CIRCLE
Climate Impact Research Coordination for a Larger Europe

Aquimed project

Participatory design of adaptive groundwater management strategies and instruments in Mediterranean coastal water scarce areas as a response to climate change

Two initial ideas

- Work in coastal aquifers in risk/current situation of overexploitation, as areas all the more vulnerable to CC impacts

- Articulate a common research programme with 3 research "threads": participation, foresight and groundwater resource management instruments

Main objective

- To develop methods to support local stakeholders in:
  - 1) undertaking foresight analyses
  - 2) assessing adaptive strategies of management of groundwater resources and uses,

  in order to reach a sustainable use of these resources.

Presentation of the project

- Partners
- Case studies
- The project objectives and their background
- The work packages

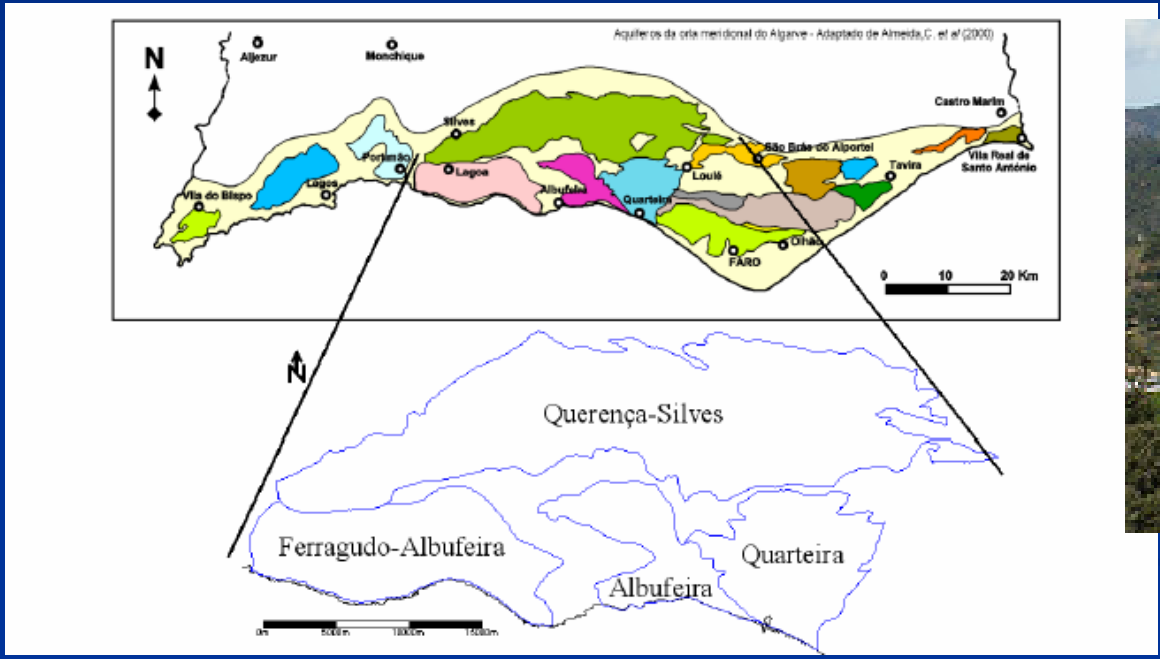
Partners

- Main partners:
  - SOCIUS –Technical University of Lisbon
  - ENA Meknes
  - Brgm
  - G-Eau Water Research Unit (CIRAD, Cemagref)

- Collaboration with local institutions in each study area (catchment management agency, local government, local office of the Ministry of Agriculture)

Study areas: 3 coastal aquifers

The Querença-Silves, Portugal



- karstic aquifer: the main aquifer in the Algarve Region
- Groundwater uses, mainly irrigation
- Risks of overdraft, seawater intrusion and pollution by fertilizers
- Recently created Algarve hydrologic region administration, which will be in charge of setting up groundwater resource management plan

