

**TRANSBOUNDARY WATER  
RESOURCES MANAGEMENT IN  
EUROPE WITHIN THE  
FRAMEWORK OF WFD 2000/60**

**Y. Mylopoulos**

**ARISTOTLE UNIVERSITY OF THESSALONIKI**


**Dept. of Civil Engineering**

**Division of Hydraulics and Environmental Engineering**

# Transboundary water resources

- 40% of the world's population live in transboundary catchment areas, shared by more than one country
- The political dimension of Water becomes highly important
- Need for concerted management and harmonization of policies

# Transboundary water resources

- Water should be managed in an internationalized way, integrating methodologies and techniques from the areas of international relations and diplomacy
  - Sustainable Development introduced the need for the Green, or Environmental Diplomacy
  - Principles of “Hydrodiplomacy”
  - Need for Conflict Resolution Methods
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# Transboundary Water Management in Greece

- Major issue for Greece
- Downstream country in 4 out of the 5 shared rivers
- 25% of the country's renewable resources are imported
- The management policy of the upstream countries affects directly the development and the environmental protection downstream

# Legal Framework

- 1992: UNECE Convention, "The Protection and Use of Transboundary Watercourses and International Lakes"
- 1997: UN Convention, "Convention on the Law of the Non-navigational Uses of International Watercourses"
- 2000: Directive 2000/60 of the European Parliament and of the Council of 23 October 2000, establishing a framework for Community action in the field of water policy, "Water Framework Directive"

# TRANSBOUNDARY WATER MANAGEMENT ACCORDING TO THE WFD

- River Basin Management and Integrated Water Management are introduced, not only for the EU countries, but also for the countries having boundaries with them
- A common framework is provided between neighbor countries, for the co-operation, planning and management of water resources

# Nestos/Mesta Basin



✓60%-40%

6,280 km<sup>2</sup>

✓230 km

✓176,000 population

✓Mainly covered with forests

✓People are mainly occupied in the primary sector

✓Protected areas (Delta, Nestos Pass, Pirin National Park)

# The Reference Area

**Main economic activities: agriculture, forestry, power industry, cattle breeding and recreation.**

- **Agriculture**

Water source: Nestos river

4 irrigation systems (2 GR-2 BG)

GR: total irrigated land ~130km<sup>2</sup> at the Delta region

BG: total irrigated land ~175km<sup>2</sup>

- **Hydropower**

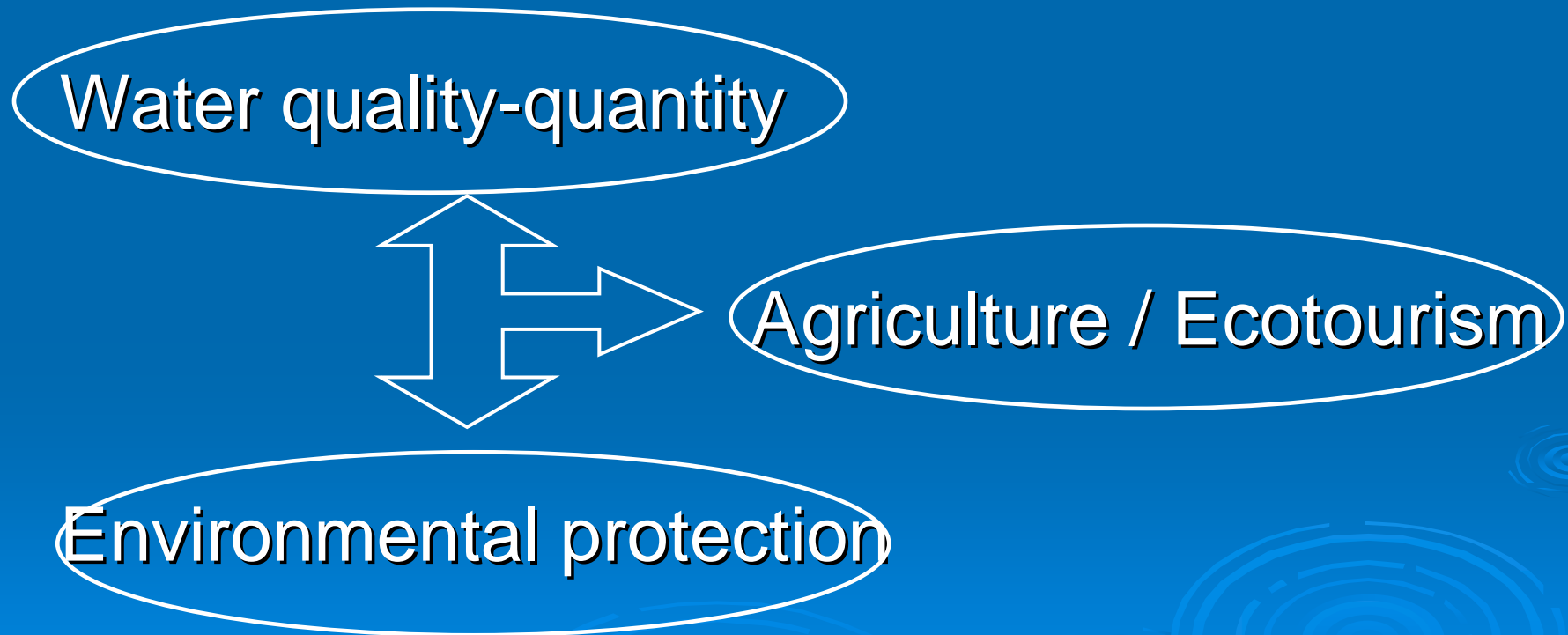
2 dams constructed in GR (425GWh)

