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Justification: The Mediterranean Context

- **Water resources are limited and scarce**
- **Drought and water scarcity have dramatic effects on the economy and the environment**
- **Most countries react to a drought by responding to immediate needs and by providing costly emergency remedies**
- **Lack of permanent structures and plans to cope with drought**



- Over 400 million people. Regional heterogeneity
- Population dynamics, urbanization
- Large public and private expenses in infrastructure
- Competition for water
- Environmental stress
- Economic pressures and globalization

OBJECTIVES

- **Provide Guidelines for Drought Preparedness Plans**
 - Integrated approach to minimize the impacts of drought and to change the way of facing droughts from Crisis Management to Risk Management
 - Adapted to the physical and socio-economic environment Mediterranean countries
 - Follow a common methodology
- **Provide the framework for the setting up of a Drought Preparedness Network for the Mediterranean countries**

EXPECTED RESULTS

- **Guidelines for Drought Preparedness Plans**
- **Better understanding of drought, its causes, and its social, economic, and environmental effects**
- **Transfer and exchange of know-how, technology, information, and expertise**
- **Strengthen the institutional capabilities and raise awareness and commitment**



The Process

Water supply

1. Build from extensive knowledge in drought management
2. Take into account the legal, social, and political process
3. Incorporate science into drought management: education, awareness, and outreach

Agriculture



Thematic Linkages

Thematic Linkages with issues relevant to MEDROPLAN	Synergies with knowledge produced in other MEDA-Water Projects
Analysis of Institutions and organizations relevant to water scarcity and drought management	ISIIMM, EMPOWERS
Integrated management among competing users	EMPOWERS, EMWATER
Urban water	zerO-M, MEDAWARE
Agricultural water	ISIIMM, MEDAWARE, IrWa, EMWA
Technological development	zerO-M, ADIRA EMWATER, MEDAWARE, EMWA

ISIIMM, MEDAWARE, ADIRA, IrWa, EMWA, MEDROPLAN
zerO-M, EMPOWERS, EMWATER

Geographic Linkages

MEDROPLAN Country Partners	Other MEDA Project
Cyprus	MEDAWARE
Greece	zer0-M, MEDAWARE, ADIRA
Italy	ISIIMM, zer0-M, IrWa, EMWATER
Morocco	ISIIMM, zer0-M, MEDAWARE, ADIRA
Spain	ISIIMM, MEDAWARE, ADIRA, IrWa, EMWA
Tunisia	zer0-M

ISIIMM, MEDAWARE, ADIRA, IrWa, EMWA, MEDROPLAN
zerO-M, EMPOWERS, EMWATER

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WP1: Map Organizations and Institutions Guidelines

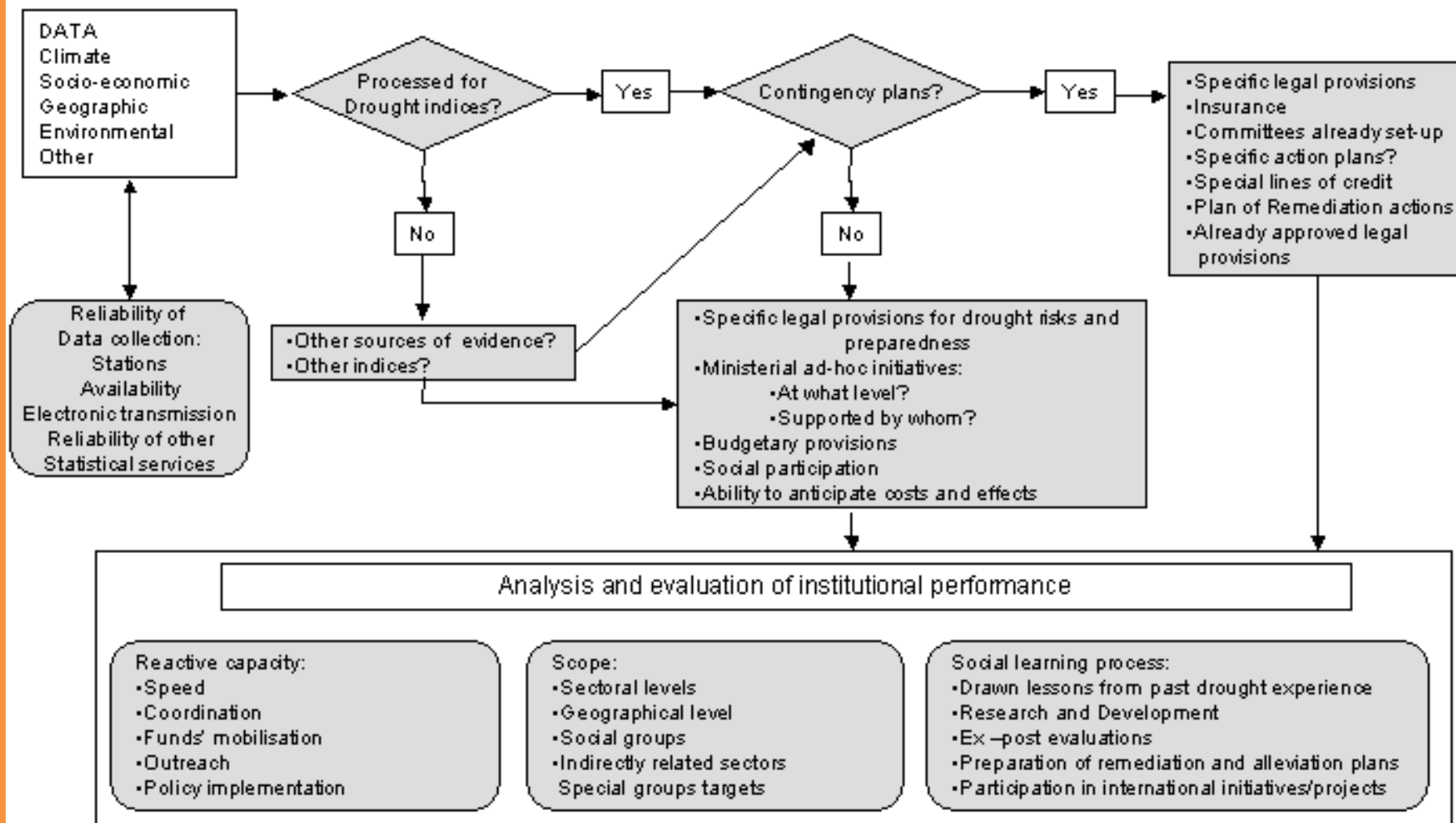
1. Mental model of organizations and institutions