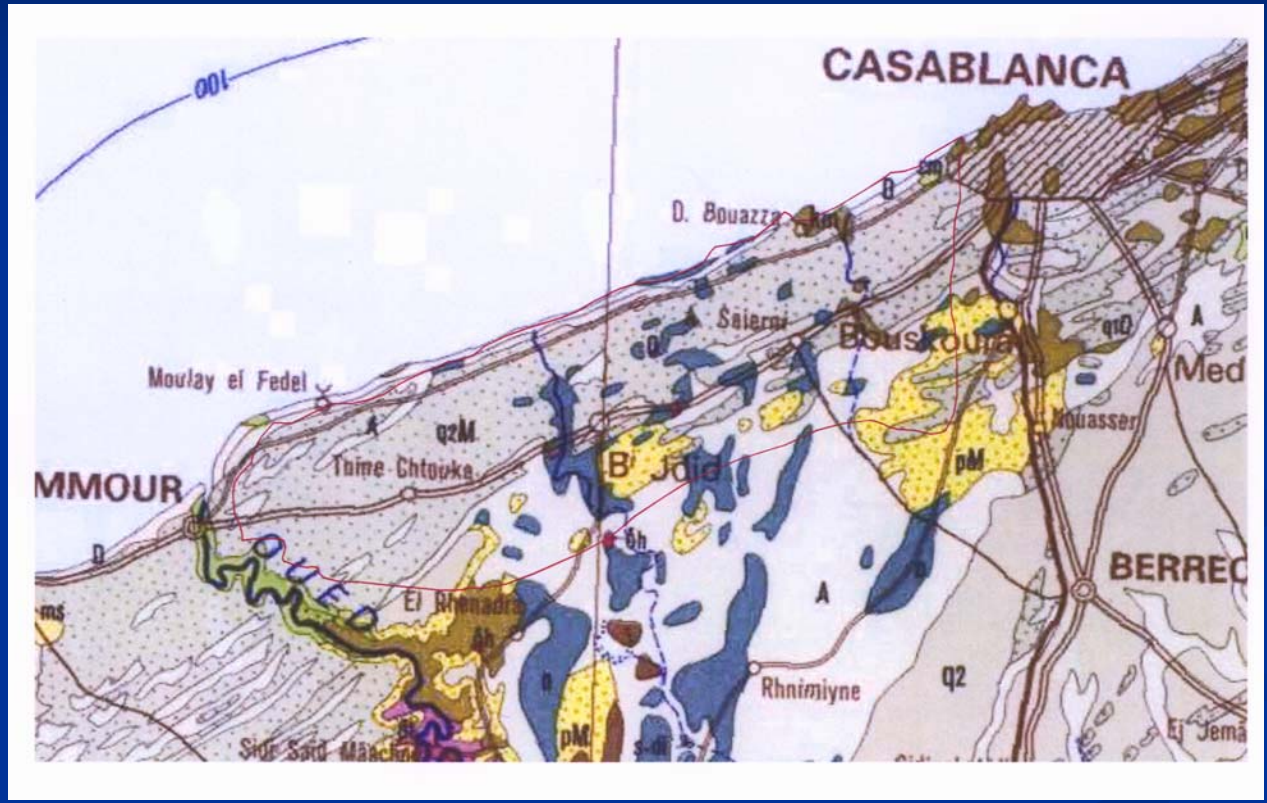
The Roussillon Plain multilayer Aquifer, France

- Two main layers: Quaternary and Pliocene

- Groundwater uses:
  - Irrigation
  - Local government managed drinking water networks
  - Individual wells for lawn irrigation

- A local planning and decision committee (CLE) and planning document (SAGE) in process

The Coastal Chouia Aquifer, Morocco



- Uses: mainly irrigation and some wells for drinking water networks

- Seawater intrusion since the 90s due to drought and groundwater pumping => strong decrease in agricultural activities in the region

- Recently created catchment management agency

4 Specific objectives

- **3 scientific objectives**
  - 1) one on PARTICIPATION issues
  - 2) one on FORESIGHT analysis including CC impacts
  - 3) one on GROUNDWATER RESOURCE MANAGEMENT
- **Knowledge sharing objective**
  - 4) two-way exchange of knowledge and experience between stakeholders and researchers of the three working areas.
- Implementation of these 3 scientific objectives in the 3 case studies, very diverse in terms of :
  - 1) level of stress over resource use;
  - 2) institutional process to manage the resource,
  - 3) data available for management and foresight analyses.

