



TWINBASIN MISSIONS : REPORTING GUIDELINES

Mission reference
2005 C2 T9 M1

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Mission Report

Wording of mission	<p>The <i>Segura-Crete</i> project focuses on specific areas of interest, based on Integrated Water Resources Management (IWRM), that have been identified as:</p> <ul style="list-style-type: none"> • Implementation of the Water Framework Directive (WFD): the CIS, works developed, Article 5 requirements. • Draught and flood prevention: plans and programmes • Groundwater (exploitation and protection) • Automated Telemetric Network monitoring groundwater parameters • Monitoring networks • Administrative framework (organisation of the River basin authority) <p>There are specific goals and numerous of expectations associated to the <i>Segura-Crete</i> project. Overall, from the twinning between the basin organisations, much is expected to be gained regarding the operation of the other's organization, as well as the exchange of practices and knowledge on IWRM that will help improve their work. Based on the TWINBASIN^{xn} project, it is expected that BOs will:</p> <ul style="list-style-type: none"> • Promote a friendly cooperation between water managers. • Strengthen ties among basin organisations.
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	<ul style="list-style-type: none"> • Improve contact between the basin management organizations participating in the twinning project. • Encourage the exchange of expertise, knowledge and technical personnel. • Improve the effectiveness of integrated water management within organisations. • Improve the overall functional operation of these institutions.
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1. CONTEXT

Place, location	MINISTERIO DE MEDIO AMBIENTE CONFEDERACION HIDROGRAFICA DEL SEGURA Segura Planning Office Segura River Authority Plaza Fontes nº1 30001Murcia, SPAIN
Mission duration	<i>14-19 November 2005</i>

2. OBJECTIVES

	Initial objectives	Results	Results indicator
1	Exchange information for the Implementation of the Water Framework Directive 2000\60\EK (WFD): -the GIS , -works developed, in Article 5,6,7	Concept, methodology, and adaptation of WFD for Integrated Water Resources Management (IWRM) in Segura River basin (SRB): -GIS developed according to the WFD requirements - Article 5 <ul style="list-style-type: none"> • Characterization of SRB • Impact of human activities • Economical analysis of water use • Identification of pressures and the establishment of reference conditions for 	Possible application of the structure of GIS in Crete River Basin (CRB) Due to similar conditions (climatic, environmental, water uses, water scarcity, etc) between the two basins, the developed methodologies in SRB for the adaptation of WFD could be applicable for the CRB and for other river basins of Greece.

	Surface water exploitation and protection.	Surface water in SRB	<p>-Identification and classification of Hydrological units. -Risk assessment of ground water bodies (qualitative and quantitative) -Monitoring system</p> <p>In addition, the implementation of a strategy on reserving ground water supplies in order to deal with emergency situation (droughtwells) will be useful for CRB</p> <p>The implementation of WFD in the management of surface water is also considered to be of great importance for CRB, in particular: -Identification and classification (ecotypes) of surface water bodies. -Specification of the criteria adopted for the characterization. -Risk assessment for surface water bodies (qualitative and quantitative) -Monitoring system</p> <p>Parts of water quality control systems of SRB could be applied or tapped by regional and local administration institutes and water supply organizations in Crete</p>
4	Automated Telemetric Network monitoring.	<p>S.A.I.H (System Automatic Information Hydrological)</p> <p>A Powerful Decision Support tool for:</p> <ul style="list-style-type: none"> - Flood mitigation - Water resources management 	<p>Cretan's representatives manifest interest mostly on the usage of such a system for water resources management and less for controlling the floods. The operational part of the SAIH will be examined in detail for</p>

			possible integration in the existing telemetric system of CRB.
5	Administrative framework (organisation of the River basin authority)	Segura River Administration (SRA) Water Resources Direction	Due to harmonization of the Hellenic National legislation system to WFD, the Directorate of Water at Regional level is now organised in CRB. The organic structure of the SRA, successfully dealing with the implementation of an IWRM at regional level and therefore the SPB's structure will be evaluated for any possible implementation in Crete. The Hellenic Ministry of Environment, qualified for the adaptation of the national legislation system to WFD, will be notified about the projects issues and results.

3. ACTIVITIES DEVELOPED DURING THE MISSION

Activity 1	Topic : <i>Institutional Framework</i>
Description	The exchange of expertise and the acquaintance with the administrative framework of SRB, are the main outcomes of our recent visit at the facilities of the CONFIGERACION HIDROGRAFICA LA SEGURA – SEGURA RIVER BASIN CONFEDERATION. We had the chance to visit the individual directorates and observe how they function.