- Data and information systems
- Legal framework
- Map linking and describing all relevant institutions, organizations and stakeholders
- Proactive and reactive plans and actions

2. Model structure validation – with participation of the stakeholders

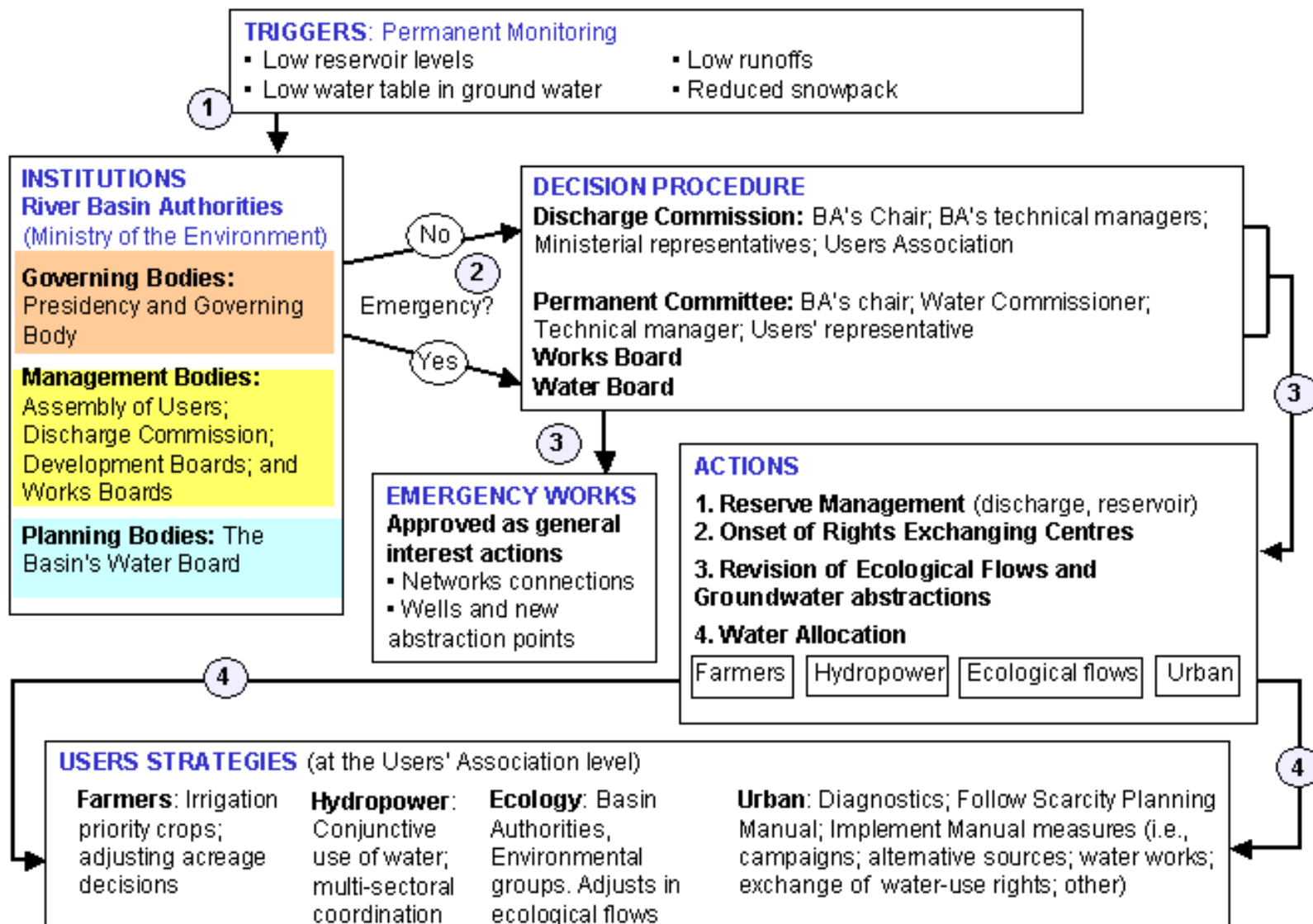
3. Challenges and opportunities for improving current drought management plans

