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# **Preparatory Action on development of prevention activities to halt desertification in Europe**

## **Desertification 2012-2013**

**Report No 1**

**(1<sup>st</sup> Quarterly report)**

**(01/01/2014- 30/04/2014)**

## **PROTAGUS**

### **PILOT PROJECT ON WATER BALANCES IN THE TAGUS RIVER BASIN**





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## 1. General Information

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- Name of beneficiary of grant agreement: **EVREN, S.A.**
- Official legal form: **Evaluación de Recursos Naturales, S.A.**
- Official registration No: **A-46449112**
- Official address: **Conde Altea 1, 46005 Valencia**
- Name and title of the Project Coordinator: **Ana Nieto, Administrator**
- Name of partners in the pilot initiative:
  1. **Confederación Hidrográfica del Tajo (Tagus River Basin Authority). Miguel Antolín**
  2. **Agência Portuguesa do Ambiente (Portuguese Agency of the Environment – APAMBIENTE-). Manuela Matos**
- Name of observers to the pilot initiative:
  3. **United Nations Office to Support the International Decade for Action “Water for life” 2005-2015**
  4. **Sub-Directorate on Planning and Sustainable Use of Water (Spanish Ministry of Agriculture, Food and Environment)**
  5. **Júcar River Basin Authority**
- Title of the pilot initiative: **Pilot Project on Water Balances in the Tagus River Basin (PROTAGUS)**
- Grant agreement number: **07.0329/2013/671306/SUB/ENV.C.1**
- Start date and end date of the *reporting period*: 01/01/2014- 30/04/2014
- Target countries: **Tagus International River Basin, Spain and Portugal.**

## 2. Activities undertaken and problems encountered

This chapter provides an overview of activities carried out in the reporting period, including a brief description and an assessment of their status. The activities correspond those listed in the application and hence in the grant agreement. Furthermore, problems encountered or foreseen that have or will impact each activity (and maybe a related deliverable) are listed in this chapter, along with the proposed solution. It consists of two tables, namely Table 1 and Table 2 as presented below.

*Table 1. Status of the planned Activities, period: 01/01/2014- 30/04/2014, PROTAGUS*

Title	Brief description of activity undertaken within the reporting period	Partners/Stakeholders involved	Status <sup>1</sup> (C, P, NS)
Task 1) Establishment of the context and background	a. Identification of main water related issues in the Tagus River Basin. b. Assessment of desertification/water scarcity aspects. c. Summary of climate change scenarios and previsions. d. Assessment of specific measures in the Draft River Basin Management Plan and water economic aspects, taking into account also the possible preliminary works of 2015 RBMPs.	EVREN Tagus RBA APAMBIENTE	P
Task 2) Data gathering process	a. Assessment of available data for the basin (Spanish and Portuguese side). b. Identification of data gaps. c. Establishment of approach for determining scales (selection of management scale, criteria for data available at different scales). d. Fill-in of gaps through Aquatool and other models/tools.	EVREN Tagus RBA APAMBIENTE	P <sup>2</sup>
Task 3) Build-up of water accounts	a. Improvement of database. b. Share of knowledge on water balances and SEEAW with CHT and Portuguese officials. c. Development/completion of tables. d. Reinforce and develop previous experience: share results with the Júcar River Basin Authority (where these actions have already been implemented), transmit possible improvements for their tables, exchange of ideas to improve exercise. e. Assessment of socio-economic	EVREN Tagus RBA APAMBIENTE	NS

<sup>1</sup> C=Completed, P=In Progress, NS=not started (for results already achieved reference may be made to previous reports).

<sup>2</sup> See Annex 5 for a detailed status of Task 2.

	aspects. f. Propose targets and make recommendations on: water savings potentials, water reuse, "green measures", etc. where possible.		
Task 4) Training, dissemination and meetings	a. Participation in coordination meetings and workshops (coordinated by the EC). b. Use of existing platforms and tools to disseminate results (e-bulletins, webs, international events). c. Organisation of events: 1 technical meeting with the Tagus RB and Portuguese officials, 1 scientific dialogue, 1 participative workshop (with interested stakeholders from the basin).	EVREN Tagus RBA APAMBIENTE	P

*Table 2. Problems encountered or foreseen and suggested solution, period: 01/01/2014-30/04/2014, PROTAGUS*

<b>Problem encountered or foreseen:</b>	The first problem encountered with the pilot initiative has been the one related to the role of APAMBIENTE. Due to the internal reorganisation of the entity (and within the Tagus River Authority or ARH do Tejo), and to the limited human resources available at the entity to provide data or participate in meetings, the Portuguese partner has suggested to drop off from the project.
<b>Activity and/or Deliverable affected:</b>	Task 1) Establishment of the context and background and overall project management
<b>Planned/suggested solution:</b>	The first solution has been to propose the Portuguese colleagues to act more as observers and supervisors of the work to develop, as EVREN offered to do all the data gathering from available public sources. In addition, the President of the Spanish Tagus RBA has been in contact with the APAMBIENTE President, and has sent an official letter to try to solve this problem and facilitate a dialogue that would find a solution. EVREN is still waiting for a final answer from the Portuguese side.
<b>Problem encountered or foreseen:</b>	Data robustness depending on source and no recorded data for all parameters needed to develop water accounts.
<b>Activity and/or Deliverable affected:</b>	Task 2) Data gathering process
<b>Planned/suggested solution:</b>	EVREN has dealt with these problems in a previous developed project (i.e. HALT-JÚCAR-DES), and was able to successfully implement the action. The proposed solution is to manage the most reliable data (in agreement with the Tagus River Basin Authorities). In addition, and when needed, the team will take into account aggregated data or models (e.g. simulation model for natural regime).
<b>Problem encountered or foreseen:</b>	Selecting the appropriate scale and matching of the political-administrative and natural boundaries of the RBD.
<b>Activity and/or Deliverable affected:</b>	Task 3) Build-up of water accounts



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**Planned/suggested solution:**

EVREN has dealt with these problems in a previous developed project (i.e. HALT-JÚCAR-DES), and was able to successfully implement the action. The proposed solution is to use the “Water Management System” (management unit, union of sub-catchments) in the Spanish area of the basin and look for a similar solution in the Portuguese basin area. In addition, adjustments and estimations will be made in agreement with the Tagus River Basin Authorities indications. The methodology will be described in detailed when developing the water accounts.

### 3. Deliverables

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This chapter provides a comprehensive overview of the specific outputs of the project in the reporting period in terms of deliverables (reports, databases, models, conferences, meetings, leaflets, newsletters, etc.). The progress in terms of deliverables is presented in the form of Table 3, below. The table provides an overview of all project deliverables (even those not started yet), specifying which ones have been completed and which ones are in progress, and the activities undertaken in relation to those deliverables. It highlights potential problems that may have occurred or other constraints, to enable timely corrective actions. The Deliverables correspond to the ones listed in the application and hence in the grant agreement.

*Table 3. Deliverables, period: 01/01/2014- 30/04/2014, PROTAGUS*

Deliverable	Name of Deliverable	Status <sup>3</sup> (C, P, NS)	Brief description of the activities implemented in relation to the Deliverable	Problems, Constraints, Comments
1	Summary note on the status of ECRINS and the EEA activities related to SEEA-W	C	A summary has been made on the SEEA-W specifications, ECRINS system and objectives. Information was gathered from EIONET, EEA and UN. Included in this <b>1st Quarterly Report as annex 1</b> .	<i>No problems were encountered.</i>
2	Tagus River Basin District's features report	C	Information was gathered from the Tagus RBD, including desertification and related studies. Included in this <b>1st Quarterly Report as annex 2</b> .	<i>No major problems were encountered. There was limited information of desertification aspects for the Portuguese part of the basin.</i>
3	Introductory Note of the Project (INP)	C	Information compiled from activities developed in task 1( <b>Establishment of context and background</b> ). Included in this <b>1st Quarterly Report as annex 3</b> .	<i>No major problems were encountered.</i>
4	Informative Brochure	C	The brochure was developed to include objectives, activities to be developed, proposed measures, etc. Included in this <b>1st Quarterly Report as annex 4</b> .	<i>No major problems were encountered.</i>
5	1st Quarterly Report (FQR)	C	This deliverable is the current Quarterly report and presents preliminary gathered data, actions to be applied, first measures, identification of stakeholders and so on. It represents the results of <b>Task 1</b> .	<i>No major problems were encountered.</i>
6	2nd Quarterly Report (SQR)	NS	This report will include similar information as FQR, but will focus on the processes used to gather data and build the water balances. It will be developed after completing <b>Task 2 and 3</b> .	-

<sup>3</sup> C=Completed, P=In Progress, NS=not started (for results already achieved reference may be made to previous reports).



			<b>3.</b>	
7	Recommendations & Assessment Report (RAR)	NS	The report will focus on proposed measures for water management optimization and facing desertification. <b>It will be made as annex of the final report.</b>	-
8	Working Meetings Minutes	P	This deliverable should be a combination of the minutes of all coordination and working team meetings and other relevant events. As well as relevant documents (representing the results of Task 4). Included in this <b>1st Quarterly Report as annex 6</b> .	-
9	International sessions for results and measures dissemination	NS	This deliverable will represent the compilation of dissemination activities in international events (representing results of Task 4)	-
10	Report on WEB-site section	NS	This will be made as an annex of the final report (representing the results of Task 4)	-
11	Final Report (FR)	NS	This report will compile the results of the project and conclusions of meetings and discussions.	-

#### 4. Meetings

This chapter provides an overview of the meetings that took place in the reporting period, including a brief description of their purpose. It consists of one table, namely Table 4 as presented below.

*Table 4 Meetings, 01/01/2014- 30/04/2014, PROTAGUS*

Meeting name	Purpose of the meeting	Partners/Stakeholders involved	Location	Dates
PROTAGUS Kick-off meeting	Agree with partners the roles and future steps and activities	All, except APAMBIENTE	Madrid	28/01/2014
Kick-off meeting of all pilot initiatives	Provide an introductory meeting in which all pilot initiatives are presented and views are exchanged with the COM	All (however, only representatives of EVREN could attend the meeting)	Brussels	5/02/2014
Bilateral meeting EVRE-CHT	Start petition of data and discuss existing problem with the Portuguese partner	EVREN, CHT	Madrid	12/03/2014



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## 5. Other issues

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Due to the problem with the APA, we have not signed the internal grant agreement yet.

The internal agreement is in **annex 7**.

## 6. Updated Work Plan

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This chapter provides an updated outlook of the work plan regarding the whole period of implementation.



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*Table 5. Work plan, 01/01/2014- 30/04/2014, PROTAGUS*

PLANNED DURATION OF THE ACTION													
TIMETABLE FOR EACH STAGE OF THE ACTION SHOWING MAIN DATES AND EXPECTED RESULTS FOR EACH STAGE													
Duration: 12 months,		2014											
Activity / Task		01	02	03	04	05	06	07	08	09	10	11	12
<b>Task 1: Establishment of background and context</b>													
Analysis of the current situation, identification of stakeholders, projects planning, establishment of schedule and objectives, first contacts, etc.													
<b>Task 2: Data gathering process</b>													
Data gathering and analysis, identification of gaps, scales and approach assessment													
<b>Task 3: Build-up of Water Accounts and Recommendations &amp; Assessment Report (RAR)</b>													
Build-up of water accounts, water balances, water savings proposal, SQR & RAR drafting													
<b>Task 4: Training, Dissemination, Deliverables and Meetings</b>		KOM		IWM		IWM	IS	IWM			IS	FM	
<b>Meetings*</b>		CM			CM	MTM			CM				
<b>Main Reports** (summary notes, brochure, minutes and web-site report not reflected)</b>				FQR				SQR			RAR	FR	

KOM: Kick-Off Meeting & MTM: Mid Term Meeting

FM: Final Meeting.

IWM: Internal working team meeting (including technicians from EVREN, and experts from the collaborating entities). 3-4 meetings have been envisioned; two in the first months to establish the background, the objectives and define schedules and works distribution, and one or two towards the end to complete works and reports.

CM: Coordination Meetings (number to be confirmed by DG ENV, but 3 have been considered. It is expected that experts from EVREN, and representatives from the two collaborators - Tagus RBAs- will participate in these meetings).

IS: International sessions. Possible international events in which dissemination of the project could take place.

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FQR: First quarterly report

SQR: Second quarterly report

RAR: Recommendations Assessment Report

FR: Final report





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## 7. Annexes

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Agendas and minutes

1	Summary note on the status of ECRINS and the EEA activities related to SEEA-W
2	Tagus River Basin District's features report
3	Introductory Note of the Project (INP)
4	Informative Brochure
5	Detailed works on Task 2
6	Meeting documents (Agenda, presentations, minutes and others)
7	Internal Grant Agreement



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## **Annex 1. Summary note on the status of ECRINS and the EEA activities related to SEEA-W**

## **Summary note on the status of ECRINS and the EEA activities related to SEEAW**

### **SUMMARY OF SEIS, ECRINS AND SEEAW**

#### **Introduction**

In 2008, the EC launched a communication on the Shared Environmental Information System (**SEIS**<sup>1</sup>), which states that it is vital for the European Union to have an information system based on the latest information and communication technology (ICT) that will provide decision-makers at all levels (local to European) with real-time environmental data, thus allowing them to make immediate and life-saving decisions to tackle challenges (as for instance, adaptation to climate change). The main aim of SEIS is to improve the collection, exchange and use of environmental data and information across Europe. Their existing systems and processes would be simplified, streamlined and modernised, including being web-enabled. The overall system would be decentralised but integrated. Quality, availability, accessibility and understanding will be improved as a result (EEA, 2014<sup>2</sup>).

SEIS is based on seven ‘principles’:

- Managed as close as possible to its source.
- Collected once, and shared with others for many purposes.
- Readily available to easily fulfil reporting obligations.
- Easily accessible to all users.
- Accessible to enable comparisons at the appropriate geographical scale, and citizen participation.
- Fully available to the general public, and at the national level in the relevant national language(s).
- Supported through common, free open software standards.

There are several initiatives contributing to the implementation of SEIS, including:

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<sup>1</sup> Communication from the Commission to the Council, the European Parliament, the European Economic and Social Committee and the Committee of the Regions - Towards a Shared Environmental Information System (SEIS) COM(2008)46 final <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2008:0046:FIN:EN:PDF>

<sup>2</sup> <http://www.eea.europa.eu/about-us/what/shared-environmental-information-system-1>

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- **WISE:** water information System for Europe. Initially designed as a reporting tool in the context of the Water Framework Directive (WFD), it has now extended to integrate reporting from other water-related directives.
  - Directive 2007/2/EC (**INSPIRE**) establishing an infrastructure for spatial information in Europe.
  - Directive 2003/4/EC on public access to environmental information (the **Aarhus** directive).
  - The Global Monitoring for Environment and Security (**GMES**) initiative, which aims to provide operational information services based on Earth monitoring data obtained from satellites and observation on water, air and land.
  - Group on Earth Observation (GEO), aiming at building a Global Earth Observation System of Systems (**GEOSS**) (data access and sharing).
  - **EIONET:** a partnership network of the European Environment Agency (EEA) and its member and cooperating countries involving approximately 1000 experts and more than 350 national institutions. The network supports the collection and organization of data and the development and dissemination of information concerning Europe's environment
  - **SIIF<sup>3</sup>** (Structured Implementation and Information Frameworks): A SIIF aims, together with the range of SEIS initiatives, to help Member States set up transparent information systems that make information accessible online. For example, users would be able to identify on a map abstraction points, source protection zones, treatment plants and distribution networks and have links to related information such as leakage reduction programmes. The basic idea of a SIIF is that, for every key obligation in a directive, it would be useful to define how the relevant compliance and implementation information can be organised and presented online by Member States (or by others, including the Commission, where the information is jointly managed).

#### **European Catchment and Rivers Network System (ECRINS)**

ECRINS is an approach to spatially determine rivers, lakes, catchments and related objects as a topological network, and defines the Functional Elementary Catchment (FEC) as the smallest areal grain of the system. It is an operational or calculable catchment and rivers reference layer, representing the priority to implement the different methodologies recognized in the SEIS development (production of the water accounts) and development of SoE (state of the environment reports from EEA). The needs for the production of water accounts and the preparing of the SoE 2010 fostered the preparation of a catchment and river reference layer

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<sup>3</sup> Communication of 7 March 2012 (COM(2012) 95. Improving the delivery of benefits form EU Environment measures: building confidence through better knowledge and responsiveness. <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2012:0095:FIN:EN:PDF>

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ECRINS is thus a conceptual model, that fully connects systems of watersheds, rivers, lakes, monitoring stations, dams made from the JRC CCM2.1 and many other sources (for instance, obtains data on lakes or dams from the EuroRegionalMap or ERM, from Edred2). Compared to CCM<sup>4</sup>, ECRINS offers a smaller number (138,000 instead of >2,000,000) of elementary catchments which average size is 92km<sup>2</sup>. The version 1.0 of ECRINS was released in 2010.