Activity 2	Topic : <i>Water Resources Management of Segura River Basin</i>
Description	Presentation of water Demand- Supply balance of SRB. -Water resources: Physical characteristics, climatology, meteorological conditions, hydrology, hydrogeology. -Infrastructure: Main Hydraulic systems, conveyance system of Tago

	<p>river- Segura river, dams, wells, desalination plants, water treatment plants.</p> <p>- Conjunctive use of surface water and ground water.</p> <p>-Water uses: land use, consumption per use (domestic, agriculture, industrial, tourist), reuse of treated water, modernization of agricultural practice</p> <p>Water Balance: presentation and analysis of related problems</p> <p>Hydrological National Plan (problems to be addressing)</p>
Activity 3	Topic :Infrastructure of Segura River Basin
Description	<p>a) Visit the Ojos’ reservoir and dam, the inter basin transfer channels and pumping station:</p> <p>-Technical visit at the Ojos’ reservoir and presentation of its functional systems.</p> <p>b) Visit a Desalination Plant.</p> <p>-Technical visit at the San Pedro del Penatar desalination plant. Presentation of the operation of the plant and discussion with the experts about the cost analysis of desalinated water, and the impacts to the environment.</p> <p>c) Visit at a Waste – water treatment plant</p> <p>-Technical visit at the Mar Menor-Sur waste – water treatment plant. Presentation of the plant’s operation and discussion with the experts about the cost analysis and the reuse of water.</p>
Activity 4	Topic : Ground Water in Segura River Basin
Description	<p>Visit the area of Synclinal of Calasparra aquifer</p> <p>-Technical survey at the area of the Synclinal of Calasparra aquifer. The geology, hydrogeology, as well as the water balance of the aquifer were discussed with the Geologist. We also had the chance to visit a “drought well” and a karstik spring in the Segura river basin.</p> <p>-Presentation and characterization, according to WFD, of the main aquifers of the Segura River Basin.</p>
Activity 5	Topic : Agriculture practice

Description	<p>Visit a green house in the Campo de Cartagena</p> <p>-Technical visit at a green house in “Campo de Cartagena” cultivating hydroponic crops. Discussion with the owner about the applied agricultural patterns, and the consumption of water to irrigate hydroponic crops.</p>
Activity 6	Topic : <i>System Tools for Water Resources</i>
Description	<p>-SSD - AQUATOOL</p> <p>Demonstration of SSD – AQUATOO,L which is a nodal supporting decision system (software), concerning the planning and management of water resources. Discussion on the capabilities of the tool and the new developments for adapting the WFD.</p> <p>- GIS</p> <p>Demonstration of the Geographic Information System applied by the Segura River Basin Confederation.</p>
Activity 7	Topic :<i>Implementation of Water Framework Directive</i>
Description	<p>Presentation of the progress done by the Segura River Basin Confederation in incorporating the requirements of the 5th , 6th and 7th articles in SRB:</p> <ul style="list-style-type: none"> - Basin characterization - Pressures and impacts - Protected areas - Economical analysis - GIS
Activity 8	Topic :<i>Water Quality Management of Segura River Basin</i>
Description	<p>Presentation of the qualitative and quantitative monitoring networks, applied in surface and ground water.</p> <ul style="list-style-type: none"> - -ICA net - stations COAS - stations COCA - automatic alert stations

4. LESSONS LEARNT during the mission *(what could be shared with other partners and/or introduced in guidelines, as far as IWRM is concerned)*

- **About Methodology:**

As the river basin analysis in Region of Crete is still in progress, the developed methodologies in SRB, according to WFD requirements (economical analysis of water; the characterization of river basin; the impact of human activities; the identification of pressures - establishment of reference condition for surface water bodies; the registration of protected areas and the application of GIS), can be used as a pattern for Region of Crete.

- **About Practice:**

The Directorate of Water in Region of Crete is now being organized; the detailed organic structure of the Segura River Basin Confederation has much to offer on that field.

The technical visit at the desalination plant, moreover the economical analysis and the related environmental issues discussed, present a useful tool for a future application in Crete.

5. DISSEMINATION (opportunities and difficulties). In what measure these learnt lessons are applicable to:

a) The Basin Organization the expert belongs to:

The learnt lessons are applicable in the Region of Crete (Authority) especially at the directorates of: Water Resources Management, Public Earthwork, Civil Protection, Technical Service of Municipalities, Regional Plan and Design. The dissemination of information could be performed through the site of Region of Crete (www.region-crete.gr), as well as directly by e-mailing information to people involved in relevant issues.

b) National IWRM practice:

The learnt lessons are applicable to the Ministry of Environment, Direction of Water. The dissemination of information could be done through the electronic site of the Ministry of Environment (www.minenv.gr), as well as directly by contacting persons in relevant Sections of the Ministries, authorized to evaluate a project out coming.

c) Regional experiences:

The learnt lessons and obtained information are applicable to the International Network of basin Organizations. In particular the Mediterranean Network of Basin Organization and the related to the implementation of the WFD the EURO – INBO group. The information could disseminate by Internet through the site of INBO (www.Inbo.org).

d) Worldwide:

The learnt lessons as well as the obtained information are applicable to the International Network of basin Organizations. Particularly, the Mediterranean Network of Basin Organization and the related to the implementation of the WFD the EURO – INBO group. Internet could disseminate the information, through the site of INBO (www.inbo.org).