3 dams in progress in BG (7.4 KWh)



# The Reference Area

## *Problems – Objective analysis*



# The Greek- Bulgarian case study

- Different socio-economic conditions between the two countries
- The political situation with the transition phase to the free market - economy in Bulgaria is still unclear
- No common water management and environmental protection plans have been established
- No joint monitoring systems along the river exist
- Lack of integrated water management & allocation

# The G-B Agreement of 1995

- 29% of the river flow to be received by Greece
- Exchange of information
- Establishment of a cross-border Committee
- Enforcement period: 35 years

# Compliance With the WFD

## WFD

- River Basin Level
- Economic analysis of water use
- River Basin Management Plan
- Public Participation

## G-B Agreement

- ⇒ Nestos River
- ⇒ No reference
- ⇒ No preparation
- ⇒ Only authorities involved

# European projects



[www.ironcurtainproject.com](http://www.ironcurtainproject.com)

## IRON CURTAIN 2001-2004

5th Framework Programme "Quality of Life and Management of Living Resources"

Key Action 5 "Sustainable Agriculture, fisheries and forestry and integrated development of rural areas including mountain areas"



[www.transcat-project.net](http://www.transcat-project.net)

## TRANSCAT 2003-2006

5th Framework Programme "Energy, Environment and Sustainable Development"

Key Action 1 "Sustainable Management and Quality of Water"



## THE IRON CURTAIN PROJECT

5<sup>th</sup> Framework Programme 'Quality of Life and Management of Living Resources'