Only the main drainage system, nevertheless comprising ~1,4 million km of rivers has been kept. The IG is organized in four folders. the "hydrography" provides the current and archived layers of ECRINS, the "documentation" provides the construction, coding and data models, "Ancillary data" provides computed data (e.g. Corine LC per elementary catchment) and "WISE data" the publicly available data sets reported under the WFD and which end host is normally ECRINS. When updated data sets (e.g. lakes and dams, river naming, etc.) become available, they will be added in the adequate folder.

Available sources:

- “ECRINS – EEA hydrographic data set” of Hydrography (EcrAncl, Ecrins drainage lines, ECRINS FECs and Ecrins gazetteer – river names).
- <http://projects.eionet.europa.eu/ecrins>

### **System of Environmental-Economic Accounting for Water (SEEA-W)**

#### Introduction to SEEA

The system of Integrated Environmental and Economic Accounting (SEEA) of the United Nations Statistics Division was created in 1993 and modified on 2002. Its purpose is to integrate environmental and economic information in a common, comprehensive and coherent way to measure the contribution of the environment in the economy and the impact this latter has on the environment. The system provides a number of methodological options, including different activities in environmental accounting, from which users can choose the most suitable for their needs as the assessment of natural assets or methodologies for assessing natural and environmental services. It establishes indicators and statistical methods to measure these interactions. What this system is not intended for is to establish the optimal use of the environment for economic uses, but to obtain through the combined use of different measures, a balance between human and environmental needs. Since there is no general consensus on how to incorporate environmental accounting in national accounts, the SEEA recommends the use of *satellite accounts* that integrate environmental aspects without changing deeply traditional accounting systems (e.g. water accounts: SEEAW).

In short, the SEAA was created so economists and policy makers could incorporate environmental aspects into national economies, assess the degradation for the environment and natural resources linked to economic activities, and ultimately to establish which type of development and degree of sustainability was desired by each country.

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<sup>4</sup> Developed from the Joint Research Centre (JRC) Catchment Characterisation and Modelling (CCM): pan-European database of river networks and catchments. cause-effect relationships between drainage networks and associated drainage basins.  
<http://ccm.jrc.ec.europa.eu/php/index.php?action=view&id=23>

The *satellite accounts*, linked to National Account Systems, complement the available information, but do not interfere with the calculation of key macroeconomic indicators (e.g. GDP). That is, without overloading or distorting the central accounting system they provide expanded information on specific issues which have a special social interest, using complementary concepts, expand the information on their specific relationship to human activities, associate databases and identify potential gaps in them.

In Spain the National Statistics Institute (INE) has implemented in recent years (1995-2010) different *satellite accounts*: water (1997-2001; 2000-2006<sup>5</sup>), air emissions, expenditure of environmental protection, materials flow and forest resources, based on surveys.

### **SEEAW**

The SEEA incorporates a section on water accounts on the SEEA-2003 report (Chapter 8), and the final draft of SEEAW was presented on 2005 (and updated in recent years). Some summary points of the updated report<sup>6</sup> include:

- *The System of Environmental-Economic Accounting for Water (SEEAW) provides a conceptual framework for organizing the hydrological and economic information in a coherent and consistent manner. Both the SEEA-2003 and SEEAW use as basic framework the 1993 System of National Accounts (1993 SNA) (CEC et. al., 1993) which is the standard system for the compilation of economic statistics and derivation of economic indicators, the most notable being gross domestic product (GDP).*
- *The SEEAW conceptual framework is complemented with a set of standard tables focusing on hydrological and economic information. It also includes a set of supplementary tables covering information on social aspects which permits the analysis of the interaction between water and the economy. The set of tables, standard and supplementary, were designed with the objective of facilitating the compilation of the accounts in countries and to obtain information which is comparable across countries and over time.*
- *The SEEAW includes as part of its standard presentation the following information:*
  - a) *stocks and flows of water resources within the environment;*
  - b) *pressures of the economy on the environment in terms of water abstraction and emissions added to wastewater and released to the environment or removed from wastewater;*
  - c) *the supply of water and the use of water as input in the production process and by households;*

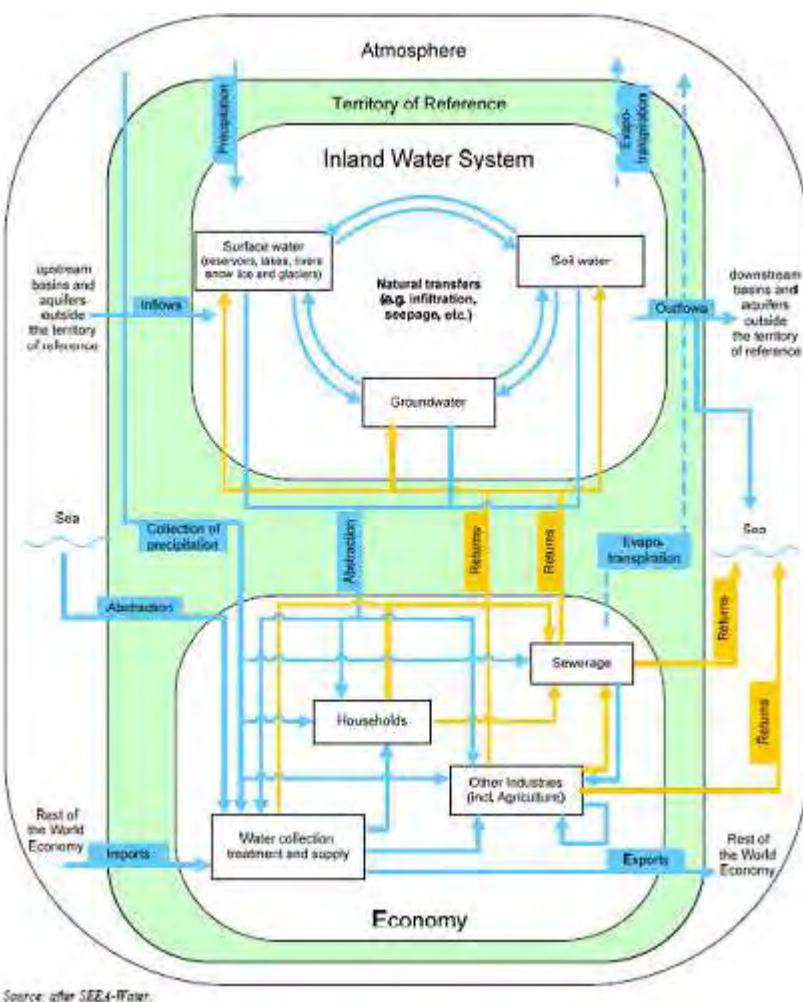
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<sup>5</sup> The series 2000-2006 can be consulted in: <http://www.ine.es/jaxi/menu.do?type=pcaxis&path=/t26/p067/p02/agua00-06&file=pcaxis>

<sup>6</sup> <http://unstats.un.org/unsd/envaccounting/seeaw/seeawaterwebversion.pdf> : 2012 report that highlights the importance of IWRM, and WFD principles. However, it indicates that economic accounts are generally compiled at the level of administrative regions.

- d) the reuse of water within the economy;
- e) the costs of collection, purification, distribution and treatment of water, as well as the service charges paid by the users;
- f) the financing of these costs, that is, who is paying for the water supply and sanitation services;
- g) the payments of permits for access to abstract water or to use it as sink for discharge of wastewater;
- h) the hydraulic stock in place, as well as investments in hydraulic infrastructure during the accounting period.
- i) Quality accounts (experimental modules).

An overview of the SEEA-Water framework is presented in the following picture, which provides a simplified presentation of the economy, the system of water resources and their interactions:



## Acronyms list

Acronym	Meaning
<b>CCM</b>	Catchment Characterisation and Modelling
<b>ECRINS</b>	European Catchment and Rivers Network System
<b>EEA</b>	European Environment Agency
<b>EIONET</b>	European Environment Information and Observation Network
<b>GEO</b>	Group on Earth Observation
<b>GMES</b>	Global Monitoring for Environment and Security
<b>IWRM</b>	Integrated Water Resources Management
<b>SEEA</b>	System of Integrated Environment and Economic Accounting
<b>SEIS</b>	Shared Environmental Information System (EC Communication, 2008)
<b>SEIS-ENP</b>	SEIS-European Neighbourhood Policy
<b>SIIF</b>	Structured Implementation and Information Frameworks
<b>SoE</b>	State of the Environment
<b>WFD</b>	Water Framework Directive
<b>WISE</b>	Water Information System for Europe

## Definitions:

**Desertification:** “Desertification means land degradation in arid, semi-arid and dry sub-humid areas resulting from various factors, including climatic variations and human activities”. “Desertification means degradation of land and vegetation, soil erosion and the loss of topsoil and fertile land in arid, semi-arid and dry sub-humid areas, caused primarily by human activities and climatic variations. Drought can trigger or aggravate desertification”<sup>7</sup>.

“Desertification is a condition of human-induced land degradation that occurs in arid, semi-arid and dry sub-humid regions (...) and leads to a persistent decline in economic productivity (>15% of the potential) of useful biota related to land use or a production system. Climatic variations intensify the decline in productivity, restorative management moderates it.”<sup>8</sup>

**Water scarcity** is defined as a situation where insufficient water resources are available to satisfy long-term average requirements. It refers to long-term water imbalances, where the availability is low compared to the demand for water, and means that water demand exceeds the water resources exploitable under sustainable conditions (definition stated in the Communication on water scarcity and droughts). **Droughts**, on the other hand, represent relevant temporary decrease of the average water availability, refer to important deviations from the average levels of natural water availability and are considered natural phenomena. The assessment carried out in the past thirty years reveals that drought events have regularly

<sup>7</sup> United Nations Convention to Combat Desertification (UNCCD).

<sup>8</sup> Jagdish C. Katyal and Paul L.G. Vlek, in Desertification. Concept, Causes and Amelioration, ZEF-Discussion Papers in Development Policy, No. 33, Bonn, October 2000, p. 16.

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occurred. However, the duration of each event and the area and population affected have varied throughout this period.<sup>9</sup>

The combination of factors and processes such as drought, aridity, erosion, forest fires, and consequent destruction of the vegetation cover, and overexploitation of water resources, can lead to desertification and accelerate their processes and impacts on the environment, resulting in arid or semi-arid regions with slow and difficult recovery. Therefore, drought, water scarcity and desertification are directly related terms

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<sup>9</sup> Drought management plan report - Including agriculture, drought indicators and climate change aspects. Water Scarcity and Droughts Expert Network. 2008, EC. [http://ec.europa.eu/environment/water/quantity/pdf/dmp\\_report.pdf](http://ec.europa.eu/environment/water/quantity/pdf/dmp_report.pdf)



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## **Annex 2. Tagus River Basin District's features report**

## **TAGUS RIVER BASIN FEATURES**

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## **TAGUS RIVER BASIN FEATURES**

### **1. INTRODUCTION**

The main problem of desertification in Spain has been closely linked to the planning and strategy of the forestry sector (Spanish Forest Strategy, adopted on March 8, 1999 by the Environmental Sectorial Conference). However, beyond the forest desertification scope, struggles have included statements and proposals from all sectors involved, particularly in the agricultural sector and the ones related to water resources management.

Therefore, since 1981 and through the LUCDEME Project, Spain became the first developed country to collect recommendations of the United Nations in the fight against desertification. Following the summit in Nairobi (1977) and through the Rio Summit (1992), on June 17, 1994 in Paris, the minutes of the United Nations Convention to Combat Desertification were approved, which entered into force in 1996. The countries that have ratified the convention have developed national plans through the commitment of the agreement. In the case of Spain this was done in August 2008, and the National Action Program to Combat Desertification (PAND, for its acronym in Spanish) was published.

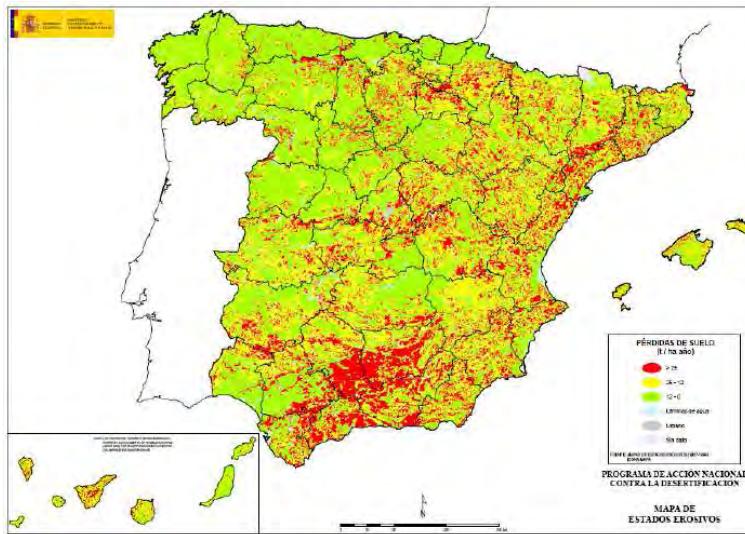


Figure 1. Erosion states map. Source: National Action Program to Combat Desertification (PAND, 2008)

Taking into account erosion statuses map in Spain, as well as the decrease of rainfall in the last two decades mainly, Spanish basins that are suffering more desertification are: Ebro, Tagus, Jucar and basis of the south part of the country.

The Tagus river basin is an international basin that extends for territories of Spain and Portugal. It has a total area of approximately 81,310 km<sup>2</sup>, of which 25.666 km<sup>2</sup>, or 32%, area in Portuguese territory and 68% in Spanish territory. It should be noted that of the 25 666 km<sup>2</sup> (Portuguese territory), 748 km<sup>2</sup> is the area of coastal water bodies and transitional water bodies.

The Spanish part of the Tagus river basin district is bordered to the north by the basin of Duero and Ebro rivers, on the east by the Jucar, and on the south by the Guadiana river basin, with an area of about 55.781 km<sup>2</sup>. The Tagus river basin continues to the west into Portugal. It is situated in the central area of the Iberian Peninsula, bounded on the north by the central range of mountains, on the east by the Iberian range of mountains and on the south by Toledo Mountains. It extends into five autonomous regions: Extremadura, Madrid, Castilla y Leon, Aragon and Castile-La Mancha, with a total of 12 provinces: Ávila, Badajoz, Cáceres, Ciudad Real, Cuenca, Guadalajara, Madrid, Salamanca, Segovia, Soria, Teruel and Toledo. In addition, four provincial capitals lie within the basin (Cáceres, Madrid, Guadalajara and Toledo). The autonomous region which occupies the largest area is Castilla-La Mancha, while the entire Autonomous Region of Madrid is virtually within the basin. The total population is 7.833.089 inhabitants (INE Census, January 1, 2010). The population density of the river basin is about 140 inhabitants/km.

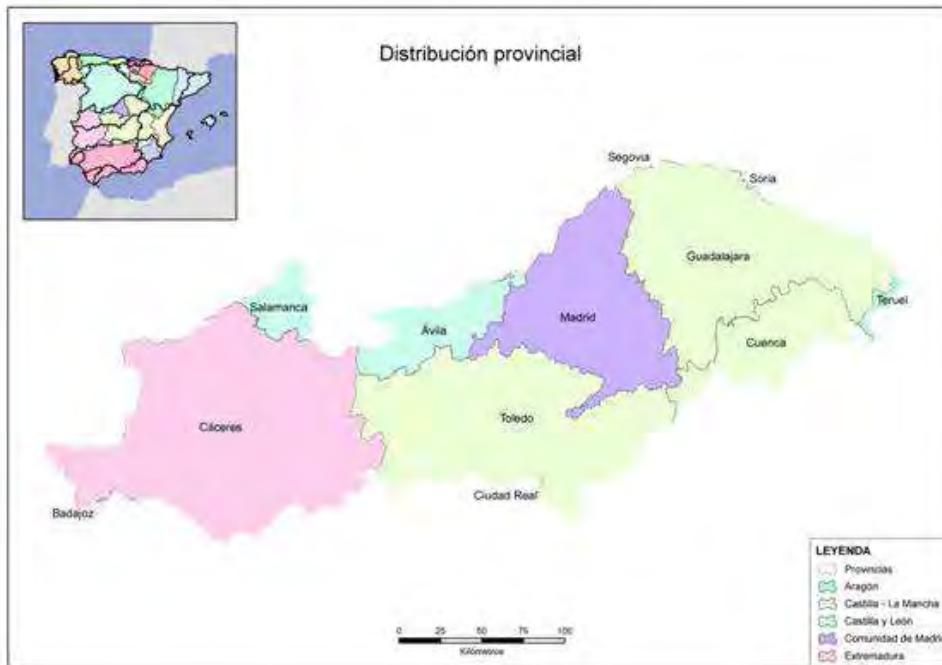


Figure 2. River basin distribution by provinces in Spanish side. Source: Tagus River Basin Authority

According to the Decree-Law n. 347/2007, of October 19, the River Basin district is bounded by the Spanish territory on the east by the Lis and Monego river basins on the west and on the north and by Duero River Basin to the northeast. The south and southeast of the basin borders the Sado and Guadiana basins, respectively. In the Tagus River Basin are delimited 425 surface water bodies and 16 groundwater bodies.