Furthermore, the specific web site that has been designed for the TWINBASIN project (www.twinbasin.org), could facilitate the exchange of information on best water resources management practices of River Basin Organization.

The learnt lessons and obtained information are also applicable to the **Arid** project which is dealt with water resources use and management in arid and semi-arid regions (<http://arid.chemeng.ntua.gr/Project/>). The Arid project includes three research projects on integrated and sustainable Water Resources Management: a) **WaterStrategyMan** (Developing Strategies for Regulating and Managing Water Resources and Demand in Water Deficient Regions); b) **Medis** (Towards Sustainable Water Use on Mediterranean Islands: Addressing Conflicting Demands and Varying Hydrological, Social and Economic Conditions); c) **Aquadapt** (Strategic Tools to Support Adaptive, Integrated Water Resource Management under Changing Utilisation Conditions at Catchment Level: A Coevolutionary Approach).

6. IDENTIFIED TIPS

⇒ *Identified tips which could be useful for colleagues*

The mission is characterized as a successful one achieving its goals, and some of the reasons contributed to that are summarised below:

- An agreement on the agenda before the mission
- Experts should present the related to the agenda topics
- Power point presentations
- Demonstration of software (eg DSS), telemetric system, GIS, etc
- In site visit and discussion with the involved persons
- Preparation of a dossier including all relevant information, articles, maps etc.

7. PERSONAL COMMENTS

⇒ *What does the missionary think about his mission*

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The mission was very interesting and well organized. It should be mentioned that over 30 people were involved in the different activities developed. The people involved are experts in a specific field concerning the management of water resources. Furthermore, the hospitality and the warmth of all Spanish people managed to turn a business trip to a wonderful experience for all participants.

Visitations to historical – archaeological interesting sites (Cartagena, Salzillo museum), focused also on ancient hydraulics systems and contributed to a better understanding of the development of the area.

The common, Mediterranean characteristics between the TWINBASIN Segura and Crete partners, regarding climate, hydrology, hydrogeology, water deficiency, water uses, even agricultural patterns and the related water issues, strengthens the need

for the development of a common methodology for Integrate Water Resources Management in Mediterranean areas.

We find it very useful and support the idea of organizing a final conference of all involved TWINBASIN missions.

8. CONTACTS

➔ *principal local contacts met*

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Bibliography			
Name	Description / Notice	Reference	
Nuria Peña Lorezo	Consultor	nplorenzo@mu.intecsa_inarsa.es	968/225006
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9. BIBLIOGRAPHY

➤ *Main documents, manuals or supports used during the mission which could be useful for colleagues*

Bibliography	
Name	Description / Notice
Decision support system for water resources planning and management	Hydrologic basin plans in Spain
J. Andreu, J.Capilla, E.Sanchis	AQUATOOL, a generalized decision-support system for water-resources planning and operational management
Confederacion hidrografica del Segura	Water wheels past and present in the market garden of Murchia
Confederacion hidrografica del Segura	Report of articles 5 and 6 of the WFD, November 18th, 2005
Confederacion hidrografica del Segura	Development of the joint use program of surface water and groundwater for the optimization of the hydraulic resources of the Segura river basin, report 16th November, 2005
Confederacion hidrografica del Segura	Ministerio de obras publicas y urbanismo, Direccion General de Obras Hidraulicas
Confederacion hidrografica del Segura	Administracion Hidraulica Espanola, Noviembre 2005
Confederacion hidrografica del Segura	Visit to the Segura river basin Twin Basin project Creta – Segura, report
Confederacion hidrografica del Segura	Water quality management, report November 2005
Confederacion hidrografica del Segura	Geografic information systems (GIS) in the Segura water planning office, report
Confederacion hidrografica del Segura	Maps, Water Plan of Segura river basin.
Confederacion hidrografica del Segura	Groundwater resources, report, November 2005
Confederacion hidrografica del Segura	Tajo – Segura Transfer, Master Plan
Confederacion hidrografica del Segura	Groundwater resources, November 2005
Confederacion hidrografica del Segura	Hydraulic administration of Spain, report

Confederacion hidrografica del Segura	Segura river basin confederation, report
Confederacion hidrografica del Segura	Water resources direction, flow chart, report
Confederacion hidrografica del Segura	Water quality management, report

Websites	
Name	Reference
Segura River Hydrologic Plan	http://www.mma.es/cuencas/segura/docum_plan.htm
WFD Art 5,6,7 report	http://www.mma.es/cuencas/segura/directiva_marco.htm

N.B. This framework provides necessary information for further capitalisation and dissemination, but should not prevent experts from making any other comments (as far as basins characterisation is concerned, for instance).