EC-Project Contract No: OLK5-CT-2001-01401



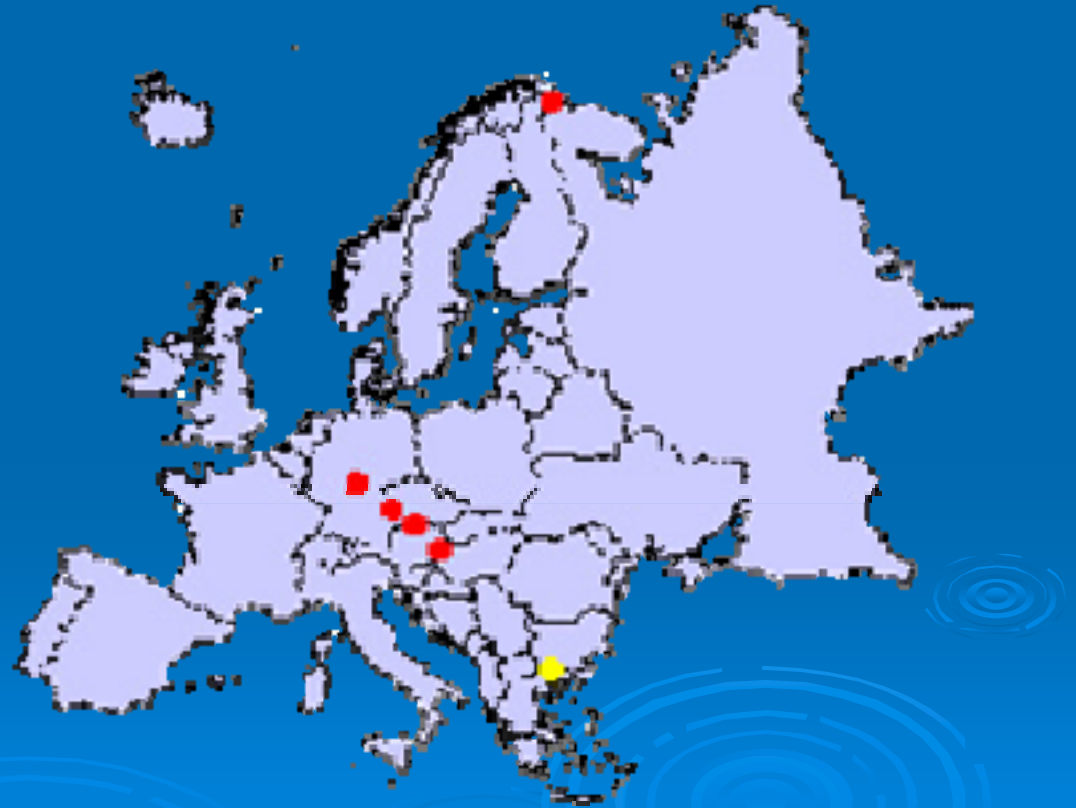
**Title:** INNOVATIVE MODELS OF CRITICAL KEY INDICATORS AS PLANNING AND DECISION SUPPORT FOR SUSTAINABLE RURAL DEVELOPMENT AND INTEGRATED CROSS BORDER REGIONAL MANAGEMENT IN FORMER IRON CURTAIN AREAS BASED ON NORTH TO SOUTH EUROPEAN REFERENCE STUDIES



