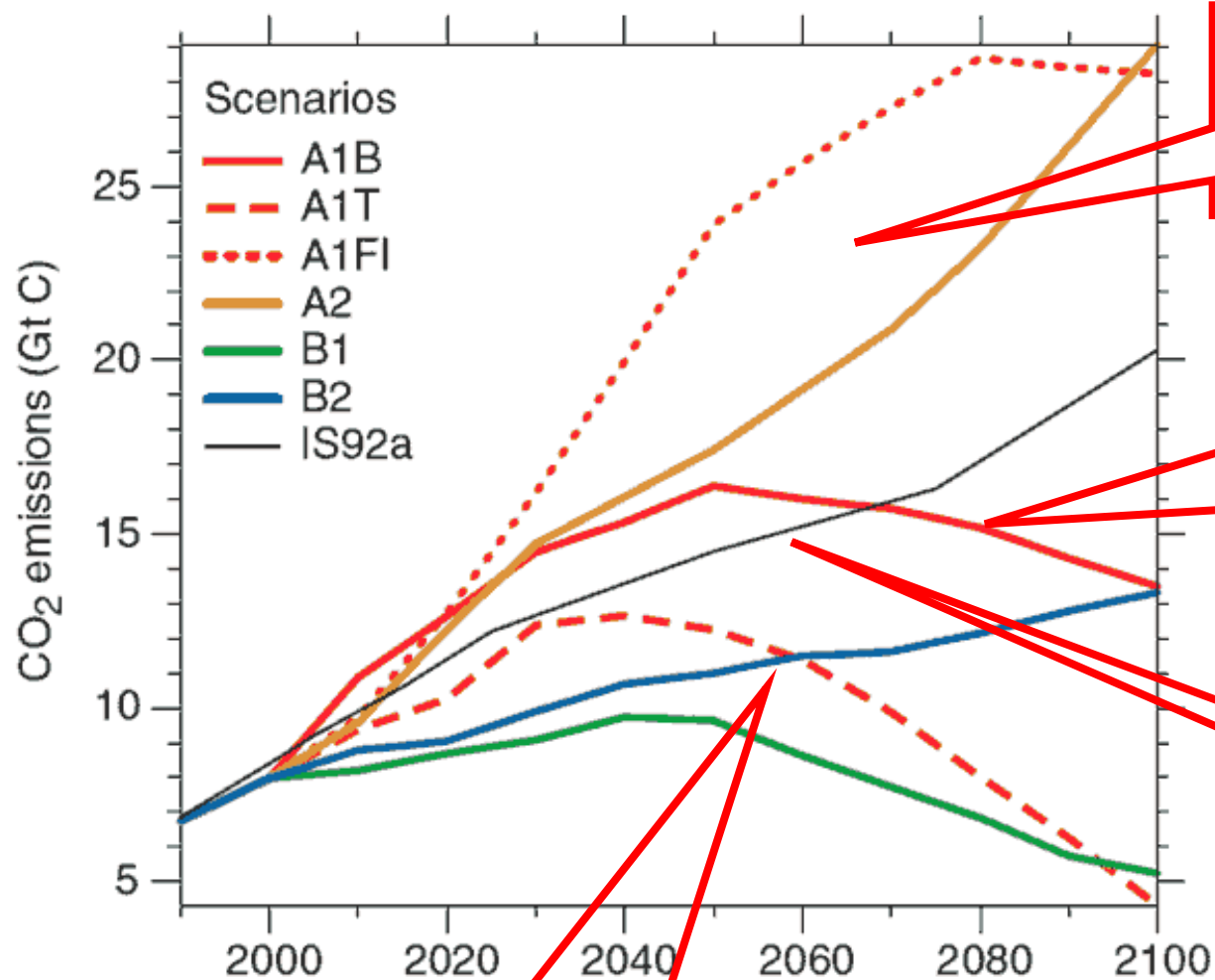


Dams of Nestos	Level of tailrace tunnel (m)	Power (MW)
Thissavros	226	300
Platanovryssi	151	100
Temenos	126	20



Discounted Cumulative Cash Flow





**HUGE
INCREASE OF
CO₂ (A1FI,A2)**

**A1B
REALISTIC
REDUCTION
OF CO₂**

**IPCCP
SAR (IS92a)**

**OPTIMISTIC
NEW TECHNOLOGIES)
(B1,B2)**

CONCLUSIONS

- COMMUNICATION STRATEGIES TO INVOLVE STAKEHOLDERS:
SIMPLCITY, PERSISTENCE & USE OF NEW ICTs

(examples: monitoring, common databases, integrated modelling,
common management plans)

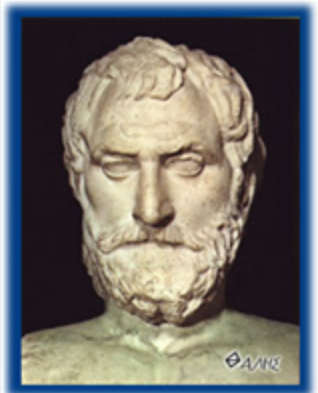
- IMPORTANCE OF SOCIO-ECONOMICS, CLIMATE CHANGE & ANALYSING
THE DECISION MAKING PROCESS

(examples: sharing risks & benefits, multicriteria decision analysis)

‘Υδωρ πάντων ἀρχή’

Water is the origin of everything

Thales of Miletus
Greek philosopher, 600bc



"Humanity is not determined by what is developing, but by what chooses not to destroy"

Edward Osborn Wilson (1929-)
American biologist