Guide and Roadmap for Mapping Institutions for Meteorological and Agricultural Drought



Example: Spain

Hydrological Drought/Water Scarcity: Reactive Responses



Results of WP1

1. Mapping was presented by all Partners in the Zaragoza Workshop (March 2004)


2. Publication is being reviewed

DROUGHT PREPAREDNESS AND MITIGATION IN THE
MEDITERRANEAN: ANALYSIS OF THE ORGANIZATIONS AND
INSTITUTIONS. A. IGLESIAS and M. MONEO, Eds. Options
Méditerranéennes

3. Synthesis publication will be submitted to an international journal by Sept 2004

WP2: Terms of Reference for Drought Identification, Risk Analysis, and Best Practices

Context, rationale and objectives of the Terms of Reference

- **Deliver clear and precise instructions about the work to be conducted by each consortium's partner** 
- **Be unanimously accepted by all partners**
- **Provide the basis for Deliverable D6 (Workshop No. 2. Finalizing Guidelines for Drought Preparedness Plans) scheduled for 15 Oct (mo 27)**

**WP3:
Workshop**

1. Terms of Reference (Context)

Define methodology to develop the Guidelines for Drought Management in the Mediterranean

2. Definition of the Organizational Unit of application of the TOR

Geographic unit: River Basin or Catchment's System

Risk Management Unit(s): Derived form the analysis of Institutions and Organizations

3. Drought Identification

Methods for assessing water availability in a system

- Indicators of meteorological and hydrological drought
- Characterization of drought periods
- Spatial aggregation
- Data: sources, scales, and reliability

4. Risk Analysis

- Definition of risk: Conceptual definition of risk and compatibility with the working operational concept of the Risk Management Units.
- Identification of the potential impacts of drought in the different sectors/systems based on historical data. Check list and ranking
- Characterization of risk in the different sectors/systems. Identification of the direct consequences of drought (fair inference and attribution). This includes the application of the drought indices to establish risk level (correlations and methodology)
- Vulnerability assessment. Identify underlying causes of risk to increase the adaptive capacity (management) and develop policy decisions to increase adaptation options
- Action identification. Identify options to reduce risk by reducing the underlying causes (vulnerability)
- Integrated risk management

5. Best Practices for Risk Reduction

- Historical drought management actions (as well their success)
- Early Warning Systems
- Example: The 10-Step Planning Process (Wilhite, 1991)

Partner's Studies

- **Country level:**
Application, revision, and evaluation of the TOR for drought management in each partner country
- **Integration:** Evaluation and synthesis at the Mediterranean wide level

Guidelines for Drought Management

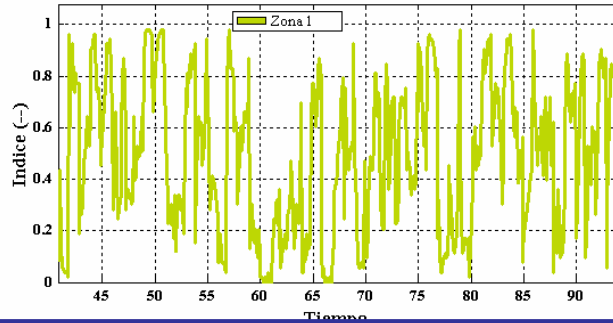
Guidelines for Drought Preparedness Plans in the Mediterranean Region

Examples of Ongoing Work:

Drought Identification, Risk Analysis, and Best Practices

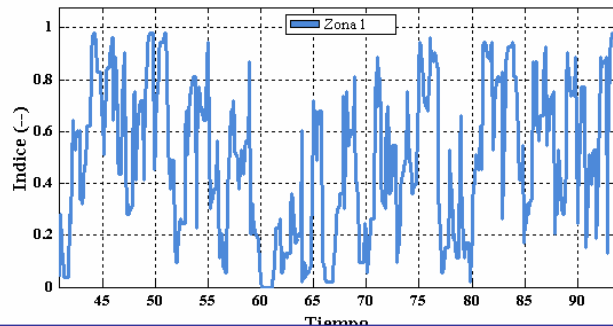
Drought Identification using the SWSI Index (combines precipitation, streamflow and storage)