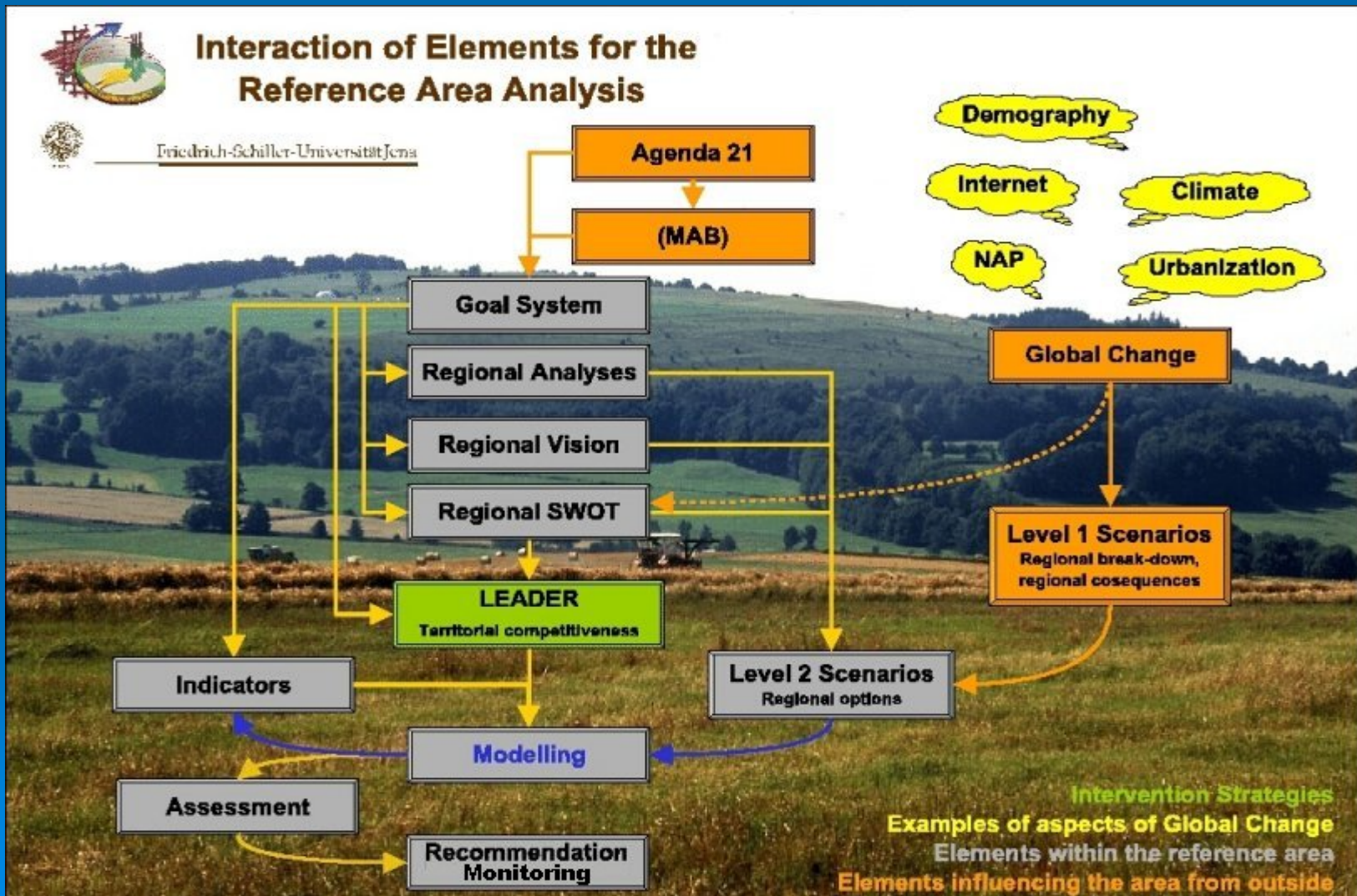
**Objective:** Development of a methodology leading to standardized tools and procedures for integrated resource evaluation, analysis and management following the principles of sustainable development

# Main features

- ✓ 2001-2004
- ✓ Six pilot areas
- ✓ Participants from eight countries
- ✓ Harmonization of methodologies
- ✓ Bilateral cooperation



# Methodology



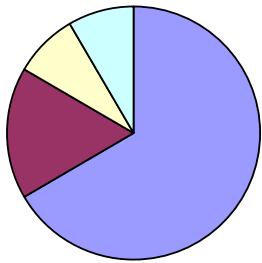


# Application

- Logical Framework approach (stakeholders, problems and objectives analysis)
- Regional analysis (Data collection, GIS, land uses)
- SWOT
- Indicators
- Development scenarios (water-environment-agriculture)
- Modeling (Emergy analysis)