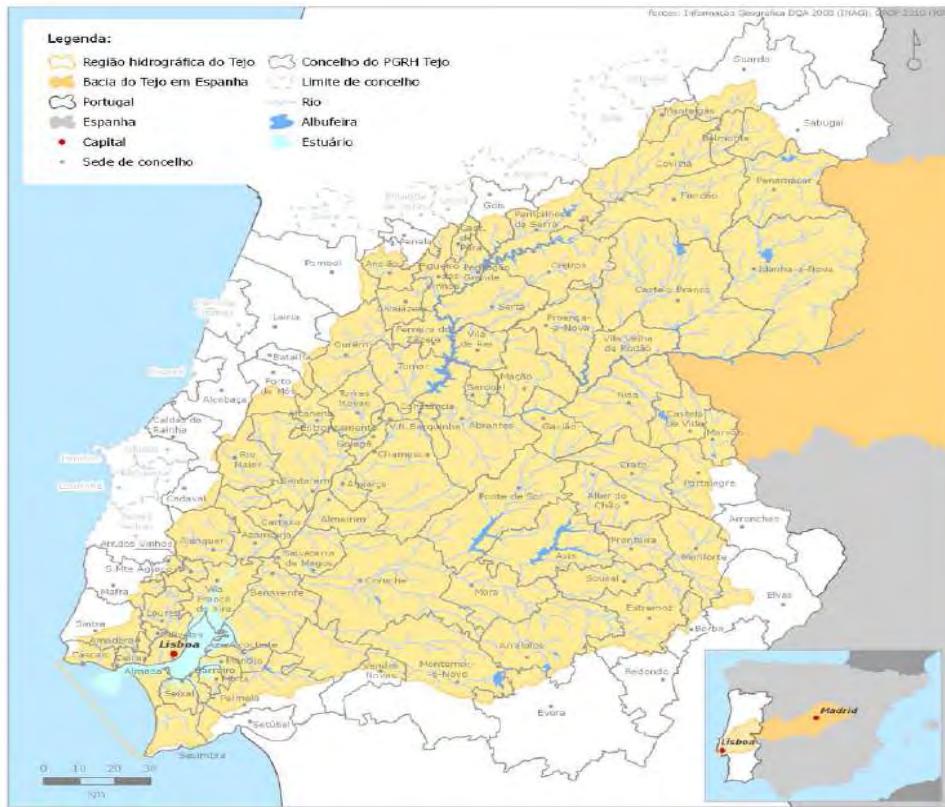


Figure 3 Geographical location of the Portuguese side of the Tagus River Basin District. Source: PLANO DE GESTÃO DA REGIÃO HIDROGRÁFICA DO TEJO

## 2. TAGUS RBD'S CLIMATE FEATURES:

The Tagus River Basin District is located in an area characterised by a Mediterranean climate strongly continental with the particularities related to altitude, latitude and the greater or smaller distance to the Atlantic Ocean.

With regard to temperatures, the most distinctive feature is its seasonal variation, with hot dry summers and cold winters. This peculiarity is due to the effect of the Azores Islands anticyclone during the summer period and because of the entry of oceanic and continental cold air during the winter. It is noteworthy that some of the higher areas constitute one of the coolest peninsular sites.

As for temperatures, there are colder mountain cores where average temperatures are between 8 and 10°C, and the warmer lower areas where average temperature values obtained are between 13 and 17°C.

The river basin has an average rainfall of 648 mm (1940-2006), seasonally distributed (with maximums in spring and autumn) and a marked distribution according to altitude. Therefore, the most populated areas are those that support the lower values of rainfall. This feature leads to the overall imbalance between areas that generate the resources and those that demand them.

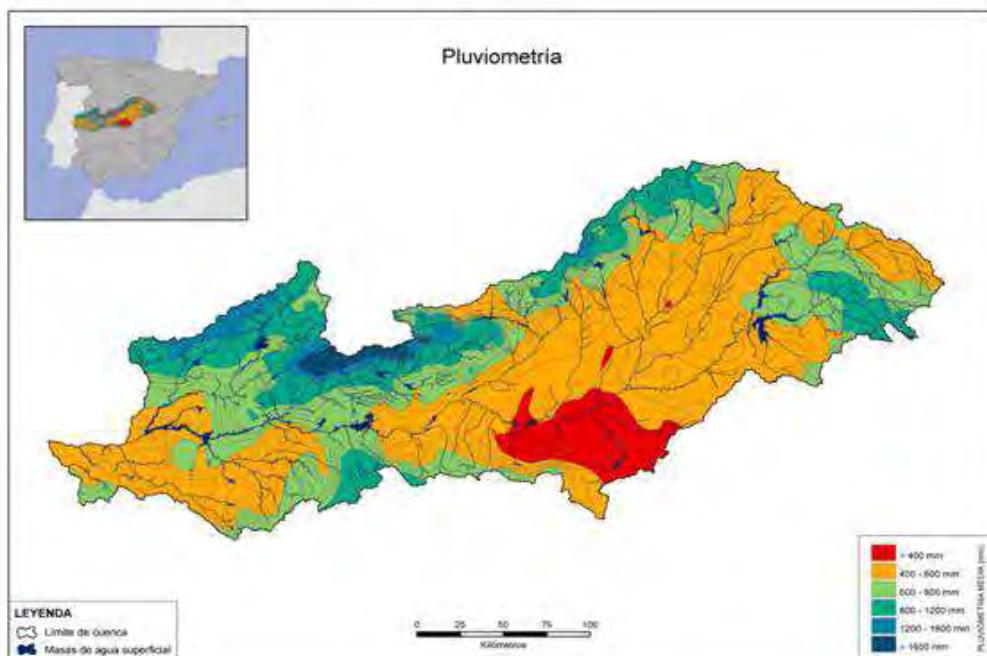


Figure 4. Precipitation rate in the Tagus RB (1940-2006). Source: Tagus River Basin Authority

The Spanish part of the basin is drained by more than 63.000 km of rivers. The total average contribution of the Tagus river basin, including the total contributions in transboundary water bodies, in the period 1940-2006 is 10.210 hm<sup>3</sup>. Series present a very high variability, with a standard deviation of 5.614 hm<sup>3</sup> and a coefficient of variation of 0.55. For the period 1980-2006, the average contribution is 8.273 hm<sup>3</sup> with a standard deviation of 5.158,7 hm<sup>3</sup> and a coefficient of variation of 0.62. The direct use of groundwater is below the national average. However, in practice, there is a joint operation due to the natural process of interaction between surface and groundwater phases. There are 24 groundwater bodies, none of them shared with Portugal.

### 3. DROUGHTS HISTORY IN THE TAGUS RB:

Drought is a recurring phenomenon in the Tagus river basin district, compromising the availability of water resources to meet the demands and ecological requirements. The

initial cause of any drought is low rainfall (meteorological drought) which results in a shortage of water resources (hydrological drought) needed to supply the demand. Drought is also difficult to predict, but specific plans and actions can help to minimise the negative socio-economic and environmental impacts.

Features of meteorological droughts in the Tagus river basin include:

- Often hyper-annual dry cycles are produced with below average rainfall.
- The dry years occur at a frequency slightly higher than the wet ones, and with less intensity, although this trend is not very pronounced.
- The cycle time is quite variable with an average slightly higher than three years, whether dry or wet.
- There is no clear correlation between the duration of cycles and intensity.

There is historical evidence of droughts in Spain, and in the Tagus river basin in particular, since the third century BC. The progressive increase in the degree of regulation in the basin, developed mainly along the second half of the twentieth century, has led to the loss of social impact of meteorological drought, except for rain-fed crops, which have resulted in recent hydrological droughts that are really affecting the operation of services. Among the most significant droughts occurred in the basin the following can be highlighted:

1. Between the years 1943-44 to 1944-45. Spain suffered a situation of extreme meteorological drought which led almost immediately to a hydrological drought due to the low level of existing regulation at the time, showing the gap between consumption needs and available water resources. The drought reached only two years but was particularly intense with a percentage reduction of the contributions of about 70% (average rainfall of 429 mm). Following this negative experience, a strong public policy work focused mainly on increasing storage capacity was encouraged, but also important, on facilitating the flow transportation and even the connection between different basins.
2. From 1979-80 to 1982-83 there was a drought that affected a large part of the Iberian Peninsula and had an appreciable intensity and duration (four years with an average rainfall of 514 mm). Its effects resulted in a significant decrease

in the production of agricultural activity and increased the perforations of groundwater bodies, with clear signs of overexploitation and salinization of water in some of the Spanish basins. In response, the Ministry of Internal Affairs introduced by order of June 27, 1983 the Special Emergency Plan for Drought, still applicable today in critical alarm situations. The plan established guidelines for Civil Protection coordinated action to address the emergency situation then prevailing in large areas of the country.

3. From 1990-91 to 1994-95, both for its duration (5 years) and its intensity as average rainfall barely reached 500 mm per year. This drought affected millions of people, and had an estimated economic cost of \$10 billion at the time, according to CRED (Center for Research on the Epidemiology of Disasters, 1995). The biennium between October 1991 and September 1993 was the driest recorded period, which led to some water management systems to an extreme situation in which it was necessary to adopt all kind of measures (emergency works, restrictions on consumption, increased surveillance in the irrigated areas, etc.).
4. From 2004-05 to 2008-2009 there was a drought with a rainfall average of 575 mm and minimum values of 401 and 500 mm in the years 2004-05 and 2008-09 respectively. The average accumulated rainfall in the basin in the first year was the lowest in the time series available since 1940/1941. In spite of this intense rainfall deficit, economic impacts of this drought to date can be classified as moderate due to the water stored level in reservoirs at the beginning of the hydrological year 2004-05 and the input received during the months of October and November 2004 and in the spring of 2006. The quality of water was also affected by drought, especially in parameters such as temperature and conductivity, which increased. The policy measures adopted are summarised as:
  - Royal Decree-Law 10/2005, of 20 June, approving urgent measures to palliate impacts in the agricultural sector due to drought and other meteorological adverse conditions.

- Royal Decree 1265/2005, of 21 October, approving exceptional administrative measures for the management of water resources and to correct drought effects in the Tagus, Segura and Júcar basins.
- Royal Decree-Law 15/2005, of 16 December, for urgent measures for the regulation of water use rights transactions.
- Royal Decree of 10 March 2006, that regulates urgent Works for improvement and consolidation of irrigated areas, with the aim of obtaining water savings to mitigate impacts caused by drought.

In addition to these regulatory measures, the Ministry of Environment undertook the following actions: Elaboration of protocols, setting up the emergency activities catalog, preparation of monitoring reports of the drought, emergency works and actions to achieve an appropriate degree of coordination between administrations in different geographical areas of involvement and participation of key economic and social actors in decision-making and promote public information and transparency of information (for that, the National Drought Observatory was created <http://www.magrama.gob.es/es/agua/temas/observatorio-nacional-de-la-sequia/> )

In relation to drought in the Portuguese side of the River Basin District, the longest episode began in February 1973, which lasted 46 months. More recently, the commonly called "drought of 2005" reveals that for 12 months, more than 40% of the river basin was in extreme drought, and for 17 months, more than 40% of the basin was in moderate, severe or extreme drought.

## **4. DROUGHT MANAGEMENT TOOLS**

### **4. 1. DROUGHT MANAGEMENT PLAN**

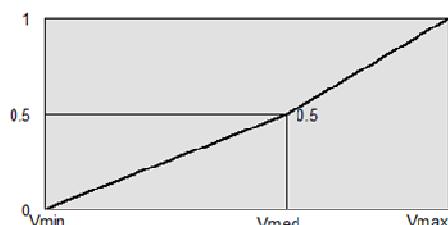
According to the Spanish Law 10/2001, of 5 July, the National Hydrological Plan, Spain has developed Special Drought Plans for all River Basins, as new legal instrument for managing drought in Spain. These plans are mainly aimed at identifying the conditions and schedule the establishment of specific measures to prevent or mitigate drought effects.

The Drought Management Plan of the Tagus river basin (DMP) was published in March 2007. The main objective of the DMP is the identification of measures of control, risk

assessment, organisation of decision making and implementation of mitigation measures which are required to minimise the frequency and intensity of water shortage conditions, and to reduce environmental, economic and social impacts caused by drought situations.

Three key issues are tackled in the Drought Management Plan: When to act, what to Do, and who are the responsible administrations for managing the drought. The decision of when to act is of great importance as to mitigate the effects of droughts is essential to anticipate them. In addition, the Plan establishes the sequence of activation of the mitigation measures, depending on the state in which resources are located in the basin and forecasts on their evolution. It is also important to identify those responsible for implementation and monitoring of such measures to ensure the plan's adoption and coordination between institutions and public or private entities related to the problem.

## Indicators assessment and thresholds definition



$$\begin{aligned} & \text{Si } V_i \geq V_{med} \Rightarrow I_e = \frac{1}{2} \left[ 1 + \frac{V_i - V_{med}}{V_{max} - V_{med}} \right] \\ & \text{Si } V_i < V_{med} \Rightarrow I_e = \frac{V_i - V_{min}}{2(V_{med} - V_{min})} \end{aligned}$$

**Historical value indicator**

Risk	Status index value	Status
Very low	0.75 – 1,00	NORMAL
Low	0.50 – 0.75	
Medium	0.30 – 0.50	PREALERT
High	0.15 – 0,30	ALERT
Very high	0.00 – 0.15	EMERGENCY

**Hydrologic status classification**

Figure 5 Indicators assessment and thresholds definition. Source: Spanish General Directorate for Water

The plan defines three thresholds for each indicator (pre-alert, alert and emergency), which define four situations associated with different levels of severity of drought:

- In normal condition the values of the indicators are above pre-alert threshold and there is no need for the adoption of specific drought measures.
- Pre-alert condition: the values of the thresholds range from pre-alert and alert and there is already need for the implementation of preventive measures for demand management, and monitoring and control of resources.
- Alert condition: the indicator values are between pre-alert and emergency. This scenario requires the implementation of measures of demand management, resources conservation and mobilization of resources to maintain the situation.
- State of emergency: the indicators are already in values below the emergency threshold. This is a critical situation in which are unavoidable exceptional measures to ensure urban water supply, flow, volumes and ecological levels; supply to nuclear power plants and, as far as possible, maintenance of woodland in agricultural crops. Each level shall automatically involve the activation of a set of action measures to prevent or mitigate the effects of drought.

## Mitigation drought measures

TYPES OF MITIGATION MEASURES							
Indicator	1-0.5	0.5-0.4	0.4-0.3	0.3-0.2	0.2-0.15	0.15-0.1	0.1-0
Status	Normal	Pre-alert		Alert			Emergency
Objective	Planning		Information-control		Conservation		Restrictions
Type of measure		Strategic		Tactics		Emergency	

Figure 6 Mitigation drought measures. Source: Spanish General Directorate for Water

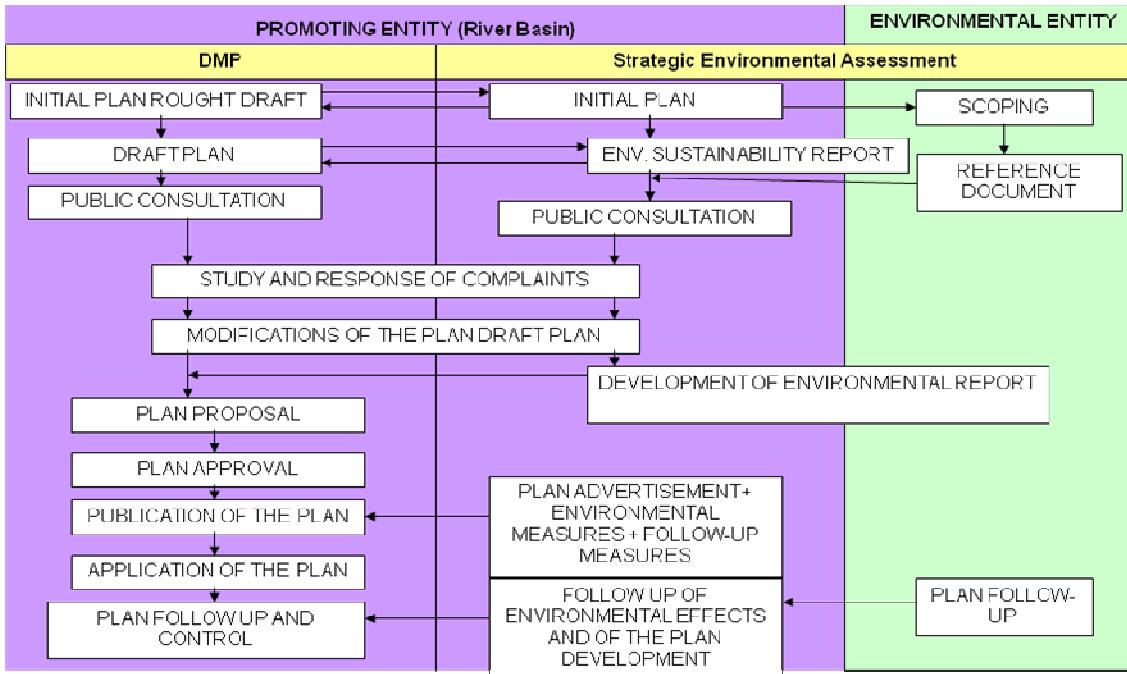


Figure 7 Development process of the DMPs. Source: Spanish Ministry of Environment and Rural and Marine Affairs