Precipitation



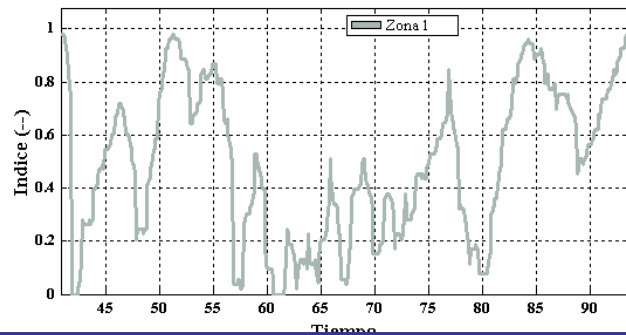
$\times 1/3$

Streamflow



$\times 1/3$

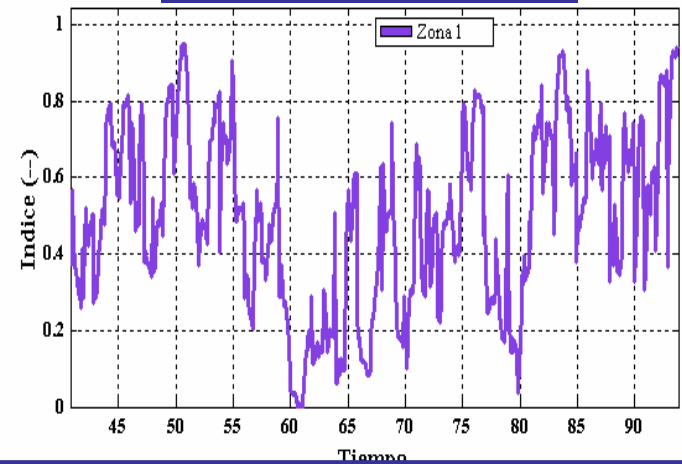
Stored volume



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DROUGHT CRITERION:
SWSI values below 1 for more than six consecutive months

