



The AquaStress Work Block 1 – Case Study development and Stakeholder Bodies

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AquaStress Work Block 1

Objectives

- To oversee and coordinate the definition and implementation of the AquaStress Project Case Studies
- To form Stakeholder bodies both at the Project (SH Council) and Test Site (Local Public Stakeholder Fora – LPSF) levels, and to ensure and coordinate their active participation in the Project, both as a driving force and a quality assurance mechanism

Current Status

- Official Project Start Date: 01/02/2005
 - 3rd year of Project implementation
 - Case Study Definition was completed in the 2nd Year and the Case Study content was finalized in the 2nd Annual Meeting (February 2007)
 - Case Study Implementation phase initiated on M18, July 2006

- Meetings Important to the Case Study progress
 - A. Joint Work Team (JWT) initiation meeting, Athens 30-31 March 2006
 - B. JWT joint meeting, Brussels 28 June 2006
 - C. Informal PSG meeting on Case Studies, Athens 14-15 November 2006
 - D. 2nd Annual meeting and JWT workshop, Nafplion 12-15 February 2007

2nd Year Activities

- Formation and operation of the Joint Work Teams (JWTs), consisting of partners/experts from the different WBs in support of the Case Study Definition process
- Final definition of water stress mitigation option activities was undertaken at the Test Sites in the context of Case Studies
- Activities for the formation of the JWTs were initiated in the 1st Joint Assembly, and coordinated by the WB1
- JWT formation took place at the informal PSG Athens meeting (30-31 March 2006)
 - Final members list and JWT Coordinators were set internally
- Joint Work Teams have been active in all Test Sites since April-June 2006, and put forward Case Study Proposals
- Case Study Proposals were reviewed in an informal PSG Meeting (Athens, November 2006)
 - All Case Studies proceed as proposed
 - Preliminary Case Study budgets were fixed accordingly
- Implementation activities are under way (by the JWTs) in all Test Sites
- The Local Stakeholder Fora have been further activated, to ensure their continued involvement and contribution to the Project Activities, and the Test Site local Stakeholders played a major role in the 2nd Joint Assembly

WB1 Test Site and Case Study Deliverables

1. D1.2-2, Data on sectorial analysis and water stress conditions
 2. D1.2-3, Feedback surveys and interviews to WB2 (institutional framework, social issues, and public participation in the Test Sites)
 3. D1.2-4, Feedback surveys and interviews to WB3 (water stress issues and the focal problems in the Test Sites following the DPSIR framework of analysis)
 4. D1.2-5, Feedback surveys and interviews to WB4 (supporting tools to be used in the case study implementation phase)
 5. D1.4-1, Definition of Field Implementation Activities
- Test Site information was collected and compiled on water stress characterization, water availability issues, institutional and administrative issues, social issues, mitigation options and supporting tools

Recent Accomplishments - 2nd Annual Meeting and JWT Workshop

➤ Objectives

1. Definition of a common integration and implementation pathway for the Case Study activities within each region
2. Development of synergies across the regions

➤ Themes

1. Clarification of the content of the defined Case Study activities in each region
2. Partner discussion on the integration of activities of the same type, across the 8 Case Study regions
3. Definition of the Testing and Evaluation plan
4. Set-up of an efficient and effective Cooperation-Coordination and Monitoring framework for the AquaStress Case Studies

➤ Real integration among the different research teams into the common goal of the Case Study

➤ Definition of the goal of each case Study, and the means to achieve this goal, as well as the responsibilities of each partner/JWT member

➤ Clarification of Case Studies progress and plans of activities, for a global view of the Implementation process

➤ Integration of the testing and evaluation activities across regions

The AquaStress Case Study Definition Process

Introduction

- “Case Studies” is a common element in most European Research projects
- Results are usually fragmented and a major issue is their integration into the European policy-making scene
- The Aquastress project is an example where Case Studies were defined during the project life after a systematic and well defined research process

AquaStress Case Studies

➤ Definition

- “An in-depth plan covering selected issues and possibly selected regions within the Test-Site, by implementing specific options or combination of options in all or part of a Test Site, and offering integrated solutions coupling technical, economic, institutional, educational and social assets”

➤ Case Studies aim

- to serve as learning platforms to understand responses and impacts of different types and conditions of water stress and
- to refine the guidelines for water stress mitigation