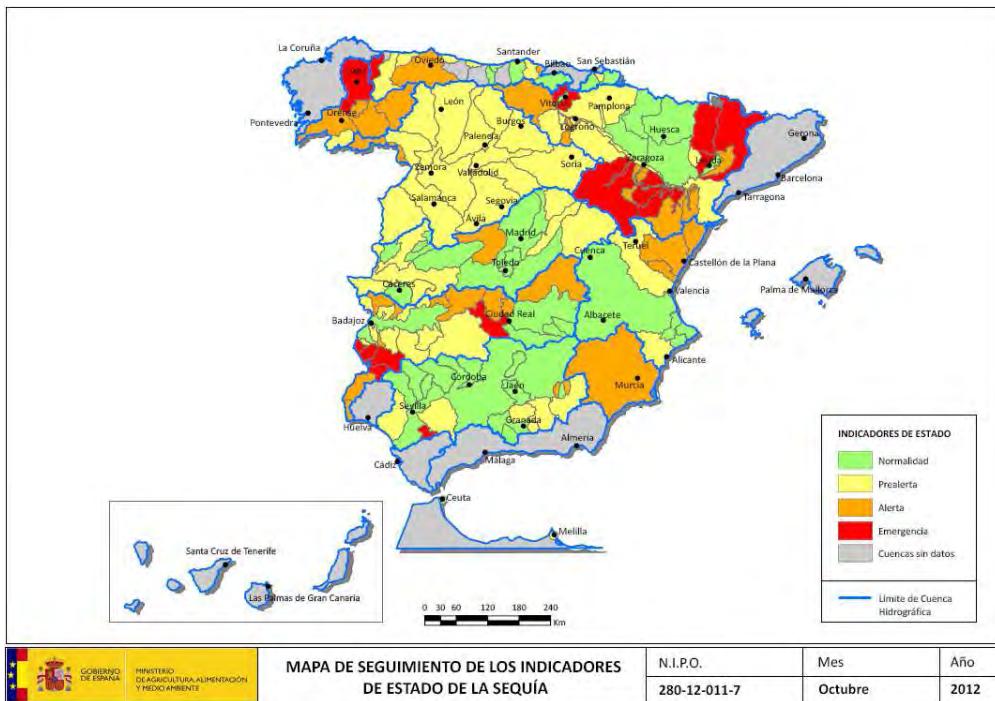


Figure 8 Map of the Drought's Status Index per Water Exploitation System in Spain. October 2012. Source: Ministry of Agriculture, Food and Environment.



Annex 2: Tagus River Basin Features.

Figure: 1 Tagus Drought Monitoring Map. October 2012. Source: Tagus RBA.

There is a clear distinction between strategic, tactical and emergency measures. Summarizing, the main groups of measures against droughts' effects would be:

The **Strategic Measures** are long-term institutional and infrastructural actions, as part of water planning (storage and regulation works, policy and management purposes), and that are outside of the DMP competences, by their own nature. They require long period for implementation, big budgets, political negotiation, social acceptance and possibly legislative changes.

The **Tactical Measures** are short-term actions, planned and validated in advance under the Drought Management Plan. Such measures have been studied on historical situations and adopted once the drought situation is confirmed by the system of indicators.

Finally, the **Emergency Measures** are adopted late in the drought and vary depending on the severity of it and its extent or degree of affection to the basin.

Since their implementation, the DMPs have provided the bases for a planned drought management, establishing drought phases and describing the measures that should be progressively applied and the needed monitoring and follow-up processes. Furthermore, the Plans include methods and measures previously agreed by all participating stakeholders: civil society, public administration and scientific community. In addition, groups of users take all supplementary decisions in organised watershed boards. The main results include a more controlled and planned management of droughts that has allowed prioritising uses, ensuring public urban supply and minimising environmental degradation by protecting the most vulnerable water ecosystems.

## 5. DESERTIFICATION IN THE TAGUS RB

The already mentioned National Action Plan to Combat Desertification (PAND), published by the Ministry of Rural and Marine Environment, shows the causes of advance of the aridity phenomena in the Mediterranean region (including the headwaters of the Tagus River) are “the overexploitation of aquifers and salinization of soils”

The program of measures of the recently published Tagus River Basin Management Plan includes some measures aimed at reducing the risk of desertification, among which the following can be highlighted:

- In relation to the objective of improving the environment and the natural environment, the plan will enhance biodiversity and the sustainable management of forest ecosystems, ensuring ecological functionality, in order to reduce or prevent desertification processes caused by the disappearance of forest cover fires or disasters
- In addition, the PAND is in itself also a complementary measure to combat extreme hydrological situations (Article 59 of the catalogue of measures).

One of the infrastructures that have contributed to the loss of flow and biodiversity in the river basin is the Tagus-Segura transfer.



Figure 9 Water Transfer, Tagus-Segura



Figure 10 Tagus river in Talavera de la Reina city during the 2005-06 drought

## SOURCES

TAGUS RIVER BASIN MANAGEMENT PLAN

[HTTP://WWW.CHTAJO.ES/INFORMACION%20CIUDADANO/PLANIFICACIONHIDROLOGICA/PLANIF\\_2009-2015/PAGINAS/PROPPROYPHC\\_2009-2015.ASPX](HTTP://WWW.CHTAJO.ES/INFORMACION%20CIUDADANO/PLANIFICACIONHIDROLOGICA/PLANIF_2009-2015/PAGINAS/PROPPROYPHC_2009-2015.ASPX)

NATIONAL DROUGHTS OBSERVATORY (ONS)

<HTTP://WWW.MAGRAMA.GOB.ES/ES/AGUA/TEMAS/OBSERVATORIO-NACIONAL-DE-LA-SEQUIA/>

SPECIAL PLAN OF ACTION IN SITUATIONS OF WARNING AND EVENTUAL DROUGHTS OF THE TAJO RIVER BASIN (PES PLAN ESPECIAL DE SEQUÍAS))

<HTTP://WWW.CHTAJO.ES/DEMARCATAJO/SEQUIASYAVENIDAS/PAGINAS/PES.ASPX>

MINISTRY OF AGRICULTURE, FOOD AND ENVIRONMENT <WWW.MAGRAMA.ES>

TAGUS RIVER BASIN AUTHORITY <WWW.CHTAJO.ES>

NATIONAL ACTION PROGRAM TO COMBAT DESERTIFICATION (PAND)

[HTTP://WWW.MAGRAMA.GOB.ES/ES/BIODIVERSIDAD/PUBLICACIONES/PAND\\_AGOSTO\\_2008\\_TCM7-19664.PDF](HTTP://WWW.MAGRAMA.GOB.ES/ES/BIODIVERSIDAD/PUBLICACIONES/PAND_AGOSTO_2008_TCM7-19664.PDF)

CONVENTION TO COMBAT DESERTIFICATION (UNCCD)

<HTTP://WWW.UNCCD.INT/EN/REGIONAL-ACCESS/PAGES/DEFAULT.ASPX>

PLANO DE GESTÃO DA REGIÃO HIDROGRÁFICA DO TEJO

[HTTP://WWW.APAMBIENTE.PT/\\_ZDATA/PLANOS/PGRHS-TEJO/RNT%5CPGRHTEJO\\_RNT.PDF](HTTP://WWW.APAMBIENTE.PT/_ZDATA/PLANOS/PGRHS-TEJO/RNT%5CPGRHTEJO_RNT.PDF)

AGÊNCIA PORTUGUESA DO AMBIENTE

<HTTP://WWW.APAMBIENTE.PT/?REF=16&SUBREF=7&SUB2REF=9&SUB3REF=834#>



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DEL TAJO



### **Annex 3. Introductory Note of the Project (INP)**

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## Introductory Note of the Project (INP)

### **Pilot project on water balances in the Tagus River Basin (PROTAGUS)**

**Framework:** Open call for proposals Desertification 2012 – 2013 in the framework of the Preparatory Action on development of prevention activities to halt desertification in Europe "Halting Desertification in Europe". DG Environment, European Commission.

**Link:** [http://ec.europa.eu/environment/funding/desertification\\_13.htm](http://ec.europa.eu/environment/funding/desertification_13.htm)

**Start date:** January 2014

**Duration:** 12 months

**Total budget:** 122.087€ (75% financed by the EC)

**Leader:** Evaluación de Recursos Naturales (EVREN, S.A) -Spanish Environmental Consulting Firm-

**Partners:** Confederación Hidrográfica del Tajo (CHT), 2. Agencia Portuguesa do Ambiente (Portuguese Agency of the Environment –APAMBIENTE-).

**Observers:** Sub-Directorate on Planning and Sustainable Use of Water (Spanish Ministry of Agriculture, Food and Environment), Confederación Hidrográfica del Júcar (CHJ) and United Nations Office to support the International Decade for Action 'Water for Life' 2005-2015.

**Objectives:** PROTAGUS aims at obtaining and assessing socio-economic, environmental and climatic data, and develop updated water balances according to water availability and existing demands in the Tajo River Basin. The project will:

- **Develop** water resources balance in the Tagus river basin following a methodology consistent with the building of the European water resource balances within the System of Economic and Environmental Accounts for Water (SEEAW – <http://unstats.un.org/unsd/envaccounting/seeaw.asp>) framework at the monthly resolution under the "European catchments and River network system" (ECRINS – <http://eea.eionet.europa.eu/Public/irc/eionet-circle/ecrins/home>) reference system.
- **Test** innovative solutions for gathering and integrating the data needed for the water resources balance (e.g. river discharge monitoring).
- **Test** at transboundary scale the integration of water resources balance in the river basin management planning.

- 
- **Identify** management, technological and economic measures applied in the selected river basin(s), which encourage optimal water management and avoid unsustainable water use.
  - **Propose**, based on the identified water saving potentials in the selected river basin, sector specific and river basin specific water efficiency targets, water re-use target and targets related to ecosystems and their services, land-use and adaptation to climate change allowing to preserve and/or restore the natural water balance.

**Expected results:**

- **Relevant water balance tables for the Tagus River Basin.**
- **Innovative solutions to data gathering and integration.**
- **Assessment of how the River Basin Authorities have integrated quantitative water management issues in the preparation of the 2015 River Basin Management Plans.**

**Background:** EVREN already led and developed a similar project for the Júcar River Basin within the call of 2011-2012, called Halt-Júcar-Des<sup>1</sup>.

**Proposed activities:**

**1- Establishment of Context and background**

- a. Identification of main water related issues in the Tajo River Basin.
- b. Assessment of desertification/water scarcity aspects.
- c. Summary of climate change scenarios and previsions.
- d. Assessment of specific measures in the Draft River Basin Management Plan and water economic aspects (and preliminary works of 2015 RBMPs).

**2- Data gathering process**

- a. Assessment of available data for the basin (Spanish and Portuguese side).
- b. Identification of data gaps.
- c. Establishment of approach for determining scales (selection of management scale, criteria for data available at different scales).
- d. Fill-in of gaps through Aquatool and other models/tools.

**3- Build-up of water accounts**

- a. Improvement of data base.
- b. Share of knowledge on water balances and SEEAW with CHT and Portuguese officials.

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<sup>1</sup> <http://www.evren.es/halt-jucar/>; <http://www.emwis.org/initiatives/desert-jucar>

- 
- c. Development/completion of tables.
  - d. Reinforce and develop previous experience: share results with the CH Júcar, transmit possible improvements for their tables, exchange of ideas to improve exercise.
  - e. Assessment of socio-economic aspects
  - f. Propose targets and make recommendations (water savings potentials, reuse, "green measures" ...)

#### **4- Training, dissemination and meetings**

- a. Participation in coordination meetings and workshops (EC).
- b. Use of existing platforms and tools to disseminate results (e-bulletins, webs, international events).
- c. Organisation of events: 1-2 dissemination events (Spain and/or Portugal), internal meetings, coordination meetings (with other pilot projects) and also the participation of international events in which dissemination of the project and its progresses has been foreseen.

#### **Role of partners:**

- **EVREN:** coordinate, manage and distribute funds, gather data, execute works and disseminate results (approximate dedication 60%).
- **CHT/Portuguese officials:** provide data, review obtained water balances tables, and participate in coordination meetings (approximate dedication 20% in total).



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#### **Annex 4. Informative Brochure**

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- **Entidad coordinadora:**  
EVREN, Evaluación de Recursos Naturales, S.A.
- **Entidades participantes:**  
Confederación Hidrográfica del Tajo (CHT),  
Agência Portuguesa do Ambiente.
- **Duración:** 12 meses (2014)
- **Objetivos:**  
Este proyecto tiene por objeto emplear la metodología de Naciones Unidas para elaborar cuentas económicas y ambientales del agua en las demarcaciones hidrográficas de la cuenca internacional del río Tajo.  
  
Los objetivos específicos incluyen:
  - Recopilar y analizar datos (caudales, precipitación, evapotranspiración, aspectos climáticos, niveles de acuíferos, demandas, etc.), y adaptarlos al sistema de Contabilidad de Gestión Ambiental de Naciones Unidas enfocado al agua (SEEA-W).
  - Proponer una metodología para el tratamiento de datos y su integración en los sistemas mencionados.
  - Obtener balances hídricos actualizados y detectar riesgos de desertificación en la cuenca.
  - Evaluar los resultados y transmitirlos a gestores y partes interesadas.
  - Establecer una serie de recomendaciones para el ahorro de agua y establecer objetivos factibles de gestión.
  - Difundir y transferir los resultados.

► **Acciones a realizar:**

El trabajo se divide en 4 actividades principales:

1. Antecedentes y contexto.
2. Recopilación de datos
3. Aplicación de la metodología **SEEA-W** de Naciones Unidas con los datos recopilados.
4. Formación, difusión de resultados y reuniones.

► **Resultados esperados:**

Mediante este proyecto, se pretende compartir con el sector del agua europeo, la metodología necesaria para realizar balances hídricos detallados que contribuyan a obtener un mejor conocimiento de la situación de las demarcaciones hidrográficas europeas. Asimismo, la propia obtención de las cuentas del agua en las demarcación hidrográficas de España y Portugal de la cuenca internacional del Río Tajo, permitirá realizar un diagnóstico e identificación de medidas de ahorro y gestión del agua contra la desertificación en la propia cuenca, mediante el uso sostenible del agua en armonía con el medio ambiente. Este ejercicio piloto contribuye al proceso político "Blueprint, un plan de acción para salvaguardar las aguas europeas".

► **Datos de contacto del coordinador:**

Ana Nieto, [anieto@evren.es](mailto:anieto@evren.es), +34 963959496

► **Enlaces:**

[www.evren.es](http://www.evren.es)  
<http://www.chtajo.es>  
<http://www.apambiente.pt/>

# PROYECTO PILOTO SOBRE BALANCES DE AGUA EN LA CUENCA DEL RÍO TAJO (PROTAGUS)

(Proyecto sobre el desarrollo de las actividades de prevención para frenar la desertificación en Europa)



► **Coordinating entity:**  
EVREN, Evaluación de Recursos Naturales, S.A.

► **Participating entities:**  
Confederación Hidrográfica del Tajo (CHT),  
Agência Portuguesa do Ambiente.

► **Duration of the action:** 12 months (2014)

► **Objectives:**  
This project aims at applying the United Nations methodology to develop water environmental and economic accounts in the river basin districts of the Tagus River international basin.

Specific objectives include:

- Compile and assess data (flows, precipitation, evapotranspiration, climatic aspects, groundwater levels, demands etc.) and adapt them to the UN System of Environmental-Economic Accounting for Water (SEEA-W).
- Propose a methodology for the management of data and their integration in the aforementioned systems.
- Obtain updated water accounts and identify desertification risks in the basin.
- Assess results and transmit them to managers and stakeholders.
- Establish a series of recommendations for feasible water savings options and management measures targets.
- Transfer and disseminate results.

► **Actions to be developed:**

The works of this action are divided in 4 main activities:

1. Establishment of background and context.
2. Collection of data.
3. Use of the United Nations SEEA-W methodology with compiled data.
4. Training, dissemination and meetings.

► **Expected results:**

Through this action it is intended to share with the European water community the required methodology to develop detailed water accounts that can contribute to obtain a better knowledge on the European river basins status. In addition, obtaining water accounts in the river basin districts of Spain and Portugal in the Tagus River international basin, will allow the development of an assessment and identification of water saving and management measures to halt desertification in the basin, through a sustainable water use in harmony with the environment. This pilot project will in turn contribute to the political process "A Blueprint to safeguard Europe's Waters".

► **Coordinator contact details:**

Ana Nieto, [anieto@evren.es](mailto:anieto@evren.es), +34 963959496

► **Links:**

- [www.evren.es](http://www.evren.es)
- <http://www.chtajo.es>
- <http://www.apambiente.pt/>

# PILOT PROJECT ON WATER BALANCES IN THE TAGUS RIVER BASIN (PROTAGUS)

Preparatory Action on development of prevention activities to halt desertification in Europe





GOBIERNO  
DE ESPAÑA

MINISTERIO  
DE AGRICULTURA, ALIMENTACIÓN  
Y MEDIO AMBIENTE

CONFEDERACIÓN  
HIDROGRÁFICA  
DEL TAJO



## **Annex 5. Detailed works on Task 2**

## Annex 5 Detailed works on Task 2. Data harvesting

With the start of the project we began to investigate the sources of information necessary to accomplish the objectives of filling the SEEA-Water tables.