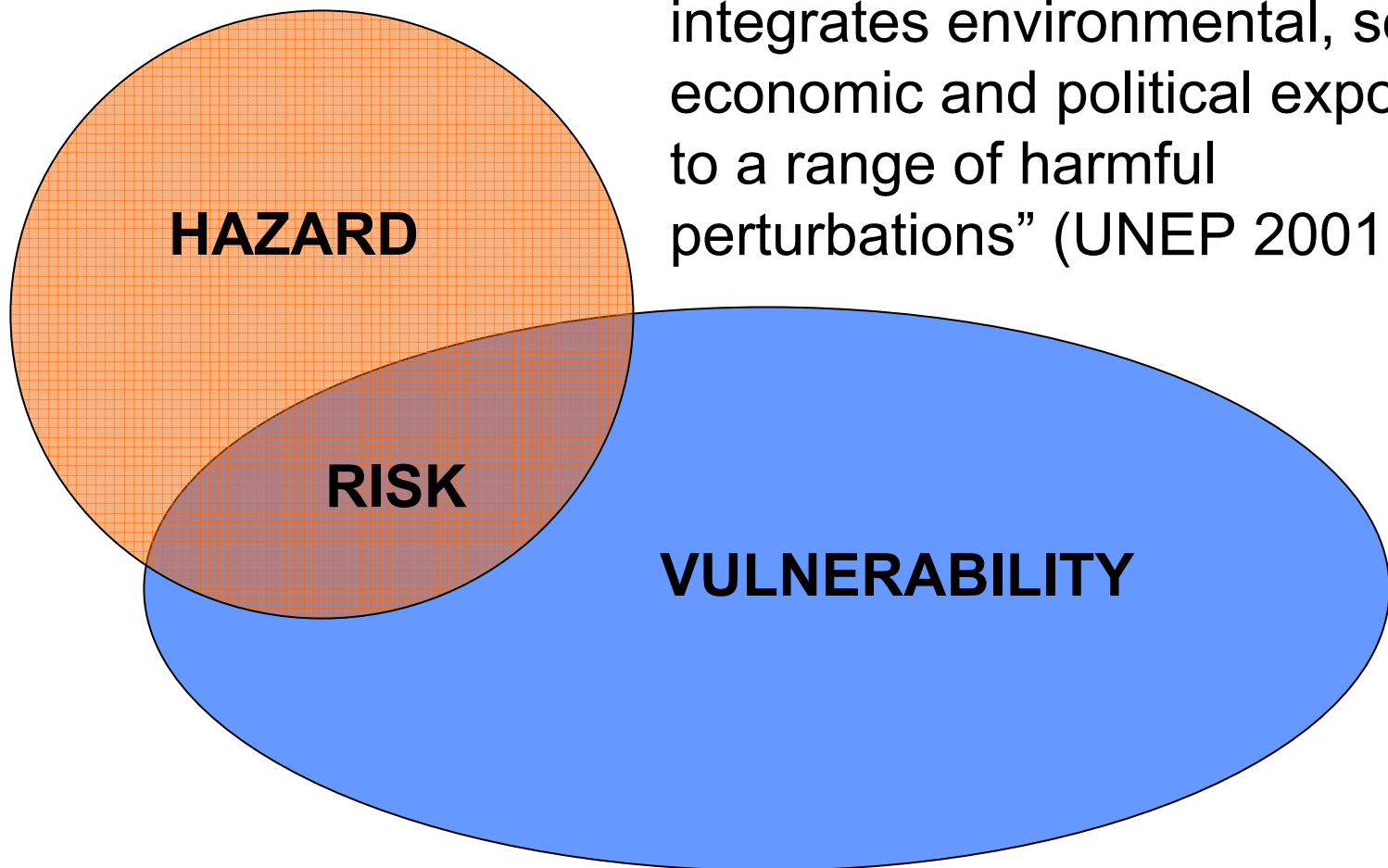
SWS Index



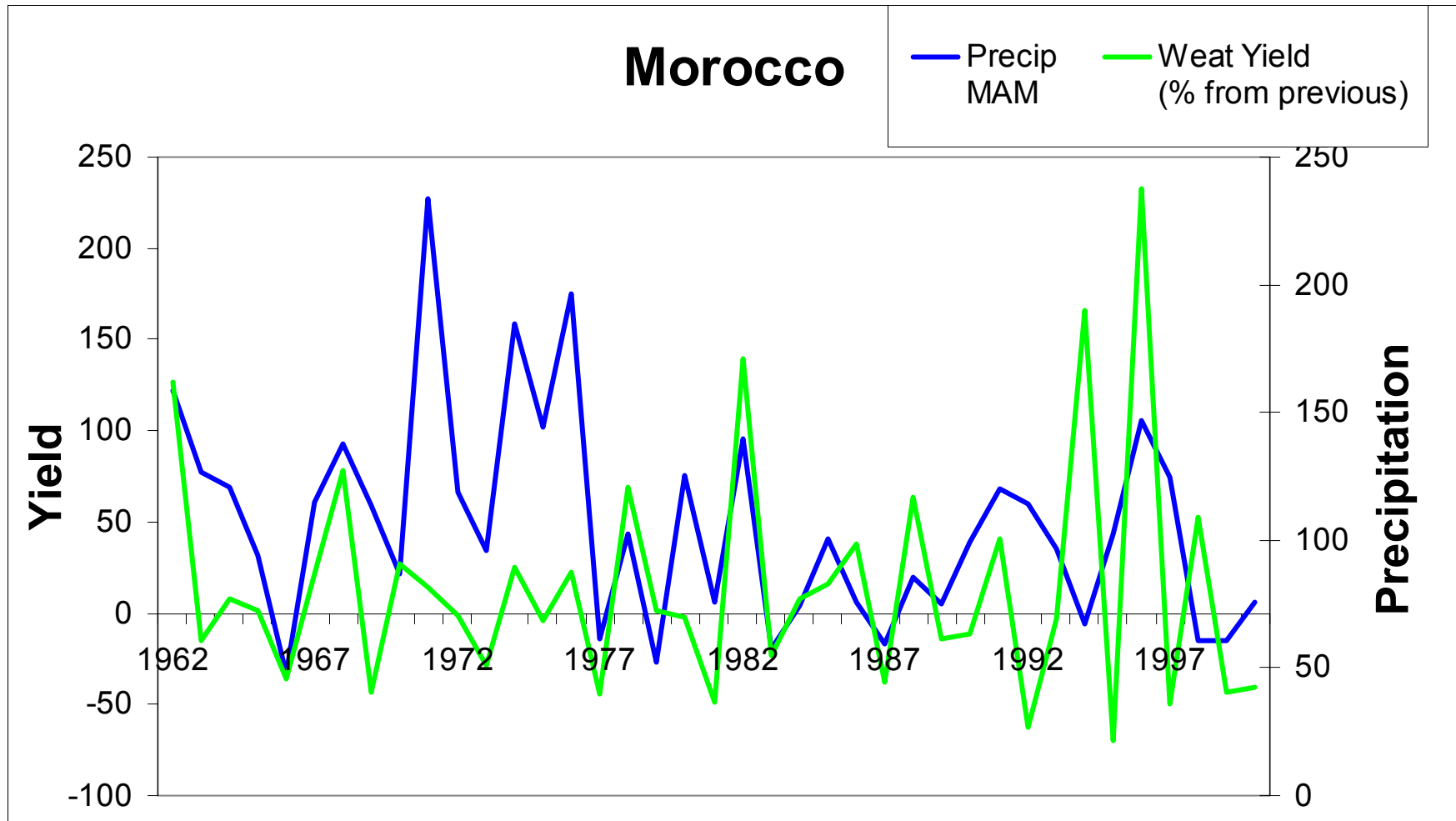
INTENSITY CRITERION:
Droughts reaching SWSI values -2 and -3

Risk Analysis: Integrating MEDROPLAN's methodology into natural hazards and development methodology

“[Vulnerability] is an aggregate measure of human welfare that integrates environmental, social, economic and political exposure to a range of harmful perturbations” (UNEP 2001).