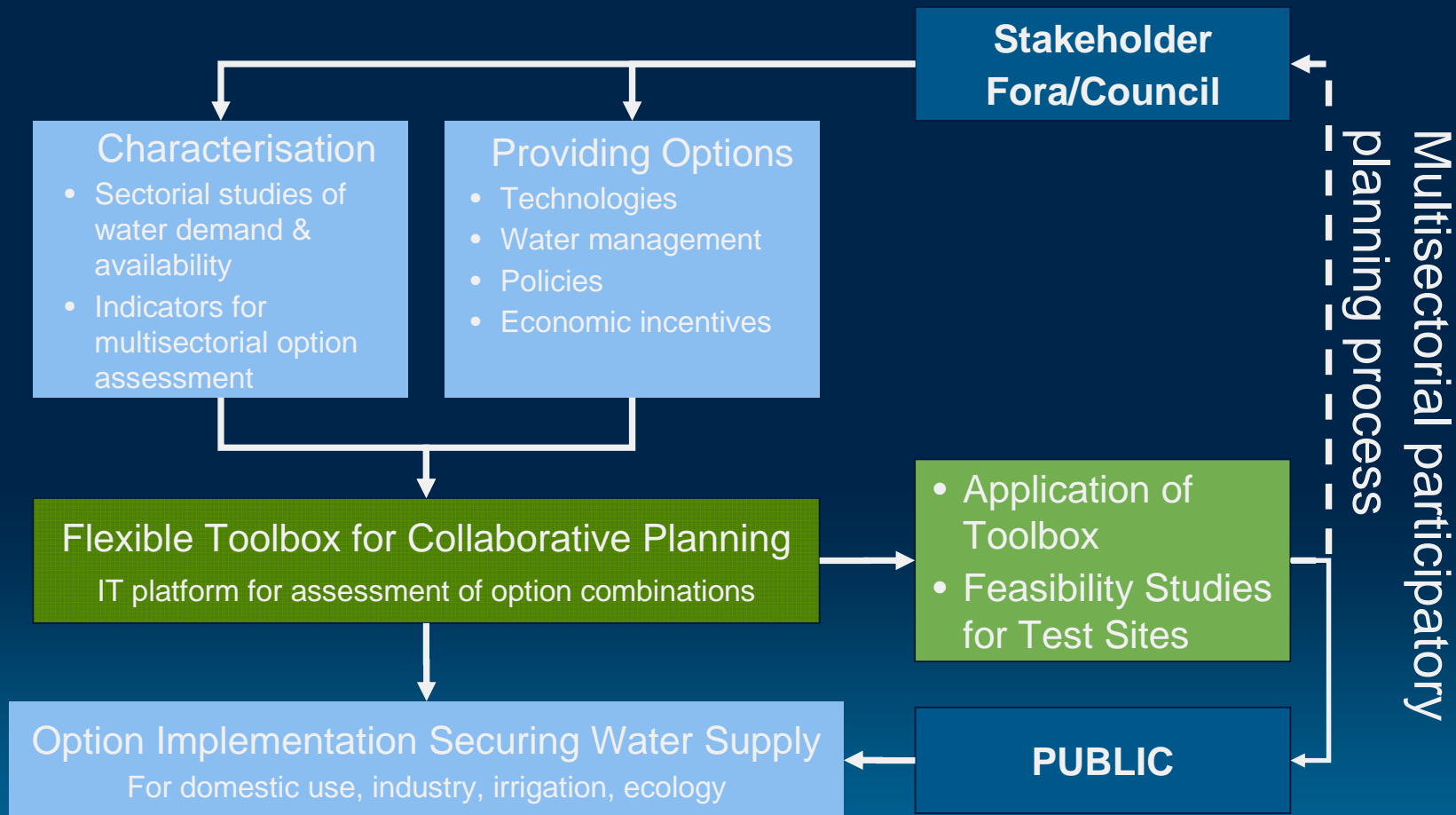
➤ Types of Case Studies

- External Case studies (Experiences from actual implementations or experiments in the past to serve as input to the knowledge base on [cost-effectiveness of] measures)
- Virtual implementation
- Field implementation

Overall Objectives

- Identify and implement Case Studies to address the water stress related **Focal Problems** in 8 sites
- Build up **cost-effective solutions** and **broadly supported decisions** for sustainable water management on:
 - Technical options, policy mechanisms, economic tools, administrative reforms
- Full involvement and participation of Local Stakeholders in the definition and implementation process