Firstly, we searched for public sources of data in repositories from Spain, Portugal and Europe.

Furthermore, we requested our partners the data for which we suspect they could have a better or more complete version than the public available sources (in annex 6 there is a copy of the communication request). Up to date, we have not received any data (we expect these will come soon).

The harvesting was done in two main phases. We made an initial search of information systems in February 2014. After this initial search, we tried again on May 2014 focusing on the lack of information. After these two phases we still have gaps of information mainly in the Portuguese area of the Tagus basin. The Portuguese government is doing organisational changes and information that was previously available is no longer in current portals.

### **SPAIN**

#### ➤ *CONFEDERACIÓN HIDROGRÁFICA DEL TATO (CHT)*

We have requested data not easily available to the public (see annex 6 for details). Mainly raw data that the CHT has used to develop the River Basin Management Plan.

#### ➤ *CEDEX*

From the [Annual gauge station report site](#) we collected information of flows in rivers and channels, and capacity in reservoirs.

#### ➤ *MINISTRY OF AGRICULTURE, FOOD AND ENVIRONMENT*

From the [Integrated Information System of Water](#) (Sistema Integrado de Información del Agua - SIA) of the Ministry of Agriculture, Food and Environment (Ministerio de Agricultura, Alimentación y Medio Ambiente - MAGRAMA) we extracted information on hydrological data (SIMPA model of CEDEX) with monthly rasters of 1km of cell size of the variables *Potential Evapotranspiration, Actual Evapotranspiration, Precipitation, Temperature, Soil Humidity, Surface Runoff, Infiltration, Groundwater Runoff and Total Runoff*.

Furthermore, we extracted water related data, and administrative delimitations including geographical coverages for:

- Regions
- Basin districts
- Urban areas
- Sub-basins
- Waste water treatment plants

- Delimitation of lakes
- Groundwater bodies
- Surface water bodies
- Dams
- Rivers
- Water Management Systems (WMS) (Sistemas de Explotación)

In this website, there are several additional datasets and coverages but we do not intend to use them for the time being.

➤ *INE*

In the [Statistical National Institute](#) (Instituto Nacional de Estadística - INE) web site, we found the socio-economical data. The main problem is the different used scale between this information (by municipalities or region) and the areas in which we need to aggregate the water balances (WMS). In the case of municipal information, information is rather simple to sum up. The problem comes when the intersections of the regions with the WMS are very different. In these cases, we will overlap the information extracting an estimation of the relevant quantities.

## **PORTUGAL**

➤ *AGÊNCIA PORTUGUESA DO AMBIENTE*

[APAmbiente](#) has several sites of Environmental Information, but they are still in development, or do not provide useful information. Others sites referred inside of APAmbiente do not provide the actual information, only citing the indicator but not offering the data.

➤ *SISTEMA NACIONAL DE INFORMAÇÃO DE RECUSOS HÍDRICOS*

In the [Sistema Nacional de Informação de Recursos Hídricos](#) we accessed the hydrologic information in the Portuguese side of the Tagus basin. Some series are interrupted at 2008, and others at 2012/13 due to budgetary cuts. Some of them restart on 2014, but not all.

The information in this web site is time series of daily and monthly data of the following variables (not all stations have all the variables, and not all stations have completed temporal series, or daily or monthly information): Temperature, Precipitation, Wind velocity, Air humidity, Solar radiation, Cloudy level, Evapotranspiration, Gauge stations (flow and level in reservoirs), Piezometer level, Water quality (surface and groundwater).

➤ *INSTITUTO NACIONAL DE ESTADÍSTICA*

We collected economical and social data from the [INE](#). This information includes demographical, agriculture, forestry, water uses, water treatment, etc., at various scales, usually at municipal scale. These data are usually aggregated temporally and spatially. We will need to disaggregate them to process and filling in data tables.



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#### *SOME ADDITIONAL CONSULTED WEBSITES THAT ARE NOT USEFUL*

The following web sites have been consulted but have not provided useful information:

- [Portal de Metadatos](#). No results obtained to queries.
- [Portal Indicadores de Desenvolvimento Sustentável](#). The page shows the list of indicators but no data related to them.
- [Visor de informacion Ambiental](#). It has no information related to water accounts.
- [Portal da Água](#). It redirects the user to other National and Regional information systems. In the Regionals systems there is only information of the Azores archipelago.

## **EUROPE**

### ➤ *EUROPEAN ENVIRONMENT AGENCY AND WISE*

Urban Waste Water Treatment, from the EEA's waterbase, includes the official data sent by Member States and we understand are the most curated data we can obtain. It is easier to obtain some data from the collected repositories from the EC than from the Member States, and the Urban Waste Water Treatment data section is an example, as for instance for Non-point source pollutants (e.g. nitrates in agriculture).

### ➤ *EUROSTAT*

We do not intend to use [Eurostat](#) as main data repository. We will just use it in case of the necessity of contrasting information from the Spanish INE or Portuguese INE.

### ➤ *OTHER SOURCES*

We plan to consult other sources (as technical studies or university research reports) when we will be checking the validity of results (see [next section](#)). We do not want to start tasks being already influenced by other elaborated research studies. We are sure at this point, that we will have to consult, for instance, Urban Runoff studies of pollutants.

### ➤ *SOME FORESEEN PROBLEMS*

For some variables we expect to find no information unless it will come from models or studies. For instance, for hydrological variables: Returns; Groundwater Flows; into, out and between (there are some studies to check) elements; Outflows to the sea; some outflows to other territories -maybe in the same RBD- (some could be estimated by some upstream gauge station); Abstractions for own use; Groundwater (only abstraction from the largest wells are metered); Soil water (it can be estimated from actual evapotranspiration and soil use); losses in distributing water; Flows between economic units (especially when the same company has the whole abstraction, supply, sewerage, waste water reuse and discharge).



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AGÊNCIA  
PORTUGUESA  
DO AMBIENTE

## **Annex 6. Meeting documents**

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6.1 Madrid Kick off meeting documents

6.2 Brussels kick off meeting documents

6.3 Information request

6.4 List of stakeholders



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## **PILOT PROJECT ON WATER BALANCES IN THE TAGUS RIVER BASIN**

### **“PROTAGUS”**

#### **Convocatoria “Kick-off meeting”**

28 de enero de 2014

Confederación Hidrográfica del Tajo

Av. de Portugal 81, 28071 Madrid

[https://maps.google.es/maps?f=q&source=s\\_q&hl=es&geocode=&q=avenida+de+portugal+81,28011+madrid](https://maps.google.es/maps?f=q&source=s_q&hl=es&geocode=&q=avenida+de+portugal+81,28011+madrid)

#### **Invitados:**

- Coordinador: EVREN
- Partners: CHT, ARH Tejo Y United Nations Office.
- Observadores: Subdirección General de Planificación y Uso Sostenible del Agua (DGA, MAGRAMA) y Oficina de Planificación Hidrológica del Júcar (CHJ).

#### **Orden del día:**

- a) Asuntos administrativos
- b) Descripción del proyecto
- c) Cronograma tentativo
- d) Organización de tareas
- e) Ruegos y preguntas



Pilot project on water balances in the Tagus River Basin

# PROTAGUS

Kick-off meeting  
28 de enero 2014  
Confederación Hidrográfica del Tajo

[www.evren.es](http://www.evren.es)

1

**EVREN:**

Empresa consultora fundada en el año 1988.

Áreas de trabajo:

- Recursos hídricos
- Gestión de residuos
- Evaluación y control ambiental
- Paisaje
- Planificación territorial y urbanística

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2

**ANTECEDENTES:**

**Halting Desertification in the Jucar River Basin (HALT-JUCAR-DES)**

Coordinador:  
➤ EVREN, S.A

Socios:  
➤ Sistema Euromediterráneo de información sobre el agua (SEMIDE)  
➤ Confederación Hidrográfica del Júcar (CHJ)

Duración: 15 meses

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3

**Halting Desertification in the Jucar River Basin (HALT-JUCAR-DES)**

**OBJETIVOS:**

- Obtención de unas cuentas del agua detalladas que permitieran evaluar los riesgos de desertificación existentes.
- Incorporar datos socio-económicos, ambientales y climáticos en los balances hídricos.
- Recopilación de datos y adaptación a los sistemas ECRINS y SCAE.
- Recomendaciones para ahorro del agua y medidas de gestión.
- Trasferir resultados a la UE y países mediterráneos.

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Pilot project on water balances in the Tagus River Basin

# PROTAGUS

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AGÊNCIA PORTUGUESA DO AMBIENTE



**COORDINADOR:**

- EVREN, S.A

**SOCIOS:**

- Confederación Hidrográfica del Tajo (CHT)
- Agencia Portuguesa do Ambiente, I.P
- Oficina del Agua de Naciones Unidas de Apoyo al Decenio Internacional para la Acción “El Agua, fuente de vida”

**OBSERVADORES**

- Subdirección General de Planificación y Uso Sostenible del Agua (DGA, MAGRAMA)
- Oficina de Planificación Hidrológica del Júcar (CHJ)

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**DURACIÓN:**

- 12 meses
- Inicio: 1 de enero de 2014

**PRESUPUESTO:**

- Total: 122.087 €
- Subvención: 91.565 €

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**REUNIONES PROTAGUS:**

- Kick-off meeting: 28 de enero de 2014. Madrid.
  - Objetivos del proyecto y resultados esperados
- Mid-term meeting: Madrid/Lisboa
  - Analizar la marcha del proyecto. Dificultades y soluciones
- Final meeting: Madrid
  - Resultados del proyecto.
- National dissemination:
  - Difundir el progreso del proyecto. Web de seguimiento del proyecto.

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**OTRAS REUNIONES:**

- International Events
- Coordination meetings
  - Kick off meeting of the 2013 Halting Desertification in Europe Pilot Projects.  
Miércoles 5 de febrero. DG Medioambiente. Bruselas
  - Follow-up meeting of the 2013 Halting Desertification in Europe Pilot Projects.  
Fecha por determinar. DG Medioambiente. Bruselas

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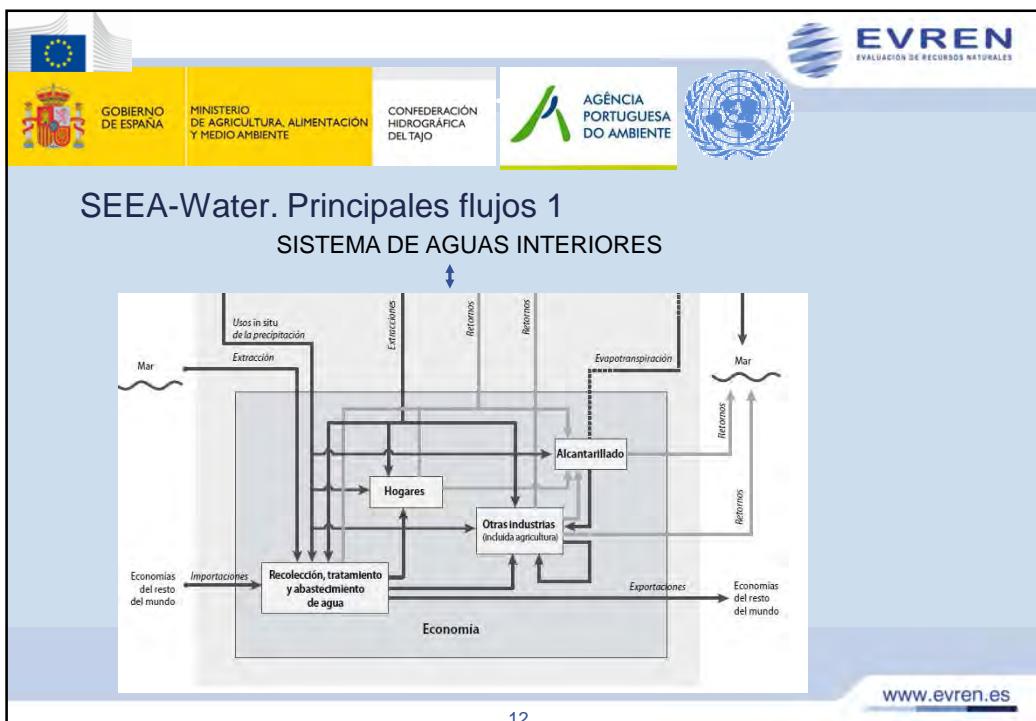
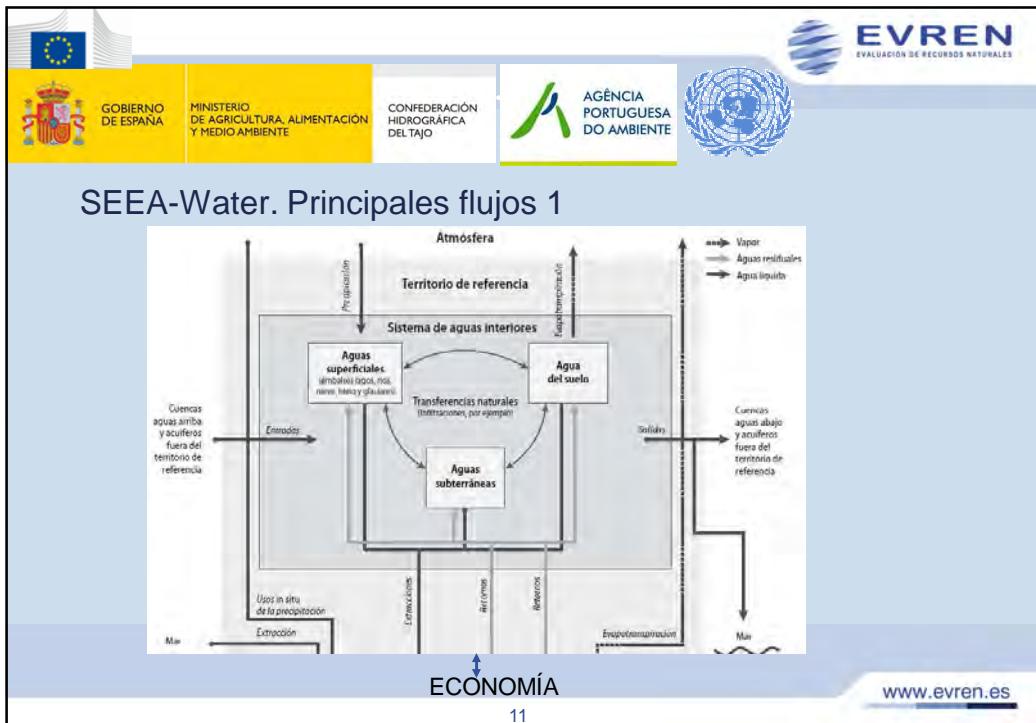
9

**SEEA-Water. Sistema de Contabilidad Ambiental y Económica para el Agua**

- Marco conceptual para organizar de manera coherente y sistemática la información sobre cuestiones hidrológicas y económicas
- Tablas estándar con información sobre cuestiones hidrológicas y económicas; tablas complementarias sobre aspectos sociales
- Se vinculan directamente datos sobre los recursos hídricos, con la contabilidad económica, gracias a una estructura compartida y un conjunto de definiciones y clasificaciones en común (*instrumento para integrar los análisis ambientales y económicos y superar la tendencia a fragmentar los temas asignándolos a distintas disciplinas*)

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**SEEA-Water. ¿Por qué lo quiere la Comisión Europea?**

- Incorporación de la cantidad en las próximas revisiones de los Planes (Blueprint)
- Posible modificación de la Directiva Marco de Aguas e inclusión de aspectos ligados con escasez de agua y sequías
- Sistema de contabilidad común para todos los países de la Unión

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**SEEA-Water. ¿Por qué es interesante que los pilotos se hagan en España y que se lidere el grupo europeo de balances?**

- Se tiene experiencia
- Se podrá demostrar que se hace un uso eficiente del agua
- Que son necesarias medidas que anteriormente no se entendían o comprendían muy bien en el norte de Europa
- Que los costes pueden ser mucho mayores que en otros países

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**SEEA-Water PROTAGUS. Requisitos**

- Escala espacial: sistema de explotación (mínimo)
- Escala temporal: mensual
- Marco temporal: últimos diez años de los que se disponga información
- Unidades de trabajo dentro de un sistema (elementos susceptibles de almacenar agua):
  - Ríos, lagos, embalses, nieve acumulada, aguas subterráneas y suelo

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**SEEA-Water PROTAGUS. Desarrollo**

- Recopilación de información y adaptación a base de datos SEEA-Water
  - Principales orígenes de la información:
    - Plan Hidrológico (Inventario de recursos, balances, demandas, retornos, cargas contaminantes...)
    - SIMPA (para las abstracciones from agriculture+usos del suelo o ESYRCE)
    - ESYRCE (Encuesta sobre superficies y rendimientos de cultivos)
    - INE (Instituto Nacional de Estadística Español)
- Elaboración de balances a partir de base de datos SEEA-Water
- Análisis de resultados y comparación con resultados del Plan Hidrológico