# Goal system

## Stakeholder groups



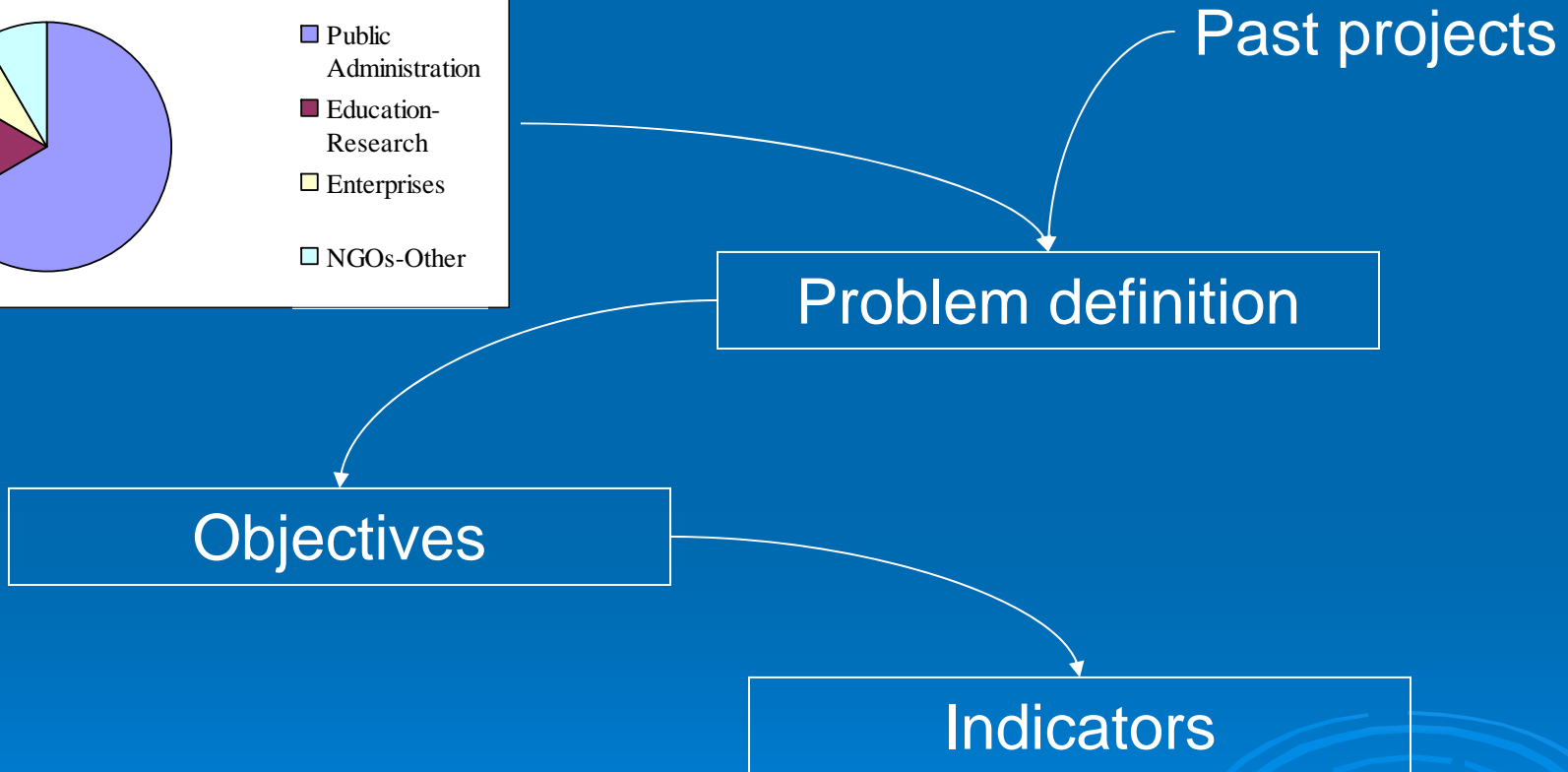
- Public Administration
- Education-Research
- Enterprises
- NGOs-Other