1. PARTICIPATION

- ***General context***: an acknowledged "participation paradigm" of water users in water resource management but
  - Unclear implementation ways
  - Shortcoming of some past participative processes

- ***In the study areas***:
  - Existing opportunities for participation in planning and reflection about management tools

1. PARTICIPATION

- Strong constraints
  - Many unregistered users, Weak user organizations
  - Situation way out of Ostrom principles for long-enduring Common Pool Resource managements (e.g., resource dynamics largely unknown, uneasy identification of resource limits, high control cost of groundwater uses)
  - Unbalanced negotiation capacities among stakeholders
  - Very different perception of the resources, its dynamics, and different "actualization rates"

- ***Scientific objective***: Analysis of stumbling-blocks and opportunities to set up genuine participation of stakeholders in a situation of numerous weakly organized small-scale water users.

2. FORESIGHT

- CC: existence of regional climatic models that may be discussed by stakeholders

- ***Scientific objective***: How to design and evaluate evolution scenarios with stakeholders, that include CC estimated impacts?

- In the study areas, high impact of anthropogenic activities on water resources: how to clarify the interrelation between CC factors and other human related ones (social, economics) in foresight analyses?

2. FORESIGHT

- How to support local stakeholders in reflecting, from their everyday life and current perceptions of CC:
  - on foresight analyses that take into account CC perspectives?
  - from local, individual level and discussion of ***individual adaptation*** to scenarios that include CC prospects, to a discussion of ***possible adaptation and management strategies at resource level?***

- How to use existing knowledge of water resources, uses and CC prospects:
  - In forms that may be understood and manipulated by local stakeholders,
  - In order to support discussions over possible future scenarios and management objectives?