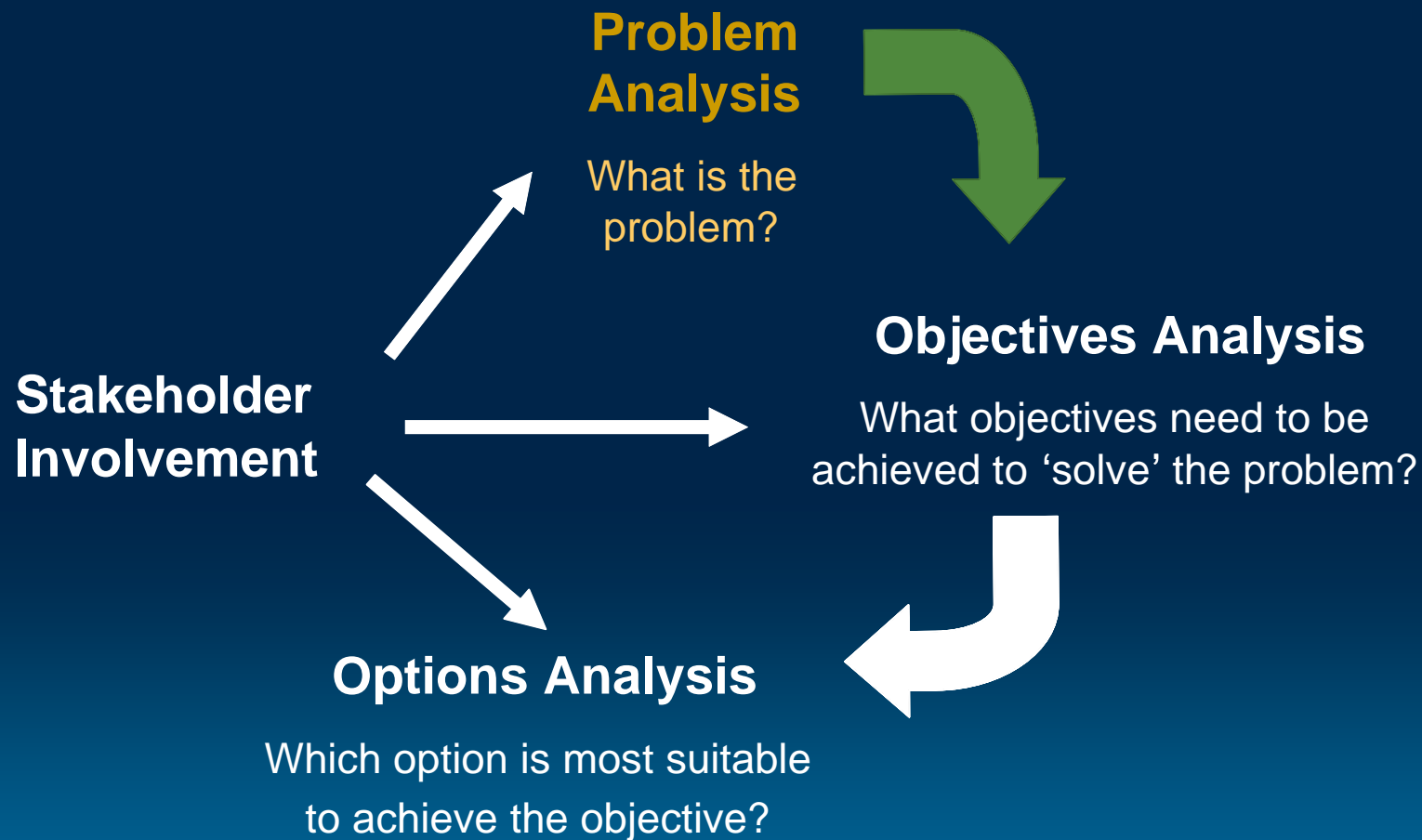
The AquaStress approach



Case Study Progress and Milestones

1. Definition of overall Case Study objectives – Sectors, Sustainability criteria and European policies
2. Selection of Options
 - Definition of assessment indicators
 - Evaluation of Options or Combination of options
 - Option ranking according to SH preferences
3. Implementation and Assessment of Options
 - Determining the extent or size of the application of options
 - Training local stakeholders on using tools, assessment of options and evaluating Case Study outcomes
 - Implementation by project partners and stakeholders
 - Assessment of Option impacts and synergies