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## SEEA-Water PROTAGUS. Dificultades 1

- Mensualización de variables anuales o interanuales
- Asociación de datos espaciales a escala distinta del sistema de explotación (los datos económicos se encuentran en escalas más amplias, aunque la mayoría ya se deben haber considerado para el PHC). (SEEA-Water está pensado a escala país).
- Asociación de valores a elementos de volumen (retornos a ríos o aguas subterráneas, flujos entre los distintos elementos de volumen, extracciones desde embalses o desde ríos, extracciones para uso hidroeléctrico...)
- Por determinar a requisito de la Comisión Europea:
  - Ampliación de la escala espacial a territorios menores que los sistemas de explotación

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## SEEA-Water PROTAGUS. Dificultades 2

- Gestión de la incertidumbre asociada a los datos y expresión de la misma en los resultados (rangos/horquillas/desviaciones estándar)
- Datos de partida pueden tener una incertidumbre en algunas variables del orden de magnitud aunque pueden estar acotadas
- Por determinar a requisito de la Comisión Europea:
  - Ampliación de la escala espacial a territorios menores que los sistemas de explotación

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**CONTACTO:**

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## PILOT PROJECT ON WATER BALANCES IN THE TAGUS RIVER BASIN “PROTAGUS”

### Acta de la “Kick-off meeting”

28 de enero de 2014

Confederación Hidrográfica del Tajo

Av. de Portugal 81, 28071 Madrid

[https://maps.google.es/maps?f=q&source=s\\_q&hl=es&geocode=&q=avenida+de+portugal+81\\_28011+madrid](https://maps.google.es/maps?f=q&source=s_q&hl=es&geocode=&q=avenida+de+portugal+81_28011+madrid)

#### Asistentes:

- EVREN:
  - Vicente Ramírez Perea
  - Ana Nieto Arias
- Confederación Hidrográfica del Tajo CHT:
  - Presidente: Miguel Antolín Martínez
  - Comisario: Ignacio Ballarín Iribarren
  - Jefe de la OPH: Francisco Aleza Enciso
  - Jefe de Área de Comisaría: Gabino Liébana
  - Jefe de Área de la Oficina de Planificación: David Peracho
  - Asistencia Técnica Presidencia: Lucia Rodríguez Montañez

#### Orden del día:

- a) Temas administrativos

Los temas administrativos tratados fueron los siguientes:



- Participantes del proyecto: **Coordinador** (EVREN), **socios** (CHT, Agencia Portuguesa do Ambiente, Oficina del Agua de Naciones Unidas), **observadores** (SGPUSA (MAGRAMA), Oficina Planificación de la CHJ).
- Duración: 12 meses, con comienzo el 1 de enero de 2014.
- Presupuesto: 122.087 € (subvención 91.565 €)

#### b) Descripción del proyecto

Se explicó en qué consistía el proyecto, cuáles eran sus objetivos y resultados esperados:

- Realizar balances hídricos teniendo en cuenta también variables económicas, ambientales e incluso sociales. Se realiza a través de una metodología de Naciones Unidas llamada SEEA-Water (Sistema de contabilidad ambiental y económica para el agua) con el objetivo de que todos los países de la Unión Europea usen la misma.
- Escala espacial: sistema de explotación (como mínimo)
- Escala temporal: mensual
- Marco temporal: últimos diez años con datos completos.
- Unidades de trabajo dentro de un sistema (elementos susceptibles de almacenar agua): ríos, lagos, embalses, nieve acumulada, aguas subterráneas y suelo.

#### c) Cronograma tentativo

Se explicaron las distintas fases del proyecto:

- Recopilación de información y adaptación a base de datos SEEA-Water
- Elaboración de balances a partir de base de datos SEEA-Water
- Análisis de resultados y comparación con resultados del Plan Hidrológico

No se ha podido concretar un calendario preciso por no estar presentes los representantes de la Agencia Portuguesa do Ambiente ni de la Oficina del Agua de Naciones Unidas y no conocer por lo tanto sus disponibilidades. Se concretará más adelante tras la reunión del 5 de febrero en Bruselas y tras los contactos mantenidos con los socios ausentes en esta reunión.



Se explicaron las reuniones previstas:

#### **Reuniones exclusivas del proyecto:**

- Kick-off meeting: 28 de enero de 2014. Madrid.
  - Objetivos del proyecto y resultados esperados
- Mid-term meeting: Madrid/Lisboa
  - Analizar la marcha del proyecto. Dificultades y soluciones
- Final meeting: Madrid
  - Resultados del proyecto.
- National dissemination:
  - Difundir el progreso del proyecto. Web de seguimiento del proyecto.
- Reunión con la Comisión:
  - Previsible reunión para trabajar sobre este proyecto particular con la Comisión Europea.

#### **Otras reuniones**

- International Events
- Coordination meetings
  - Kick off meeting of the 2013 Halting Desertification in Europe Pilot Projects.  
Miércoles 5 de febrero. DG Medioambiente. Bruselas
  - Follow-up meeting of the 2013 Halting Desertification in Europe Pilot Projects.  
Fecha por determinar. DG Medioambiente. Bruselas

d) Organización de tareas



Se analizó junto con los técnicos de la CHT los datos que iban a estar fácilmente disponibles y aquellos cuya consecución iba a ser complicada. Así como cualquier otra dificultad que pudiera aparecer durante el desarrollo del proyecto con el fin de ir buscando soluciones.

En esta primera reunión no se ha concretado el alcance detallado de los datos y de los trabajos a la espera de las instrucciones que se recibirán por parte de la CE en la reunión del próximo 5 de febrero en Bruselas.

e) Ruegos y preguntas

Se les pide a los técnicos de la CHT los datos necesarios para ir empezando a trabajar y se informa de que también van a ser solicitados a la parte portuguesa de la Demarcación del Tajo.

Se concluye que a la reunión de Bruselas del día 5 de febrero únicamente irá personal de EVREN, a falta de la confirmación de la Agencia Portuguesa do Ambiente.



EUROPEAN COMMISSION  
DIRECTORATE-GENERAL  
ENVIRONMENT  
Directorate C - Quality of Life, Water & Air  
**ENV.C.1 - Water**

**KICK-OFF MEETING OF THE 2013 HALTING DESERTIFICATION IN EUROPE PILOT PROJECTS  
DG ENVIRONMENT, ROOM C, BEAULIEU 5, BRUSSELS**

**DRAFT AGENDA**

**WEDNESDAY, 5 FEBRUARY 2014 (FROM 10:00 TO 16:00)**

<b>Timing</b>	<b>Agenda items</b>	<b>Speakers</b>
10:00 – 10:10	<b>Welcome and introduction</b> <ul style="list-style-type: none"><li>• Tour de table</li></ul>	DG ENV C.1
10:10 – 10:40	<b>Presentation of the work on water accounts at EU level, including the work of the European Environment Agency (EEA) and JRC</b>	DG ENV C.1 EEA (tbc) JRC (tbc)
10:40 – 11:00	<b>Comments and discussion</b>	
11:00 – 11:30	<b>Lessons learnt from the 2011 pilot projects</b> <ul style="list-style-type: none"><li>• System of Economic and Environmental Accounts for Water in Guadiana River Basin (GuaSEEAW)</li><li>• Halting desertification in the Jucar River Basin (Halt-Jucar-Des)</li><li>• Assessment of water balances and optimization based target setting across EU River Basins (ABOT)</li></ul>	<ul style="list-style-type: none"><li>• SM Consultores S.L. (ES)</li><li>• EVREN (ES)</li><li>• Research Institute for Geo-Hydrological protection, Natural Research Council (IT) (tbc)</li></ul>
11:30 – 12:00	<b>Comments and discussion</b>	
12:00 – 13:00	<i>Lunch break</i>	
13:00 – 14:00	<b>Presentations of the 2013 pilot projects</b> <ul style="list-style-type: none"><li>• New Developments in Water Accounts Implementation in Guadiana River Basin</li><li>• Duero River Basin: Water resources, water accounts and target sustainability indices</li><li>• System of Water Accounting in the Guadalquivir River Basin</li><li>• Pilot Arno Water accounts (PAWA)</li></ul>	<ul style="list-style-type: none"><li>• GEODIM</li><li>• Universidad Politécnica de Madrid (UPM)</li><li>• Universidad de Córdoba</li><li>• ISPRA</li></ul>
14:00 – 14:30	<b>Comments and discussion</b>	
14:30 – 14:45	<i>Coffee break</i>	
14:45 – 15:30	<b>Presentations of the 2013 pilot projects</b> <ul style="list-style-type: none"><li>• Pilot project on water balances in the Tagus River Basin (PROTAGUS)</li><li>• Accounting System for the Segura River and Transfers (ASSET)</li><li>• Water accounting in a multi-catchment district (WAMCD)</li></ul>	<ul style="list-style-type: none"><li>• EVREN</li><li>• UPCT</li><li>• INTECSA</li></ul>
15:30 – 16:00	<b>Comments and discussion</b>	
16:00 – 16:15	<b>Presentation of reporting requirements (financial, technical, timesheets)</b>	DG ENV SRD2
16:15	<b>Conclusions and Next steps</b>	



Works in Loriguilla Dam, [www.chj.es](http://www.chj.es)

**Kick-off Meeting of the 2013 Halting Desertification in Europe Pilot Projects**

**Results of the 2011 project: Halting Desertification in the Júcar River Basin (HALT-JÚCAR-DES)**

Brussels, 4 February 2014  
Vicente Ramírez & Elisa Vargas, EVREN

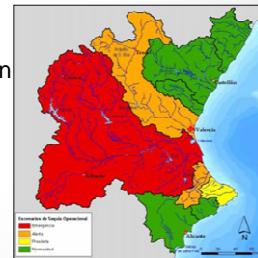
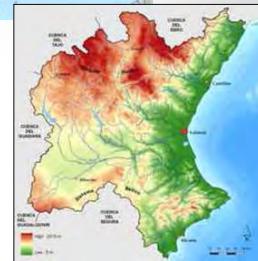
## Introduction to the project

- Three partners were involved: EVREN (SME), EMWIS (International network), Júcar River Basin Authority (Gov.).
- Scale: Júcar River basin District, in the east of Spain (pilot RBD in the first stage of the WFD implementation).
- Aim: obtain and assess environmental and climatic data, use systems/models and provide recommendations to save water resources.
  - Water Accounts
- Transfer results: dissemination to EU and non-EU countries through EMWIS.
- Duration: Dec 2011-March 2013

Júcar RBD

## The Jucar RBD

- Surface: 42.851km<sup>2</sup>. Population (2009): 5,1 million.
- Mediterranean climate (average temp. 14-16°C; average annual rainfall 500 mm).
- High season variability.
- Relevant groundwater resources.
- Water scarcity & droughts.
  - Drought management plan since 2007.
- Desertification: overexploitation of aquifers and salinization of soils.
- Relevant demographic and touristic pressures.
- A river basin facing most of the water resources challenges!



## Developed Tasks

1. Establishment of background and context.
2. Collection of data and contacts with administrations and other partners.
  - Data delivery feasibility, improvement of datasets. Collection from: Júcar RBA, Ministry of Agriculture, Food and Environment (MAGRAMA), National Statistics Institute (INE), National Meteorological Agency (AEMET), National Water System (SIA), CEDEX, IGN, ECRINS (EEA), EIONET, EUROSTAT...
3. Application of method by SEEAW and ECRINS specifications.
  - Disaggregation, detailed water resources balance, identification of measures. Preliminary water accounts.
4. Assessment and recommendations.
  - For data gathering, future projects, river basin authorities, implementation of water accounts tables...
5. Meetings and deliverables.
6. Dissemination and capacity building.
  - Web-site section EVREN, EMWIS e-bulletin and website, brochure, attended international events, workshop with the participation of non-EU countries.

## Results

- Several technical **reports**: background report, 3 follow-up reports, recommendations report, FEC revision, Precipitation data & scale zones report, final report...
- Meetings results.
- Data feasibility table.
- Web-sites sections.
- **Water accounts SQL Data base.**
- **Water accounts** (balances) for the series 2001-2010, per month and at sub-basin scale, also as Excel pivot table. SEEA-Water tables VI.1, VI.2.
- Maps and graphs to represent gathered data (better way for presenting results to the public).

Variable	Element					
	1311 Reservoir	1312 Lakes	1313 Rivers	132 Groundwater	133 Soil	Total
StateInitial	942	0	1 412	1 840	5 189	9 383
ReturnHydropower			674			674
ReturnIrrigation			28	63		91
ReturnUrbanSupply			44			44
Precipitation	4	0	6		2 047	2 057
FromArtificialReservoirs			140			140
FromGW			202			202
FromRivers	128			53		181
FromSoilWater			44	159		203
Evapotranspiration	-4	0	-6		-1 452	-1 463
AbsHydropower			-674			-674
AbsIrrigation			-131	-155		-286
AbsRainFedAgr					-460	-460
AbsUrbanSupply			-3	-56		-59
ToArtificialReservoirs			-128			-128
ToGW			-53		-159	-212
ToRivers	-140			-202	-44	-386
ToSeaTotal			-122	-56		-178
OtherLosses			-17			-17
<b>Final State</b>	<b>929</b>	<b>0</b>	<b>1 417</b>	<b>1 645</b>	<b>5 121</b>	<b>9 112</b>

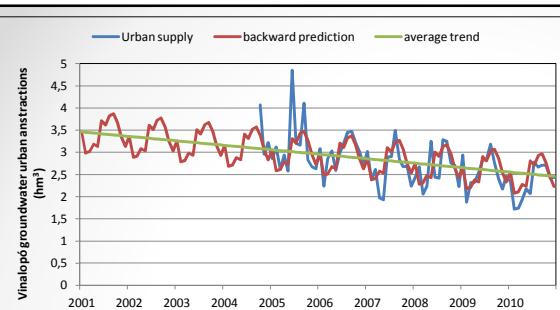
Example of water accounts table (Mijares-La Plana de Castellón WMS, year 2001)

	EA.1311 Artificial reservoirs	EA.1312 Lakes	EA.1313 Rivers	EA.133 Soil water	EA.132 Groundwater	Total
3. Precipitation	58	11	6	9 222		<b>9 297</b>
4.b. From other resources in the territory	2 566			4 574	629	<b>7 768</b>
5. Abstraction				-401	-2 536	<b>-2 937</b>
6. Evaporation/actual evapotranspiration	-53	-10	-6	-5 918		<b>-5 987</b>
7.a To other territories				-103		<b>-103</b>
7.c. To other resources in the territory	-2 645			-2 566	-629	<b>-5 839</b>
Total general	<b>-74</b>	<b>1</b>	<b>1 505</b>	<b>139</b>	<b>629</b>	<b>2 200</b>

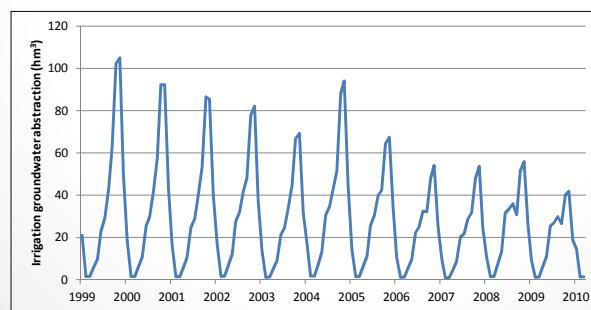
Example of water account table for the whole basin, dry year (upper table) and humid year (bottom table)

	EA.1311 Artificial reservoirs	EA.1312 Lakes	EA.1313 Rivers	EA.133 Soil water	EA.132 Groundwater	Total
3. Precipitation	87	16	9	13 716		<b>13 827</b>
4.b. From other resources in the territory	2 826			6 155	1 573	<b>10 554</b>
5. Abstraction				-509	-2 960	<b>-3 468</b>
6. Evaporation/actual evapotranspiration	-62	-12	-6	-6 906		<b>-6 986</b>
7.a To other territories				-108		<b>-108</b>
7.c. To other resources in the territory	-2 634			-2 826	-1 573	<b>-7 033</b>
Total general	<b>216</b>	<b>5</b>	<b>2 716</b>	<b>2 277</b>	<b>1 573</b>	<b>6 786</b>