Past projects

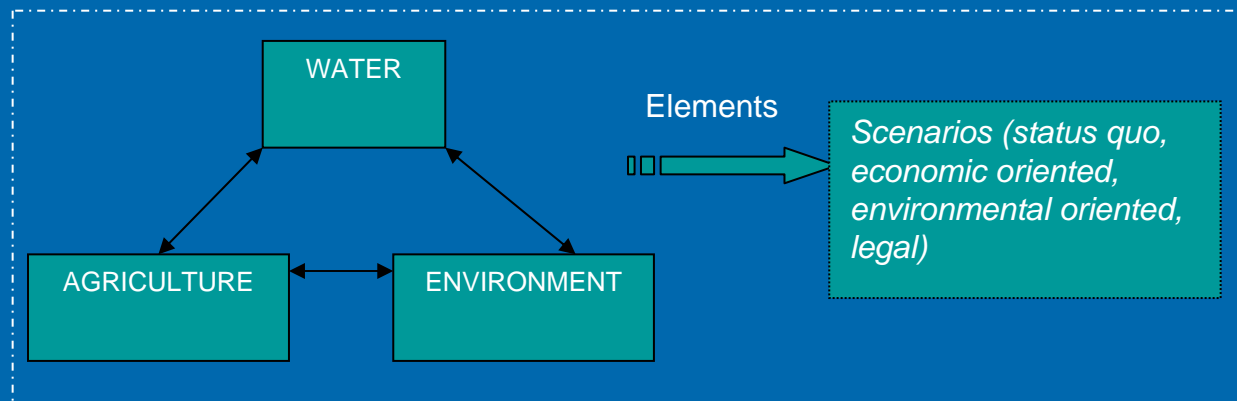
Problem definition

Objectives

Indicators



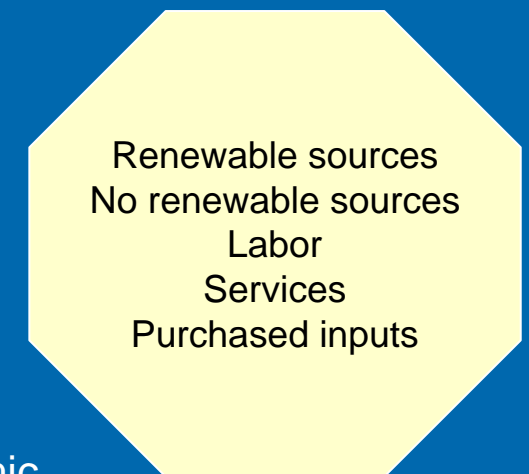
# Modeling



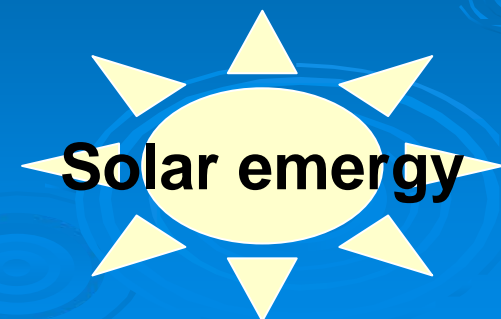
## Major conclusion:

### Increased profitability by sustainable use of resources in optimized crop mix

- the ecological scenario is generally more sustainable than the economic ones
- legal scenario shows considerable improvements in relation to sustainability compared to the status quo (considerable short term alternative)



## Transformities



WEYR Water energy yield ratio per ha  
NED Non-renewable empower density/ha  
ELR Environmental Loading Ratio per ha  
EYR Energy yield ratio

# Conclusions

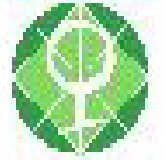
- Information and education of farmers about the economic sustainability of crop production
- Integrated evaluation of agricultural practices using, both economic and environmental, cost-benefit analysis
- Changes in crop mixes can lead to higher profit, less water demand and higher Sustainability Index. Social impacts should not be ignored
- Evaluation of effects in current water uses from alterations in river flow

**Need for inter-sectoral integration**

# Conclusions

- Effective cooperation based on the principles of good neighborliness and reciprocity
- Thorough water mass balance can provide information for the allocation of the water
- Amelioration of the infrastructure
- Alterations in current agricultural practices (to more sustainable ones)
- Plan for ecosystem management
- Local actors involvement

**Need for transboundary integration**



# Objectives

## Main objective:

Creation of an operational and integrated comprehensive DSS for optimal water management in borderland regions, in compliance with the WFD

## Sub-objectives:

- Identification of conflicts
- Analysis of legal framework
- Bilateral cooperation & exchange of data



# First results

- Meetings with stakeholders
- Cross-border Steering Committee Meeting
- European platform for co-operation
- Development of DSS prototype
- Water-related Indicators

# TRANSCAT DSS

Data Management  
Data Visualization

+

Modeling Tools  
(Quantity, Quality)

+

Decision Analytic Tools  
(MCDM Tools, Mulino)