Definition and Selection



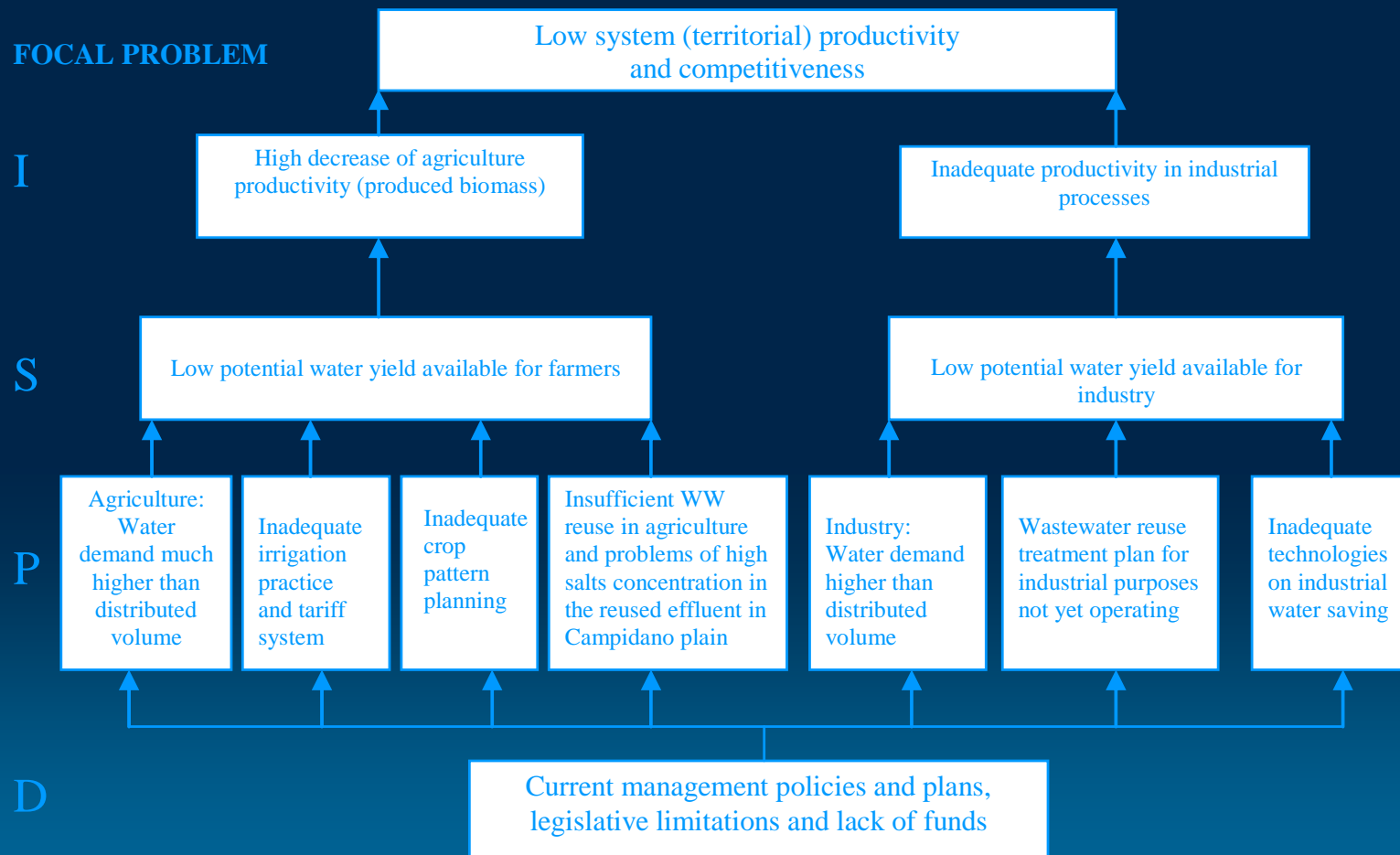
Case Study Definition process – 3 main stages

- Stage 1: focal problem analysis, offer and demand identification
- Stage 2: offer and demand reconciliation, and definition of Case Study activities
- Stage 3: refinement and integration of activities

Stage 1

- Focal problem analysis, offer and demand identification (completed in the 1st year of the Project)
 - Identification of WB3 Partners areas of interest and expertise in order to develop Case Study activities accordingly – Project level ([offer](#))
 - Stakeholder consultations to identify the existing focal problems using DPSIR approach, and areas for mitigation interventions - Test Site Local level ([demand](#))

Stage 1 example: a Focal Problem identified in Flumendosa (one of 4)



Stage 2

- Offer and demand reconciliation, and definition of Case Study activities
 - Completed in July 2006
 - Joint Work Teams were formed in all Test Sites for the definition of activities
 - JWT WB3 participants selected to provide the appropriate expertise
 - Selection was based on each site's specific water stress characteristics
 - Further Stakeholder consultations and discussions were held for the formulation of a list of activities
 - A final list of (separate) activities was defined for each Case Study

Stage 2 example: definition of the Flumendosa Case Study activities

Integrated and sustainable water management in the Flumendosa-Campidano Test Site					
Activity	Sustainable crop growth in the Campidano/ Fluminimannu basin: Determination of irrigation requirements to ensure sustainable agriculture	Research activities related to improvement of agricultural practices to decrease pollutants losses	Flow rates and dam operation during dry periods	Activities related to economic aspects	Training and Capacity building activities Awareness, dissemination and communication activities
Sub activities	Work plan formulation CRIWAR further development Data collection Model runs / Field testing activities Implementation of improved irrigation scenarios	Discussion with stakeholders on water quality goals Data collection / management Group session with local farmers pilot group SWAT model environmental database setup Model Calibration / validation "Perceptual model" development Reporting and discussion with stakeholders Group session for perceptual model validation and discussion "Hot spots" identification Selection of BMPs for simulation Discuss viable BMPs with stakeholders Definition of procedures for motivation towards BMP adoption	Literature review Investigation of suitable operation patterns Investigation of effects of different possible operation schemes to related sectors Identification of most suitable operation plans	Economic analysis	Workshops courses, dissemination events
Partners	HYC, ALTERRA	HYC, CNR-IRSA, CRANFIELD	UHANN, HYC	UoP, UoR, HYC	CIHEAM-IAMB, HYD, HYC