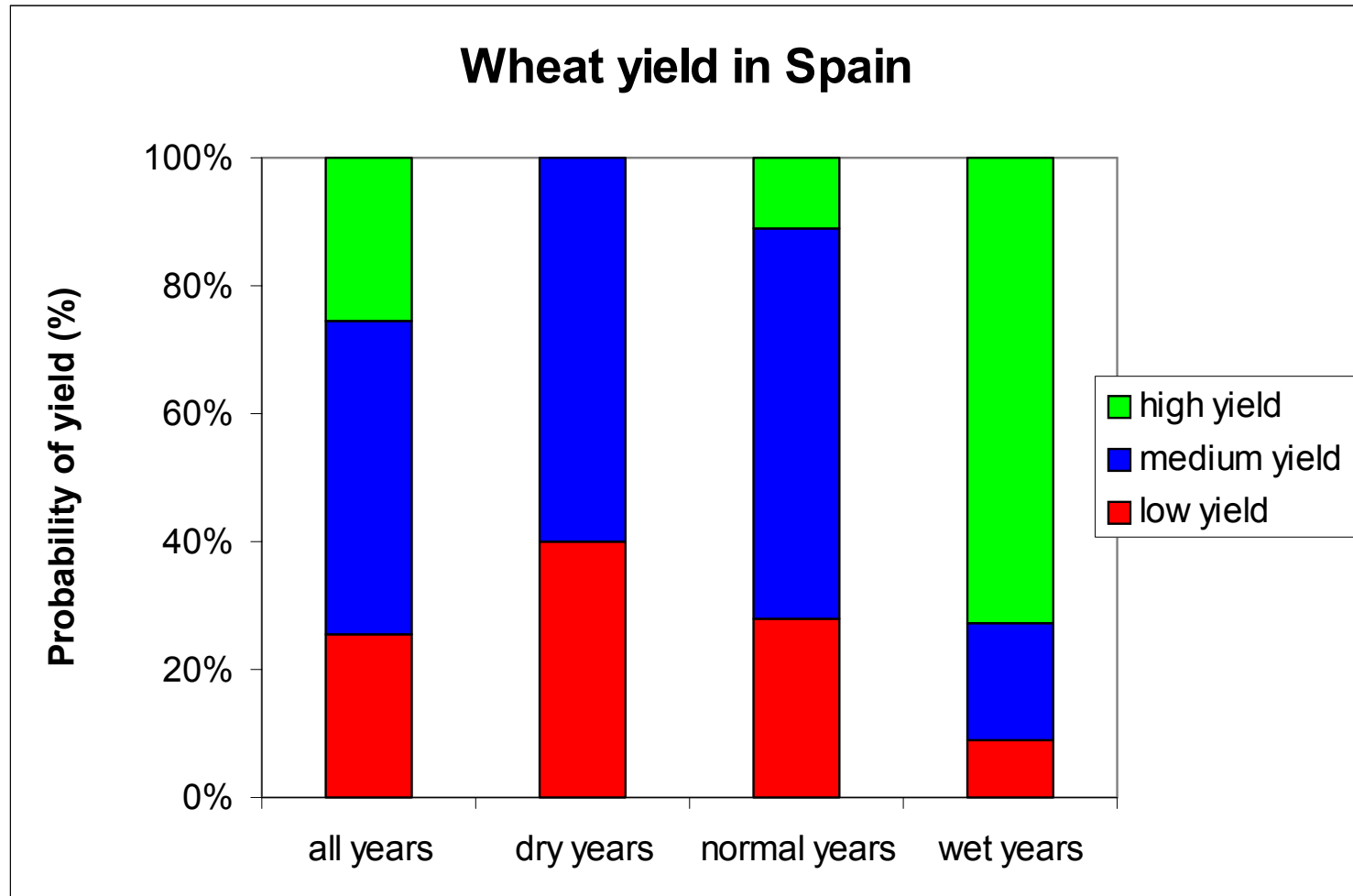


Crop responses to rainfall: Cereals



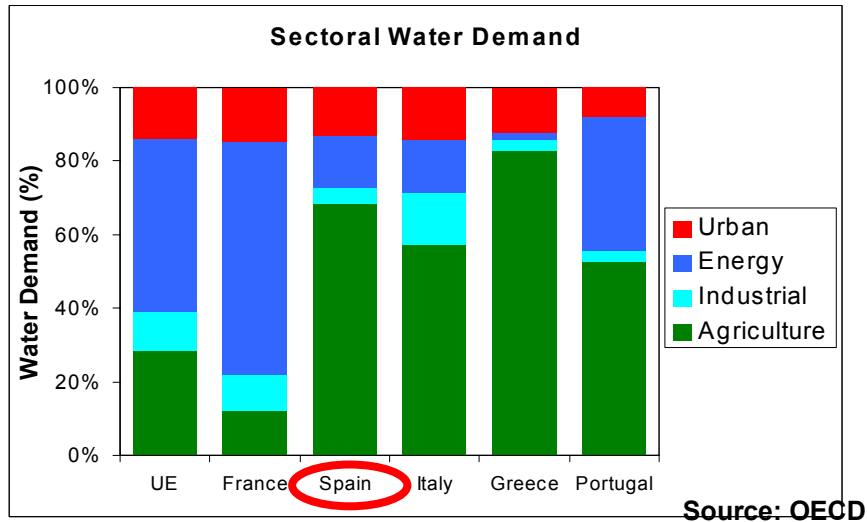
Source: Iglesias and Moneo, 2004

Probability distribution of adequate yield

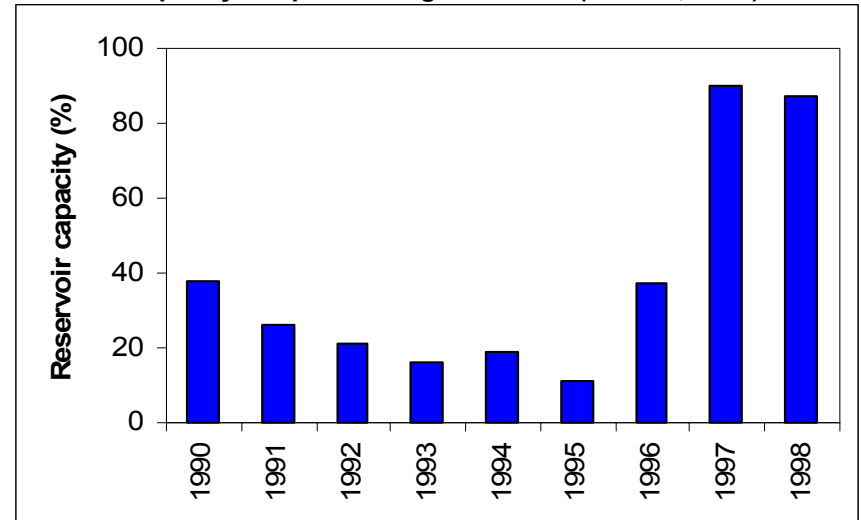


Source: Iglesias and Moneo, 2004

Risk: Competing Users and Management