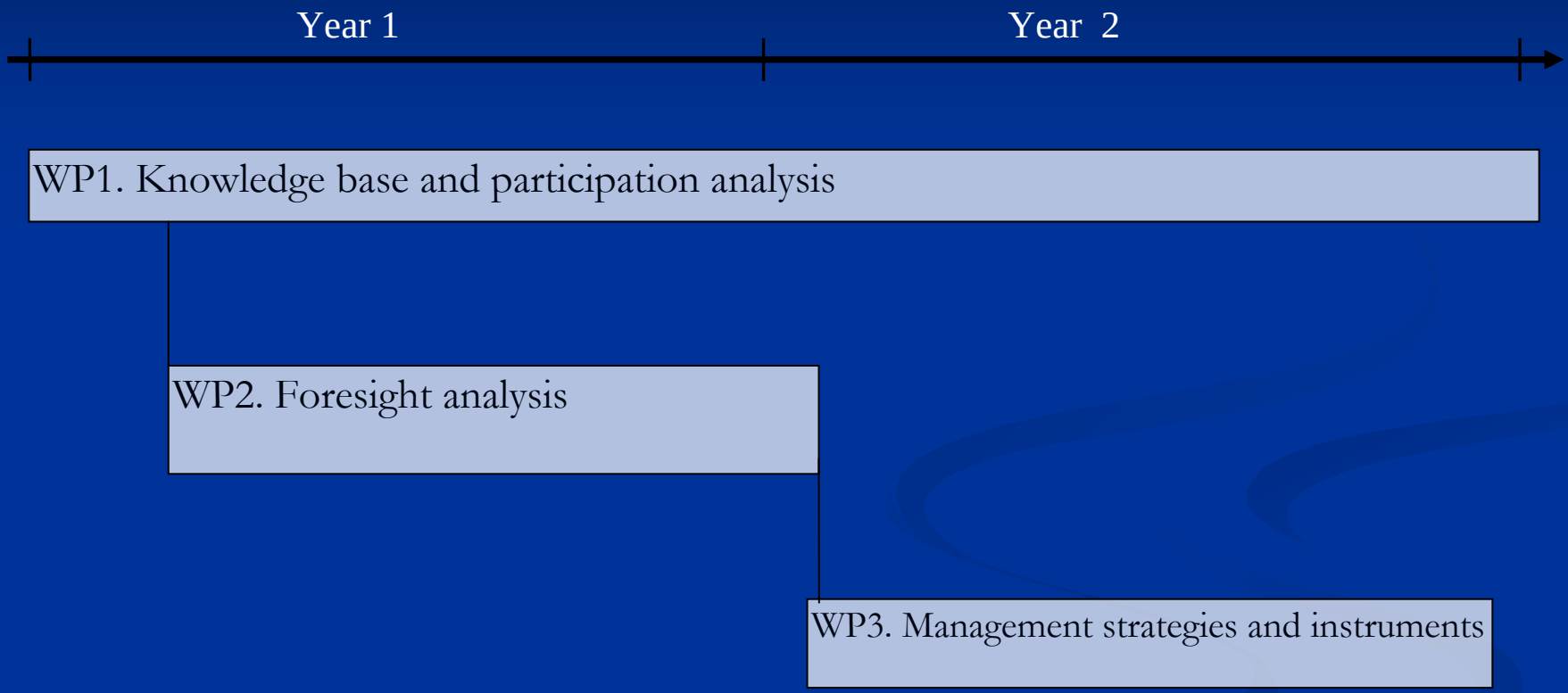
3. GROUNDWATER RESOURCE MANAGEMENT

- Growing stake around the world and more specifically around the Mediterranean
- Some successful management strategies set up in situations of:
  - Only large-scale users (cities, large-scale farmers)
  - Strong water management organizations and institutions, with hign technical and financial capacities
- Much less successful implementation of strategies in the (much more common) situations with
  - Numerous informal/small-scale water users
  - Limited technical and financial capacities
  - The bulk of situations: Tragedy of the Commons
  - No existing blueprint emerging on the international stage
- ***Scientific objective***: The identification and analysis of management strategies and instruments of coastal aquifer resources and uses

- How to accompany stakeholders in the identification, analysis and comparison of possible management strategies and tools based on previous foresight analyses to:
  - Improve adaptation
  - Possibly manage water uses

- In French and Portuguese case studies: strong interactions between surface water and groundwater resources

Main Work Package organization



WP 1: PARTICIPATION

- Knowledge base on the 3 case studies
- Stakeholder analysis
  - Representativity of existing user organizations
  - Analysis of existing participation spaces for water resource planning and management
- Proposition for conception of workshops (foresight analysis and discussion about management strategies and tools)
  - Group composition
  - How to support dialogue (social learning, acknowledgment of the plurality of points of view , objectives and legitimacies)
  - Take into account possible asymmetries in power/information/negotiation capacities
- Monitoring of the workshops

WP 2: FORESIGHT

- Analysis of stakeholder perception of the water resource dynamics and of current CC, and identification of the CC indicators they judge relevant for their activities.
- Construction of future scenarios with stakeholders,– including available information on CC or on socio-economic data at local level
- One way of representing CC: repetition of the occurrence of crisis that has occurred in the past
- Work with homogeneous groups of stakeholders and later mixed groups

WP 3: RESOURCE MANAGEMENT

- Going from an analysis of « adaptation » at user level to a discussion at the resource level

- Workshops to identify, analyze and compare possible instruments to manage the resource

- Kick-off meeting held on Oct 18-20 in France
  - Participation of the representatives of the local catchment management agencies of the 3 study areas

Thank you for your attention