Stage 3 - Refinement and integration of activities

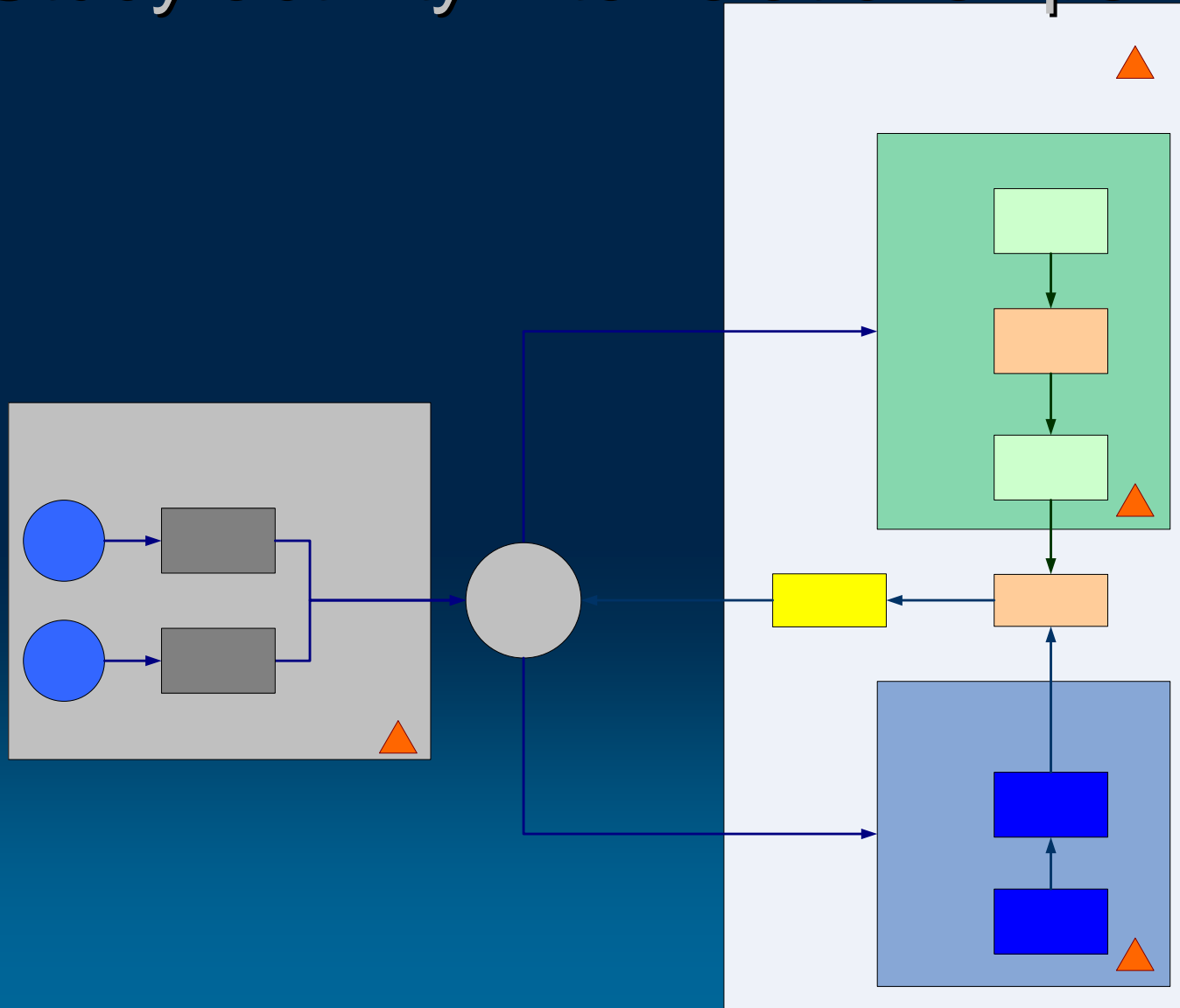
- Further refinement of defined activities, and specific Goals and means to achieve these formulated on the basis of regional characteristics
 - Means reflect the already established Case Study activities
 - Goals were generalized to achieve independence from the specific local context and greater applicability of the outcomes
 - First step towards Case Study integration: a common target was established for all of the activities to be undertaken at each Site
- Up to this point, Case Study activities were disjointed - Integration of activities became urgent and necessary
 - Well-defined interrelationships, enabling further integration across Case Studies and the elaboration of general guidelines based on the Case Study outcomes
- Current effort, initiated in February 07, to integrate all elements within each Case Study, while facilitating the integration across Case Studies
- For Case Study integration, a plan for activities aiming for a common goal is not sufficient; need to determine
 - Responsibilities
 - Activity planning in relation to each other
 - Required inputs and outputs produced among activities
 - Exploitation potential of outputs for reaching the desired goal
- A flowchart-like depiction of the Case Study process enables the visualization of these interrelationships, inputs/outputs, and feedback processes
- Two main axes of reference applicable to all Case Studies:
 - The selection and investigation of distinct supply side and demand side mitigation options
 - The continuing consultation with the local Stakeholders aiming at determining the research approach and building consensus on the issues at hand
 - Diagrams are being developed along these two axes, elaborating on the target of each mitigation option, its inputs from and its outputs to other activities, while also showcasing the overall analysis frameworks of the Case Studies and their overall goals

Stage 3a example: Goal and Means for its achievement for the Flumendosa Case Study

Case Study Goal	Integrated water resources management ensuring a sustainable agriculture
Means to achieve the goal	<ol style="list-style-type: none">1. Water use efficiency and water productivity in agriculture2. Improvement of management of agricultural practice to decrease the discharge of pollutants3. Optimisation of dam operation as to Minimum Vital Flow in low Flumendosa basin

Stage 3b example: Flumendosa Case

Study activity interrelationships



Where to?