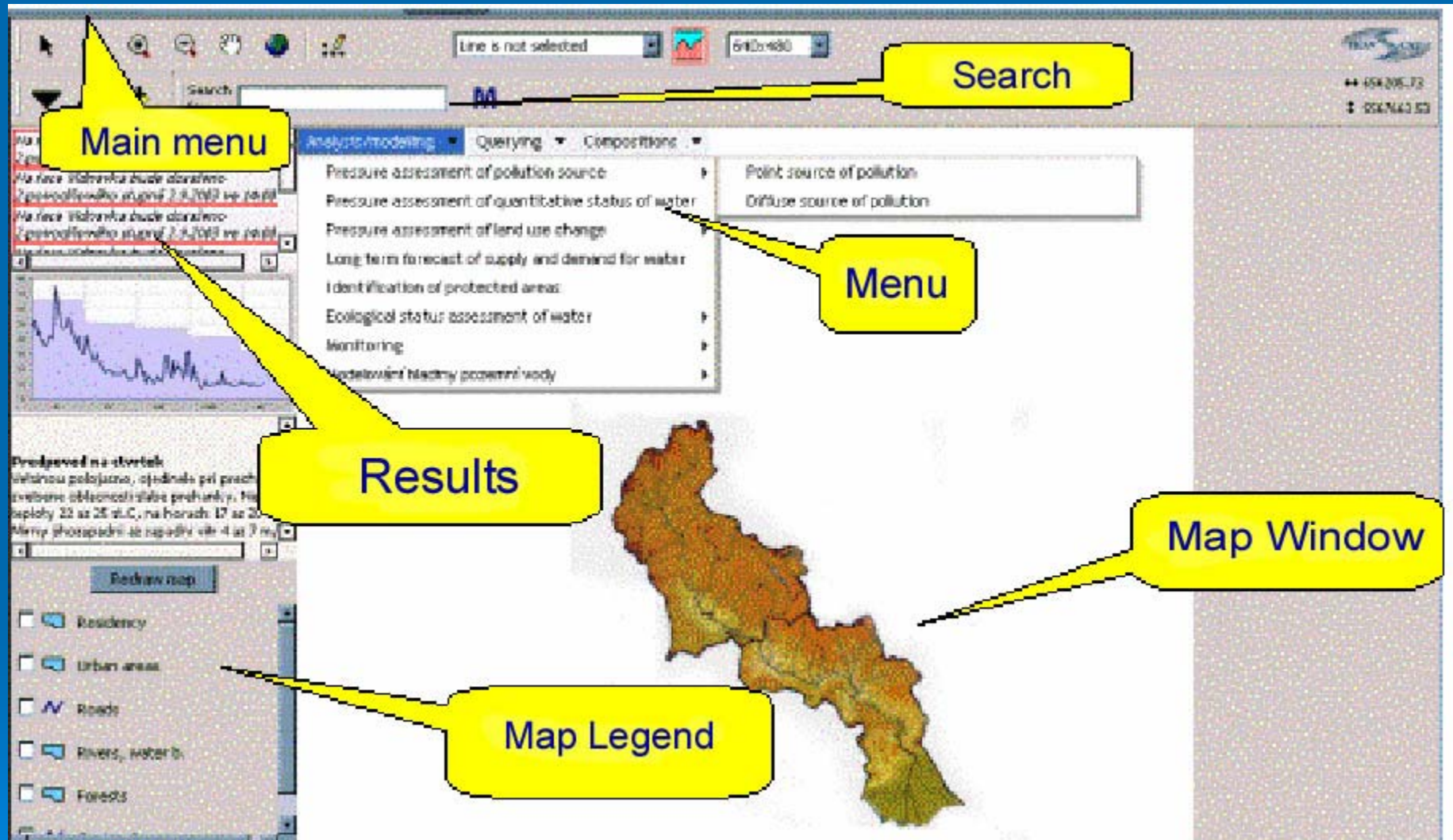
**TRANSCAT**  
**Decision Support**  
**System**



Implementation to 5  
Pilot Areas



# DSS PROTOTYPE



# Conclusions

- Lack of integrated management approach
  - Need for common vision, methodologies
  - Public Participation
  - Conflict Resolution
  - Political willingness for cooperation
  - Inter-country confidence
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