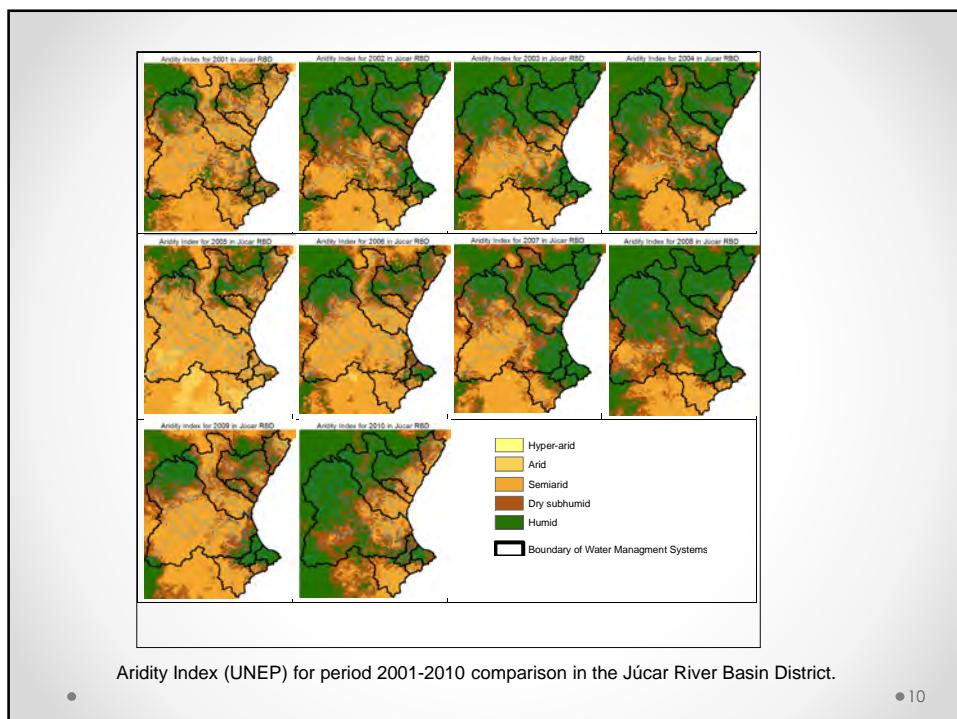
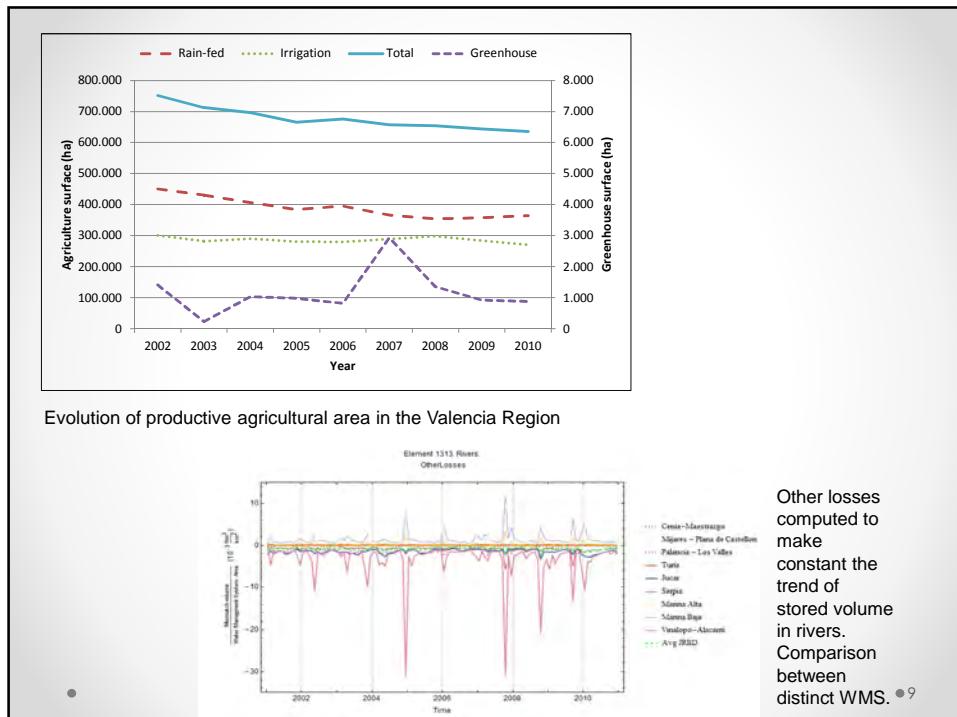
• 7

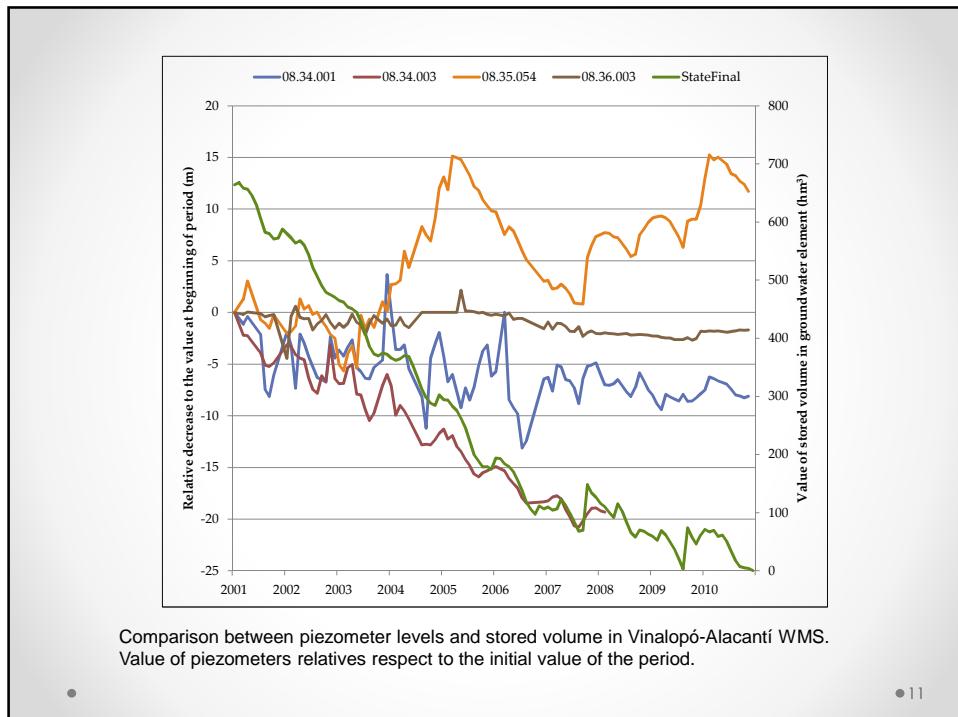


Estimated evolution of groundwater withdrawals for urban supply and backward forecast for nonexistent data at the beginning of the period.



Evolution of groundwater withdrawals for irrigation in Mancha Oriental aquifer.  
• 8





### Encountered problems / Approaches (1/2)

Júcar RBMP was still under development. (SWMI scheme under consultation, most technical works developed during the past 5 years), due to political issues in the district definition.	Officially approved or publically available data were used (most recent 2009). Also the CE provided an extension of three months.
The same parameters were sometimes monitored from various entities and sometimes with different tools (several series exist)	Cross-check of series was done, determining if there were large discrepancies.
Data robustness depending on source. Increase of uncertainty if aggregated area is smaller.	The most reliable data were used (in agreement with CHJ). Still 10% of uncertainty error in P.
"Demands" as such were not available yet (better control for surface waters than for GW).	Uses estimations and supplied volumes were incorporated (from former RBMP, Hydrological Planning Technical Guidance, surveys –AEAS, irrigation...–) and the use of SIMPA model.
Selecting the appropriate scale.	The "Sistema de explotación" (Water Management System) was used (management unit, union of sub-catchments) because it is the functional region that shares resources at the Júcar River Basin District. This scale may not work so well for larger basins.

## Encountered problems / Approaches (2/2)

No recorded data for all parameters, or not at an appropriate temporal or geographical scale.	When needed, aggregated data or models were used (e.g. "PATRICAL"; simulation model for natural regime, developed by CHJ from the SIMPA model –CEDEX-).
Water use or economic data were not available at the same geographical scale.	In the Jucar RBD the economic data were available aggregated to region, in the best case to municipalities. That is how they were used.
Matching of the political-administrative and natural boundaries of the RBD.	Adjustments/estimations were done in agreement with CHJ indications.

• •

**Thank you!**

**Questions and comments:**

[vramirez@evren.es](mailto:vramirez@evren.es)  
[evargas@evren.es](mailto:evargas@evren.es)

Casas del Río, waterwheel  
[www.chj.es](http://www.chj.es)



Pilot project on water balances in the Tagus River Basin

# PROTAGUS

Kick-off meeting  
5 February 2014  
Brussels

[www.evren.es](http://www.evren.es)

1

Introduction to the project:

**PARTNERS:**

- EVREN (SME)
- Tagus River Basin Authority (CHT)
- Agencia Portuguesa do Ambiente, I.P
- United Nations Office to Support the International Decade for Action "Water for life" 2005-2015.

**COORDINATOR:**

- EVREN, S.A

**OBSERVERS:**

- Sub-Directorate on Planning and Sustainable Use of Water (Directorate General for Water, Ministry of Agriculture, Food and Environment)
- Júcar River Basin Authority (CHJ)

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2



**EVREN:**

- Environmental Consulting Firm (SME).
- 25 years of experience.
- Offices in Spain (Madrid, Valencia) and Ecuador (Quito).
- Areas of work:
  - Water resources, international projects, agronomy and forest resources, coastal management, land planning, solid wastes, sustainable touristic developments, environmental impact assessment studies, industrial environment,
- Projects developed for the Spanish Ministry of Agriculture, Food and Environment, River basin authorities, regional governments, international entities (EC, Plan Bleu-UNEP, World Bank...).
- Beneficiary of the previous 2011 grants.
  - Halting Desertification in the Júcar River Basin (HALT-JÚCAR-DES)




[www.evren.es](http://www.evren.es)

3



**Tagus River Basin Authority:**

- Spanish river basin organisation -Ministry of Agriculture, Food and Environment. Autonomous public entity.
- Duties:
  - Elaborating the River Basin Management Plan, as well as its reviews and follow-ups
  - Administrating and controlling the hydraulic public domain
  - Administrating and controlling the uses of general interest or uses that affect more than one Spanish Autonomous Region
  - Developing water projects, constructing them and managing related infrastructures charged to the Authority own funds, and constructing other public works entrusted by the Government.
  - Developing other functions derived from agreements with Autonomous Regions, local Corporations, and other private or public entities.

[www.evren.es](http://www.evren.es)

4

**Agencia Portuguesa do Ambiente:**

- Competences:
  - Planning of water resources
  - Monitoring
  - Licensing
  - Infrastructure management
  - Surveillance
  - Information and participation

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GOVERNO DE PORTUGAL

MINISTÉRIO DO AMBIENTE,  
DESENVOLVIMENTO DO TERRITÓRIO  
E ENERGIA

Relatório de Estado do Ambiente 2013  
Acesse ao documento em [www.apambiente.pt](http://www.apambiente.pt)

www.evren.es

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**United Nations Office to Support the International Decade for Action "Water for life" 2005-2015:**

- Main objective: to promote support activities and goals under the Decade for Action "Water for life" 2005-2015.
- To promote efforts to fulfill international commitments made on water and water-related issues by 2015.
- The interest of involving the UN office in PROTAGUS is:
  - Provide a direct exchange of views with a UN entity on the System of Environmental-Economic Accounting for Water (SEEA-Water) to generate water accounts

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**SCALE of the project:**

**Tagus International River basin District**

- Surface:
  - In Spain: 55.781 km<sup>2</sup>
  - In Portugal: 25.666 km<sup>2</sup>
- Population:
  - In Spain: 7.833.089 inhabitants
  - In Portugal: 3.485.816 inhabitants
- Albufeira Agreement (1998): to improve the cooperation between the Governments of Portugal and Spain, to encourage the sustainable use of shared water courses and, maintain and improve the ecological status of shared water bodies.

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**Tagus River basin**

- Mediterranean continental climate.
- Important variability in temperature (dry summers and cold winter).
- Average precipitation: 648 mm/year.
- Total average annual contribution of 10.210hm<sup>3</sup> (1940-2006), and a reservoir storage capacity of 11.000hm<sup>3</sup> (Spanish part).
- Droughts and floods episodes are common in the basin.
- The main water demands are public supply (Madrid and Lisbon metropolitan areas), agriculture, industrial uses and other (energy plants, aquaculture and recreational uses).
- Inter-basin transfers (transfers water from the Tajo to the Segura river).

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8



**Aims of the PROTAGUS project:**

- Improve desertification knowledge on the Tagus River Basin (Midwest of Spain and central Portugal) through the development of water balances.
- Obtain and assess environmental and climatic data, use systems/models and provide recommendations to save water resources.

**Expected results:**

- Relevant water balance tables for the Tagus River Basin.
- Innovative solutions to data gathering and integration.
- Assessment of how the River Basin Authorities have integrated quantitative water management issues in the preparation of the 2015 River Basin Management Plans
- Works that might support reporting and data sharing, developing and disseminating knowledge and tools for specific areas such as economic analysis, water balances, hydro-economic modelling, etc.

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**Main activities:**

- Establishment of the context and background
- Data gathering process
- Build-up of water accounts
- Training, dissemination and meetings

**Meetings:**

- Technical meetings will be organised with partners and entities to check collected data, identify management, technological and economic measures and later review proposed recommendations and optimisation targets. In addition, dissemination activities will be organised.

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 Sistema Nacional de Informação de Recursos Hídricos



**Dados Sintetizados** **Dados de Base** **Atlas da Água** **Mediateca** **Relações Internacionais** **Inquerido**

**Redes de Monitorização**

**Destaque e novidades**

**Boletins de Recursos Hídricos**

**Últimas páginas consultadas por si**

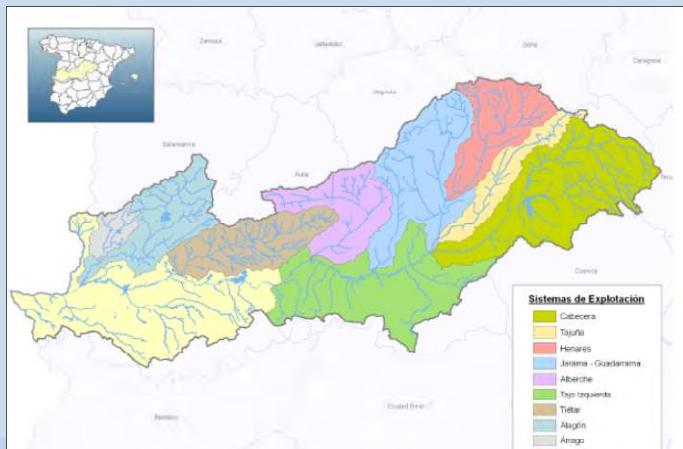
 SNIRH Litoral

Public Information Systems (Portuguese example)

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**Sistemas de Explotación**

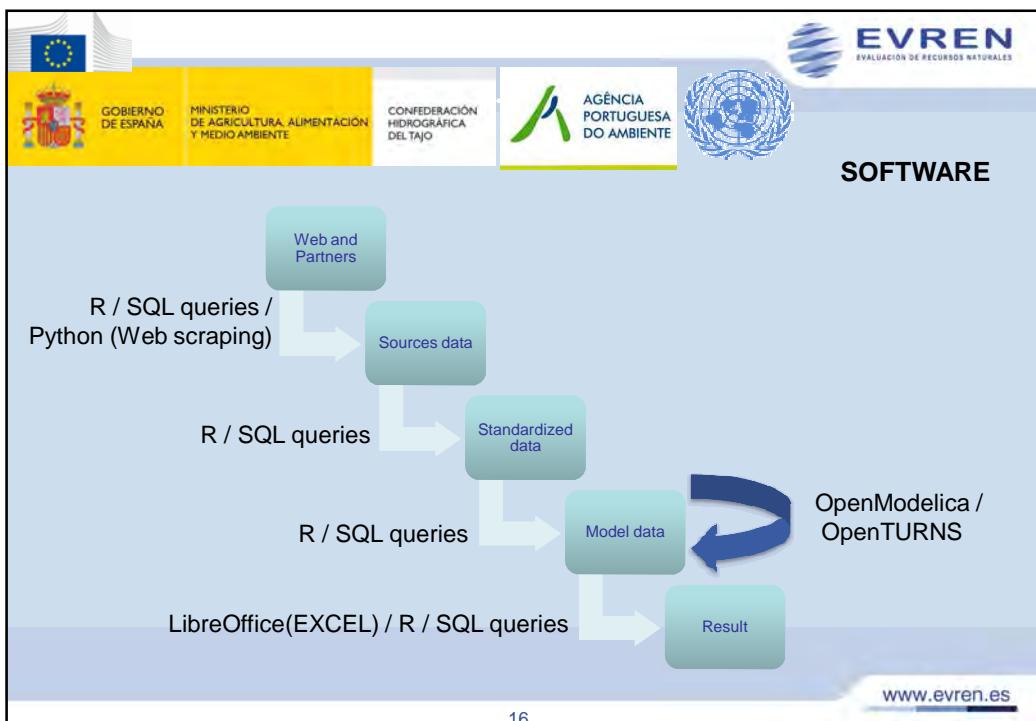
- Cabecera
- Tajula
- Hinares
- Jarama - Guadarrama
- Alberche
- Tajo Izquierdo
- Tirón
- Alegón
- Arrezo
- Bajo Tajo

Water Management Systems (Spanish territory)

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**Thank you!**

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[www.evren.es](http://www.evren.es)

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## PILOT PROJECT ON WATER BALANCES IN THE TAGUS RIVER BASIN

### “PROTAGUS”

#### Resumen del “Kick-off meeting” con la Comisión Europea

5 de febrero de 2014

Comisión Europea

Bruselas

#### Asistentes:

- PROTAGUS-EVREN:
  - Vicente Ramírez
- Comisión Europea
  - Henrriete Faergemann
  - Dagmar Kaljarikova
  - Lucia Bernal
  - Caroline Ofenhammer
- Representantes de otros proyectos (no se dispone aún al no haberla enviado la Comisión Europea)

#### Resumen:

La reunión comenzó con una breve presentación de los presentes.