From Local Case Studies to European policy making

- Identify commonalities and differences in the test sites (and related local case studies)
- Identify the critical water issues relevant to the application of existing EU environmental management policies
- Integrate local critical issues into a regional vision
 - Generalize problems, ways of solutions, and future challenges
 - Ensure coherence with the specific social, cultural, economic settings of the sites/regions
- Determine the role that the implementation of local case studies can play in developing legislative instruments/initiatives/action plans for mitigating water stress problems at the EU level
- Assess the added value brought by the issues/problems at the local case studies to a general cultural change in water management

Annex

AquaStress Case Studies Definition Summary

Case Study Goals, Means and
Activities

Cyprus

➤ Goal

- Decrease of groundwater overexploitation

➤ Means

- Rationalization of the applied irrigation practices
- Promote the use of reclaimed water



Cyprus Case Study Activities

Means	Decrease of GW overexploitation by rationalizing irrigation practices	Promote the use of reclaimed water
Activities	<ol style="list-style-type: none"> 1. Ground water use <ol style="list-style-type: none"> a. Analysis of Limassol GW basin b. Analysis of irrigation requirements c. Analysis of alternative water uses d. Economic dimension analysis 2. Capacity building <ol style="list-style-type: none"> a. Increase awareness b. Training c. Dissemination 	<ol style="list-style-type: none"> 1. Reclaimed water use <ol style="list-style-type: none"> a. Reclaimed water quality assessment b. Analysis and promotion of GW replenishment by artificial recharge c. Social dimension analysis d. Economic dimension analysis of water reuse 2. Capacity building <ol style="list-style-type: none"> a. Increase awareness b. Training c. Dissemination d. Public participation

Flumendosa, Sardinia, Italy

➤ Goal

- Integrated water resources management ensuring a sustainable agriculture

➤ Means

- Water use efficiency and water productivity in agriculture
- Improvement of management of agricultural practice to decrease the discharge of pollutants
- Optimisation of dam operation as to Minimum Vital Flow in lower river basin



Flumendosa Case Study

Activities

Means	Sustainable crop growth in the Mannu river basin (Campidano irrigated area): determination of irrigation requirements to ensure sustainable agriculture	Improvement of agricultural practices to decrease pollutants losses
Activities	<ol style="list-style-type: none"> 1. Application of CRIWAR model in the test area 2. Field testing activities 3. Implementation of improved irrigation scenarios 	<ol style="list-style-type: none"> 1. Application of SWAT model in the test area 2. Field testing activities 3. Identification of "Hot spots" sources of pollutants 4. Selection of BMPs for simulation 5. Discuss viable BMPs with SH 6. Definition of procedures for motivation towards BMP adoption
	<ol style="list-style-type: none"> 1. Economic analysis to estimate farmer's willingness to pay (WTP) for sustainable water management in agriculture 2. Estimate the impact of water pricing on the socio-economic viability of agricultural water management options 	

Flumendosa Case Study

Activities

Means	Optimisation of dam operation as to Minimum Vital Flow in low Flumendosa basin	Awareness, dissemination and communication activities
Activities	<ol style="list-style-type: none"> 1. Investigation of suitable operation patterns 2. Identification of most suitable operation plans to ensure the integration of Minimum Vital Flow with other needs/users 3. Training course on Minimum Vital Flow in Temporary rivers 4. Workshop on Minimal vital flow: discussion of issues with stakeholders and end-users (industry-agriculture/domestic/...) 	<ol style="list-style-type: none"> 1. Summer school (held in Cagliari in May 2006) - 150 students involved 2. Participation to "The ecological island" (held in Cagliari Trade Fair 24-25 November 2006) through "laboratories" for students - more than 150 participants involved 3. Training and dissemination activities to be defined

Guadiana, Portugal

➤ Goal

- To contribute to the sustainable development of a southern European region with a relevant E.U. investment in irrigation agriculture by improving water use & allocation of water resources in the agricultural & urban sectors

➤ Means

1. Rationalization and optimization of water resources use
2. Application of technical options and best practices for sustainable agriculture