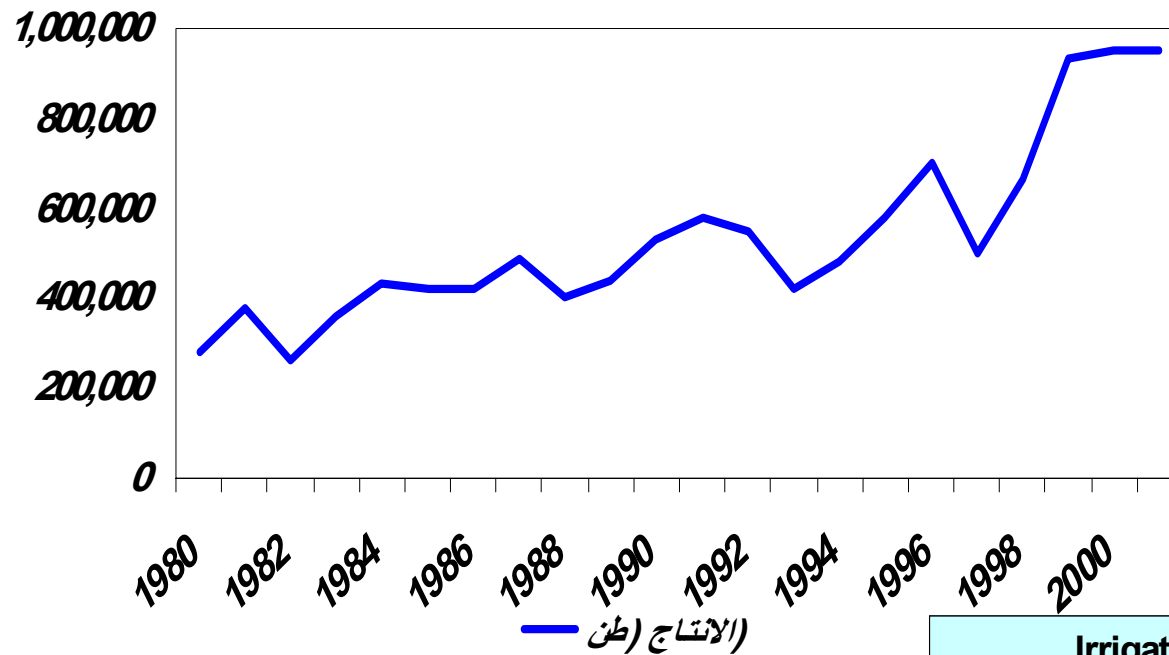
Reservoir capacity in Spain during 1990-1998 (CEDEX, 2001)



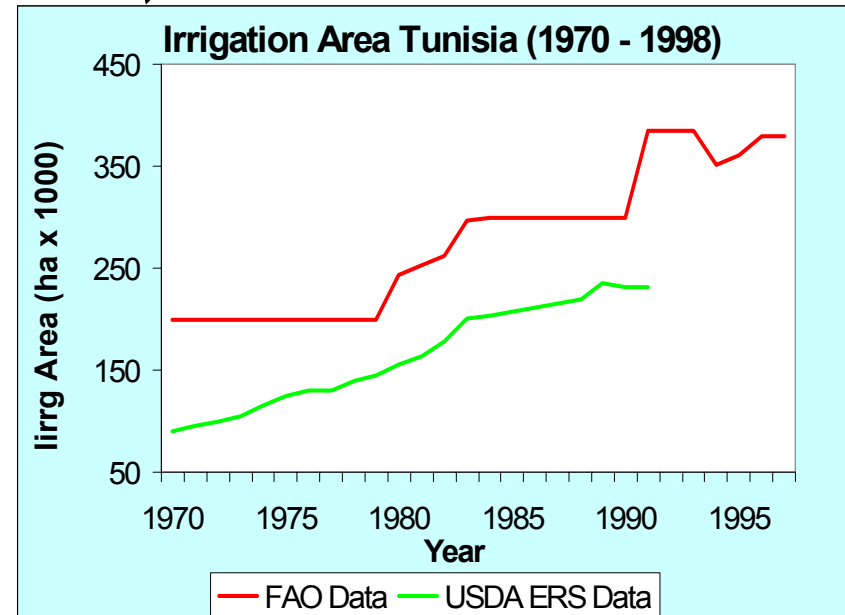
Reducing Risk in Agriculture: Technology and Industry



Data: scales, sources, reliability



Source: R. Mougou, INRGREF





Mediterranean Drought Preparedness and Mitigation Planning (MEDROPLAN)