Guadiana Case Study Activities

Means	Rationalization and optimization of water resources use	Technical options application and best practices for agriculture sustainability
Activities	<ol style="list-style-type: none"> 1. Case study region characterization 2. Water quantity/quality evaluation and estimation <ol style="list-style-type: none"> a. Surface water b. GW c. Surface water control – Optimization of reservoir operation rules 3. Economic evaluation 4. Water reuse as an alternative option <ol style="list-style-type: none"> a. Evaluation of scenarios for wastewater reuse implementation b. Assessment of sanitary risk water reuse c. Implementation of training programmes 5. DSS application 6. Capacity building <ol style="list-style-type: none"> a. Outcomes for dissemination b. SH involvement c. T&D and complementary activities 	<ol style="list-style-type: none"> 1. Agriculture water use: assessment and optimization of best practices 2. Irrigation water management/ tailoring cropping patterns <ol style="list-style-type: none"> a. Agricultural water demand b. Performance indicators 3. Capacity building <ol style="list-style-type: none"> a. LPSF: T&D & complementary activities b. Meetings, Workshops c. Training & Dissemination activities

Iskar, Bulgaria

➤ Goal

- **Sharing water under conditions of scarcity and stress**

➤ Means

1. Industrial water management - reducing demand and pollution (Kremikovzi test site)
2. Municipal water demand management (Sofia water supply system as a test site)
3. Water stress (flood & drought) management through participatory process



Iskar Case Study Options

Means	Industrial water management	Municipal Demand Management	Water stress (flood & drought) management through participatory process
Activities	<ol style="list-style-type: none"> 1. Modelling the industrial water system <ol style="list-style-type: none"> a. Water balance at an industrial site b. Investigation of system components c. Recommendation and evaluation of potential reduction measures for priority and hazardous priority compounds 	<ol style="list-style-type: none"> 1. Construct Influence Diagrams (IDs) of WDM decision processes through expert consultation 2. Use IDs to construct decision support tool (DSS) 3. Populate DSS using results from 600 household questionnaires 4. Evaluation of DSS through WDM strategy design workshop. 	<ol style="list-style-type: none"> 1. First stage design & mutual education 2. Final clarification of all activities 3. Interviews with citizens 4. Participatory modeling workshops 5. Design strategies & scenarios 6. Strategies multicriteria assessment 7. Final evaluation & planning strategies

Przemsza, Poland

➤ Goal

- Adaptation of water management to meet the need of industrial transformation

➤ Means

- Support modernization of the local water supply systems, presently based on “clean” mine waters, in view of the foreseen closure of mines
- Improve the effectiveness of industrial wastewater treatment
- Equip local authorities with legal and administrative capacity to go through conflicts around protection of unique ecosystems in areas of mining activities
- Strengthening of public understanding of water stress and building a capacity for the integrated water management



Przemsza Case Study Activities

Means	Support to modernization of the local water supply systems which at present are based on "clean" mine waters in view of the foreseen closure of mines	Improvement of effectiveness of industrial wastewater treatment
Activities	<ol style="list-style-type: none"> 1. Identification of alternatives 2. Proposal of evaluation criteria and SH consultation, evaluation of alternatives 3. Formation of pay-off matrix 4. Application of MCA and selection of the best variant 5. Exercise MCDM tools with stakeholders 	<ol style="list-style-type: none"> 1. Industrial water balancing 2. Remote sensing for land use and biggest water users 3. Identification of industrial hot spots 4. Water and contaminant balances of "Szczakowa" tannery 5. "Szczakowa" system components investigation 6. Priority hazardous compounds use study, and suggestion of use reduction measures 7. Industrial water system modelling and tool calibration 8. Model based assessment of industrial water saving option impacts (cost-effectiveness) 9. LPSF feed-back on activities for public perception assessment 10. Action plan definition

Przemsza Case Study Activities

Means	<p>Equip local authorities with legal and administrative capacity to go through conflicts around protection of unique ecosystems in areas of mining activities</p>	<p>Strengthening of public understanding of water stress and building a capacity for the integrated water management</p>
Activities	<ol style="list-style-type: none"> 1. Non-market valuation study 2. Cost-Benefit Analysis on the basis of non-market valuation study results 3. Definition of instruments, on the basis of the CBA, for a sustainable compromise between land reclamation and preservation of natural resources 	<ol style="list-style-type: none"> 1. Development of a collaborative understanding of water stress issues 2. Short courses for decision makers and stakeholder groups covering capacity-building, empowerment, and education 3. Strengthen collaboration with the association "chance for Biala Przemsza" and other local groups 4. Public awareness-raising campaign and development of dissemination material

Tadla, Morocco

➤ Goal

- Integrated and sustainable surface water and groundwater use in intensively irrigated areas

➤ Means

1. Collective projects for irrigation water saving
2. Sustainable crop growth and groundwater control to ensure sustainable agriculture
3. Irrigation performance assessment
4. Integrated management of groundwater and surface water



Tadla Case Study Activities

Means	Collective Irrigation Projects	Sustainable crop growth and groundwater control to ensure sustainable agriculture
Activities	<ol style="list-style-type: none"> 1. Farmer group identification 2. Elaborating the progress report on the farms holding descriptions and the farmers' perception 3. Identification of modernisation projects with farmers 4. Role playing games testing to facilitate dialogue, and evaluation of results 5. Co-elaboration of the project with SH and its financing montage 6. Call for tender support activities 7. Implementation of projects by farmers and water managers 8. Identification of the legal framework of the collective systems and for the creation of a specific management structure 9. Follow up and evaluation of project activates 10. Approach transfer & realisation of movies for expression of stakeholder views 11. Support for scenario definition 12. Ex post project evaluation 	<ol style="list-style-type: none"> 1. Work plan development 2. CRIWAR model further development 3. Data collection 4. Model runs 5. Improved scenarios formulation

Tadla Case Study Activities

Means	Irrigation performance assessment	Integrated management of groundwater and surface water
Activities	<ol style="list-style-type: none"> 1. Work plan development with SH 2. Tool requirements definition with SH 3. Data collection 4. Data processing 5. Performance assessment tool development and implementation 	<ol style="list-style-type: none"> 1. Better groundwater Management for surface water scarcity mitigation <ol style="list-style-type: none"> 1. Diagnosis of current state 2. Studies to fill knowledge gaps 3. Implementation of numerical model in transient conditions, management scenario simulation 4. Analysis of monitoring network functionality 5. Farmer survey on groundwater exploitation 6. Development and testing of DSS system for conjunctive use 7. DSS Implementation 2. Agent-based model of irrigation system <ol style="list-style-type: none"> 1. Conceptual system model 2. Qualitative interviews 3. Quantitative farmer survey 4. Development of behavioural, institutional, biophysical model elements 5. Validation of model and scenario development in interviews/workshops 6. Workshops for discussing model results and evaluation 3. Integration of Models <ol style="list-style-type: none"> 1. Requirement and situation analysis through SH interviews 2. Definition of interfaces and coupling of activities through coordination with research groups 3. Result: Methodological protocol for integration of activities and tool design proposals

Merguellil valley, Tunisia

- Goal
 - Improve water use efficiency in intensively irrigated areas
- Means
 1. Assessing the GW flow yield by Remote sensing and Spatial modelling techniques
 2. Assessing Irrigation System Performance in relation with GW yield
 3. Assessing different schemes of land use pattern and management
 4. Efficient water pricing and institutional settings
 5. Fostering the integration of women in agricultural water management



Merguelil Valley Case Study

Activities

Means	Remote sensing and Spatial modelling techniques in assessing the GW flow yield	Irrigation Systems Performance and relation with GW yield improvement from local to catchment scale
Activities	<ol style="list-style-type: none"> 1. Collection of inventory of irrigated crops by the use of remote sensing techniques 2. Analysis of data 3. Synthesis and analysis of operating data of the deep tablecloths starting from the directories of the exploitation 4. Confirmation of results on basis of sampling 5. Reporting and scientific publication 	<ol style="list-style-type: none"> 1. Data collection and survey 2. Conceptualisation of infrastructure performance 3. Meeting with local SH 4. Modelling and simulation of best system performance accounting improved/adequate agronomique and socioeconomic practices 5. Results discussion with SH 6. Recommendations for improved practices 7. Development and simulation of different "performance" and "water saving" scenarios 8. Provision of inputs for GW balance carried out by IRD

Merguelil Valley Case Study

Activities

Means	Improving the availability of high quality water at catchment scale by assessing different schemes of land use pattern and management	Efficient water pricing schemes and institutional settings	Methods for fostering the integration of women in agricultural water management
Activities	<ol style="list-style-type: none"> 1. Discussion with SH on quality goals 2. Data collection / management 3. Setup SWAT model environmental database 4. Model calibration / validation 5. "Perceptual model" development 6. Identification of pollution "hot spots" 7. BMP selection for simulation 8. Discuss viable BMPs with SH 9. Definition of procedures for motivation towards BMP adoption 	<ol style="list-style-type: none"> 1. Water pricing survey (farmers) 2. Pricing schemes discussion & evaluation in stakeholders forum 	<ol style="list-style-type: none"> 1. Information collection from LPSF 2. Consultation with LPSF

Vecht, The Netherlands

➤ Goal

- Improve water management of the Velt en Vecht Water Board

➤ Means

- Through a participatory approach to determine the optimal ground- and surface water regime, and
- Through a water system analysis to determine the robustness of the water management system



Vecht Case Study Options

Means	Water Systems Analysis	Participatory approach in optimal ground - and surface water regime (GGOR)
Activities	<ol style="list-style-type: none">1. Preparation of a hydrological model2. <ol style="list-style-type: none">a. Application of this model in the service area to determine robustness of water systemb. Application of this model in GGOR3. Final evaluation	<ol style="list-style-type: none">1. Definition of the project plan2. Interactive determination of GGOR3. Final evaluation for Aquastress4. Dissemination and training