Europe Aid
Cooperation Office
Euro-Mediterranean
Regional Programme
for Local Water
Management

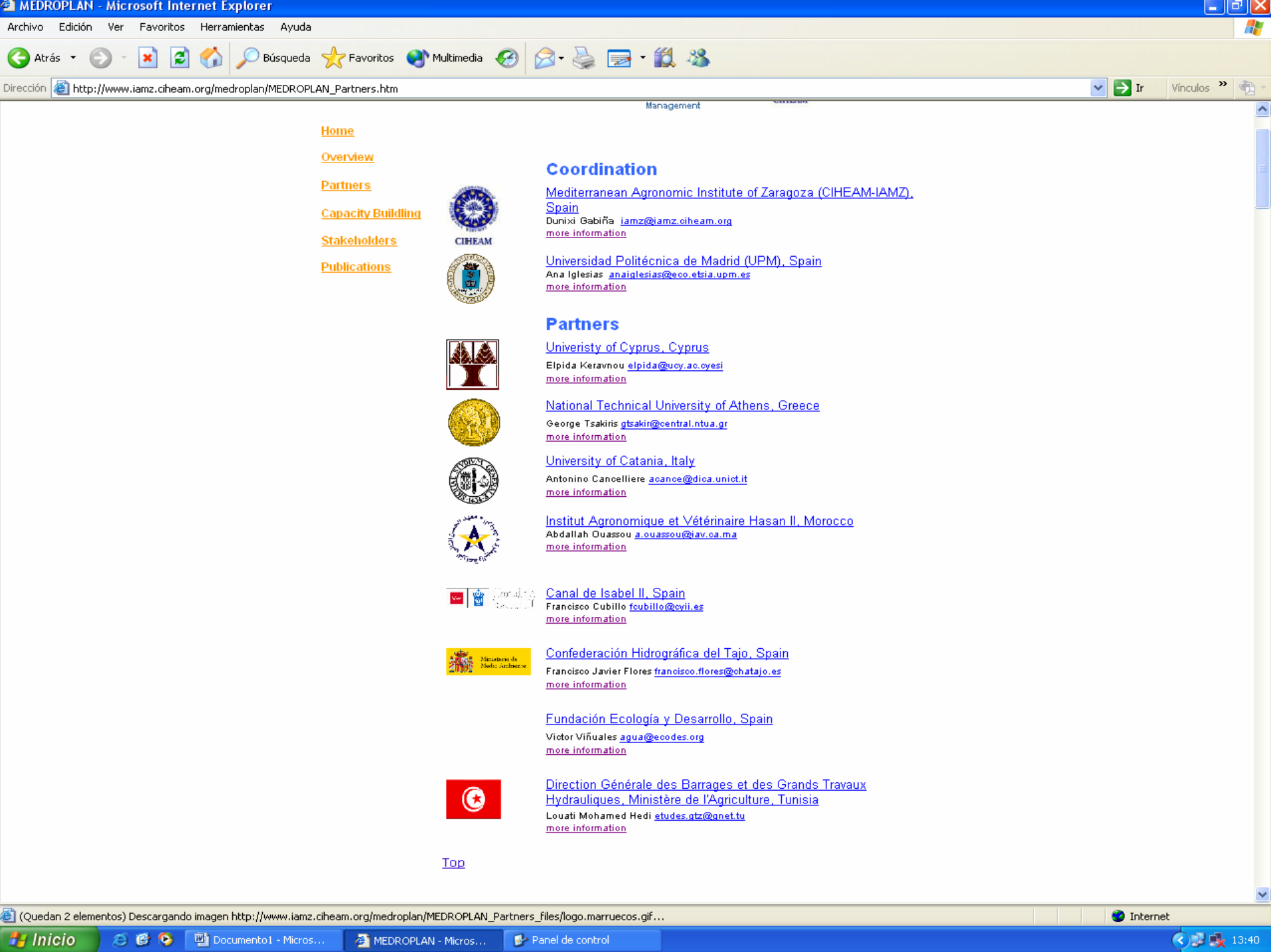


Coordination:
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Agronomic Institute of
Zaragoza (IAMZ)

MEDROPLAN is a Project funded by the European Commission within the framework of the Euro-Mediterranean Regional Programme for Local Water Management

The objectives of MEDROPLAN are to develop Guidelines for drought preparedness plans and to set up a drought preparedness Network for Mediterranean countries.

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PARTICIPANT STAKEHOLDERS IN MEDROPLAN WS1 IN ZARAGOZA (SPAIN) MARCH 2004

STAKEHOLDERS	COUNTRIES
Mediterranean rainfed farmers	SP
Tourism companies	
Industrial companies	
Water Basin Authorities	CY, IT, SP
Local Water Authorities & Water Suppliers	GR, IT, SP
Meteorological and Hydrographic Institutions	BU, CY, IT
Ministries of Agriculture, Environment, Water, Tourism, Industry	CY, IT, MO, SP, TN
Insurance companies	SP
Agricultural banks and rural lending institutions	
Research, Training and Development Institutions	CY, FR, GR, IT, MO, SP, TN
International Cooperation Organizations	SP, SY

58 participants from 9 different countries

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