Posteriormente la Comisión Europea expuso las líneas principales de los trabajos.

A continuación se presentaron tres de los proyectos realizados en la etapa anterior destacándose los problemas y dificultades encontrados.

En la segunda parte de la jornada se expusieron los nuevos proyectos, entre ellos PROTAGUS, centrándose en las particularidades y diferencias entre proyectos.



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a) Cuestiones a destacar de las intervenciones realizadas:

- a. Marco temporal y escala espacial y temporal de trabajo: La Comisión solicita que el marco temporal sea lo más amplio posible del que se dispongan buenos datos para trabajar. La escala temporal debe ser mensual, aunque sea necesario realizar estimaciones a partir de datos brutos anuales. La escala espacial no se especificó, pero no se mostró disconforme ante las propuestas de varios proyectos de trabajar a escala de Sistema de Explotación.
- b. La Comisión estudiará la propuesta de uniformizar los formatos de resultados que deben proporcionar los proyectos, así como estudiará la posibilidad de homogeneizar objetivos.
- c. La Agencia Europea de Medioambiente solicitó que cuando se usen los datos de ECRINS se especifique sobre qué versión se hace. La nueva versión revisada aún no está disponible pero lo estará a lo largo de los trabajos, por lo que podría llegar a utilizarse para contrastar información.
- d. Se comentó entre los presentes, tras la presentación de la Universidad de Cartagena, la conveniencia de que los valores relativos a los trasvases (ATS y Negratín) fuesen consensuados con los otros proyectos implicados (PROTAGUS y SIWAGuadalquivir con la Demarcación del Segura y SIWAG con la Demarcación de las cuencas mediterráneas andaluzas). Allí mismo se explicó que no sería necesario realizar ningún contraste dado que son cifras oficiales y que se publican en el Boletín Oficial del Estado y deberán corresponderse claramente.

b) Asuntos administrativos

- a. La Comisión Europea requiere que se remita un nuevo documento administrativo (Partners Agreement) en el que se especifique qué tareas realizará cada socio. En el caso particular del PROTAGUS el acuerdo sólo es necesario que sea firmado por EVREN, la Confederación Hidrográfica del Tajo y por Agencia portuguesa do Ambiente, I.P., APA,I.P. La Oficina de la Década del Agua de Zaragoza no necesita firmar este acuerdo al no estar incluida finalmente en el contrato de asignación de subvenciones.
- b. También se va a requerir que se remitan informes de seguimiento trimestrales (para lo que han proporcionado un formato común).

c) Cronograma tentativo



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- a. Casi todos los proyectos coincidieron en que la recopilación de datos se realice en los primeros seis meses y los análisis y difusiones se hagan en el segundo semestre.
- b. No se han fijado otras reuniones. Se comunicará en su momento. Se ha propuesto que como muchos proyectos son en España, que se haga en este país.
- c. Se ha sugerido también que se haga un taller de difusión conjunto de todos los proyectos aunando esfuerzos de todos ellos. Se estudiará por parte la Comisión si se recibe alguna propuesta formal por parte de algunos proyectos.

d) Documentación de la reunión:

- a. Puede encontrarse en CIRCABC en el siguiente enlace:

<https://circabc.europa.eu/w/browse/eabd73d9-293f-4cec-a09a-193121788a04>

<https://circabc.europa.eu/w/browse/eabd73d9-293f-4cec-a09a-193121788a04>

Es posible que sea necesario acceder dos veces al mismo (la segunda copiando el enlace a explorador). Para acceder desde la página principal si se tienen problemas con el enlace anterior, ir a <https://circabc.europa.eu> después “Browse categories”/”Listar categorías” a la izquierda, en el panel central bajo el título “European Comission” en “Environment” y tras este en WFD CIRCA...”. De nuevo en el menú de la izquierda en “Library”, en el centro en “F. Working Groups”, “j – WG Water Accounts” y, finalmente, en “Kick-off meeting grants on water accounts\_5 Feb 2014”.

## PROTAGUS. Tagus River Basin

### *Solicitud inicial de datos*

Para elaborar las tablas con contenido hidrológico de los capítulos V y VI del SCAE-Agua ([Sistema de Contabilidad Ambiental y Económica para el agua](#)) de Naciones Unidas, son necesarios datos adicionales no disponibles en las fuentes públicas de información consultadas (Sistema de Información del Agua del Ministerio de Agricultura, Alimentación y Medio Ambiente -SIA MAGRAMA-, Confederación Hidrográfica del Tajo -en adelante CHT-, anuario de aforos del Centro de Estudios Hidrográficos del CEDEX, European Environmental Agency).

Toda la información que se solicita se requiere para el periodo comprendido entre enero de 2001 y diciembre de 2010 ambos meses inclusive, con periodicidad mensual. En el caso de no existir la información con frecuencia mensual sería necesaria con la frecuencia más próxima existente. A su vez, si es más operativo facilitar un rango más amplio de años, en EVREN nos ocuparíamos de obtener y utilizar únicamente la parte correspondiente al estudio.

La Información cartográfica sustantiva ya ha sido recopilada de las fuentes de información mencionadas, aunque a criterio de la propia CHT podrían facilitarse coberturas geográficas de mejor calidad o rigor. En particular serían de utilidad las coberturas mensuales de las variables ráster equivalentes a las del modelo SIMPA elaboradas por CEDEX para el MAGRAMA, si se han particularizado para esa Demarcación Hidrográfica o se han obtenido por otros medios pero se han usado en la elaboración del Plan Hidrológico.

Si resulta más conveniente para la CHT facilitar tablas con más información que la solicitada (más años, más frecuencia, más campos, tablas relacionadas, etc.), en el proceso de tratamiento de los datos el equipo del proyecto PROTAGUS procedería a recortar la información para que se ajuste al periodo de estudio del proyecto.

El proyecto trata de reflejar lo realmente acontecido en la cuenca del Tajo en los años en estudio. Por ello, los datos requeridos deberían ser siempre que sea posible datos realmente medidos. En muchos casos, no existirán volúmenes realmente conocidos, como por ejemplo: detacciones de aguas subterráneas, volúmenes vertidos a cauce público por depuradoras, retornos agrícolas por infiltración o por escorrentía. En esos casos, serán necesarios los datos de los volúmenes concedidos para uso o vertido, o bien los datos estimados de los retornos por la propia CHT u otros estudios existentes. En este último caso se agradecería enormemente que se facilitase una relación de dichos estudios. Por ejemplo si se ha estudiado la estacionalidad del consumo para determinados usos o cultivos en la elaboración del Plan Hidrológico de cuenca.

En principio la información se requiere lo más desagregada posible ya que se procederá a su agrupación posterior por Sistema de Explotación en el proceso de análisis. Sin embargo, si es más sencillo o práctico para la CHT facilitar la información ya agregada por Sistema de Explotación, en el proceso de consolidación de las bases de datos utilizaríamos esta información contrastando con otras fuentes y poniendo en conocimiento de la CHT cualquier discrepancia que obtengamos en el tratamiento de los datos.

En ningún caso se precisa información de los titulares de concesiones o cualquier otra información de

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carácter personal. En el caso de que en la información recibida la hubiese, el equipo del proyecto PROTAGUS procederá a eliminarla de manera preliminar antes de proceder con otros tratamientos de datos y se compromete a no hacer uso de la información eliminada.

En todos los casos se solicita información disponible en la actualidad y que no requiera elaboración por parte de la CHT. Si existiese información en bruto para elaborar alguno de los datos solicitados y la CHT está de acuerdo el equipo del proyecto podría realizar algún tratamiento de los datos para estimar la variable solicitada.

## **Capítulo V**

La información sobre los sectores industriales que se solicita puede recibirse con codificación INE o separada por sectores, lo que resulte más conveniente para la CHT, siendo agrupada posteriormente siguiendo la Clasificación Industrial Internacional Uniforme de todas las actividades económicas (CIIU en adelante) por el equipo del proyecto PROTAGUS.

En relación con las tablas físicas se requieren las detacciones del medio ambiente (elementos del sistema considerados: ríos, embalses, aguas subterráneas, mar, suelo, nieve y lagos) hacia la economía, así como los retornos al mismo, o los suministros provenientes de otro grupo económico (por ejemplo reutilización). Si no se hace uso o no existen retornos en ningún caso de o a alguno de los elementos del sistema, como por ejemplo del elemento nieve, bastará con indicarlo.

Para toda esta sección, si se disponen de datos ya agregados a escala de Sistema de Explotación, aunque no sean a escala mensual (normalmente anualizados o bien para un periodo de varios años), sería preferible emplearlos agregados para evitar contradicciones con datos facilitados en el Plan Hidrológico de cuenca.

En resumen, en cuanto a las cuentas físicas de este capítulo, se requiere:

- Volumen detraído del medio ambiente y de qué elemento con destino a un uso económico y qué grupo económico.
- Volumen retornaido al medio ambiente desde un uso económico y a qué elemento del medio se produce.

Grupos económicos considerados:

- a) Divisiones 1 a 3 CIIU — agricultura, ganadería, silvicultura y pesca;
- b) Divisiones 5 a 33 y 41 a 43 CIIU — que incluyen explotación de minas y canteras, industrias manufactureras y construcción;
- c) División 35 CIIU — suministro de electricidad, gas, vapor y aire acondicionado, en particular, y generación, transmisión y distribución de energía hidroeléctrica (parte de la clase 3510 CIIU);
- d) División 36 CIIU — captación, tratamiento y distribución de agua;
- e) División 37 CIIU — eliminación de aguas residuales por alcantarilla;
- f) Divisiones 38, 39, 45 a 99 CIIU — actividades de servicios.

Para cada uno de los sectores representados en cada grupo, o bien para el total del grupo si no se dispone de más detalle (a excepción del grupo a) que se explica posteriormente) se precisa:

- Volumen suministrado y elemento del medio ambiente del que se obtiene, o grupo económico distinto (en el caso de aguas regeneradas, por ejemplo). Por ejemplo, la agricultura tendrá varias entradas en la base de datos: *i) volumen suministrado desde elemento río (derivaciones de sueltas en embalses) agricultura de regadío, ii) volumen suministrado mediante aguas subterráneas para agricultura de regadío, iii) volumen de elemento suelo (evapotranspiración real) hacia la agricultura (esta información se puede estimar en el proyecto a partir de otras variables si no está disponible), iv) volumen regenerado usado para la agricultura.* En el caso de existir piscifactorías, el volumen extraído y el retornado se considera el mismo siempre que no se produzca mediante derivación en otro elemento del medio ambiente o sea usado por otro grupo económico. *NOTA.- Este grupo es necesario desagregarlo debido a que el uso económico del agua con destino a la agricultura no debida a suministro por riego debe aparecer en las tablas del capítulo VI.*

- Volumen de retorno y elemento del medio ambiente sobre el que se produce, o grupo económico distinto . Por ejemplo: *i) volumen de retorno de regadío a aguas subterráneas por infiltración (si existe esta estimación), ii) volumen de retorno a cauces por escorrentía superficial.*

Sobre el grupo a) se necesitan los suministros a los cuatro sectores representados y desde qué elementos, así como los retornos producidos y a qué elementos. Superficies y cultivos, así como tecnología de suministro. Si se conoce, su evolución durante el periodo considerado (o referencias a los planes de modernización y su fecha de ejecución real y puesta en explotación).

El grupo b) es de difícil división. Se propone que se faciliten los datos, si se tienen disponibles, de los principales usos si además estos tienen suministro independiente concedido.

El grupo c) requiere descomposición del uso en cuanto a la tecnología de producción eléctrica, principalmente para descomponer el uso del agua en refrigeración o transformación de energía gravitatoria en las centrales hidroeléctricas. En el caso de las hidroeléctricas el elemento del medio ambiente del que toman suele ser un embalse y el retorno suele ser en un río. Si no fuese así requeriría aclaración. Si se conoce la energía producida sería un dato muy conveniente para contrastar la información, así como valorar económicalemente el uso del agua. En cuanto al uso de refrigeración se requiere también una estimación del consumo (pérdida por evaporación) y el elemento del medio al que retorna (río o embalse principalmente).

El grupo d) se refiere a los suministros urbanos (que en España en muchas ocasiones agrupan a los suministros industriales y de servicios) o riegos de parques y jardines principalmente. Según la metodología empleada, los retornos en este caso son debidos a pérdidas del sistema que normalmente irán a aguas subterráneas. Los retornos a través del vertido se deben computar como transferencia al grupo económico e) que es quien realiza la devolución al medio. En el caso de no existir tratamiento, si se debería computar salida directamente al medio.

El grupo e) se refiere a los vertidos a cauce o a aguas subterráneas si existiese alguno. La reutilización debe computarse como transferencia a otro grupo económico. La tabla de vertidos podría ser suficiente.

El grupo f) en España se encuentra normalmente dentro de los suministros urbanos correspondientes al grupo d). Si se conoce algún caso singular con grandes detacciones (parques temáticos por ejemplo) sería conveniente señalarlo pero si no es el caso se estimará en función de censos del INE.

Conviene recalcar que cualquier labor de tratamiento de los datos brutos existentes en la CHT para acomodarlos a las necesidades del estudio se realizará por el equipo técnico del proyecto.

## **Capítulo VI**

### **Tabla VI.1**

Respecto a las variables precipitación, temperatura, evapotranspiración potencial, evapotranspiración real (o efectiva), escorrentías superficial, subterránea y total, e infiltración, se precisa:

- Mapas mensuales de las variables si son distintos a los del modelo SIMPA.
- Datos de la red foronómica. Se han obtenido del servidor del CEDEX.
- Trasvases provenientes de y hacia otras cuencas. En el caso del ATS se requieren las cifras mensuales oficiales trasvasadas que serán contrastadas con el trabajo similar que se está realizando en la Demarcación Hidrográfica del Segura.

### **Tabla VI.2**

- Volúmenes intercambiados entre aguas subterráneas y superficiales (ríos ganadores y perdedores).
- Volúmenes de escorrentía por deshielo y fundición de nieve si son conocidos.

En su caso remisión a estudios existentes.

## **Documentación auxiliar**

Hay ciertos documentos que si bien no son estrictamente necesarios, su aportación podría ayudar a contrastar los datos con otras series de datos. Los principales son:

- Acuerdos de la comisiones de desembalse.
- Acuerdos de la Comisión del ATS sobre volúmenes trasvasables.

Todo lo anterior exclusivamente para los años que abarca el proyecto PROTAGUS (2001-2010 ambos inclusive).

**List of possible entities and stakeholders groups from Portugal and Spain (to be contacted)**

Country	Entity	Web-site /link
Portugal	Agência Portuguesa do Ambiente, I. P.	<a href="http://www.apambiente.pt/">http://www.apambiente.pt/</a>
Portugal	Comissão Interministerial de Limites e Bacias Hidrográficas Luso-Espanholas (CILBH)	Official bulletin: <a href="http://www.oasrn.org/upload/apoio/legislacao/pdf/Port117_2012_Albufeiras.pdf">http://www.oasrn.org/upload/apoio/legislacao/pdf/Port117_2012_Albufeiras.pdf</a>
Portugal	Direção-Geral da Autoridade Marítima	<a href="http://autoridademaritima.marinha.pt/PT/sistemaautoridademaritima/dgautoridademaritima/Pages/default.aspx">http://autoridademaritima.marinha.pt/PT/sistemaautoridademaritima/dgautoridademaritima/Pages/default.aspx</a>
Portugal	Direção-Geral de Política do Mar	<a href="http://www.dgpm.mam.gov.pt/Pages/default.aspx">http://www.dgpm.mam.gov.pt/Pages/default.aspx</a>
Portugal	Direção-Geral de Recursos Naturais, Segurança e Serviços Marítimos	<a href="http://www.dgrm.min-agricultura.pt/xportal/xmain?xpid=dgrm">http://www.dgrm.min-agricultura.pt/xportal/xmain?xpid=dgrm</a>
Portugal	Universidade Católica Portuguesa	<a href="http://www.ucp.pt/site/custom/template/ucptplportalhome.asp?sspageid=1&amp;lang=1">http://www.ucp.pt/site/custom/template/ucptplportalhome.asp?sspageid=1&amp;lang=1</a>
Portugal	Universidade de Lisboa	<a href="http://www.ulisboa.pt/">http://www.ulisboa.pt/</a>
Portugal	Ministério da Agricultura e do Mar	<a href="http://www.portugal.gov.pt/pt/os-ministerios/ministerio-da-agricultura-e-do-mar.aspx">http://www.portugal.gov.pt/pt/os-ministerios/ministerio-da-agricultura-e-do-mar.aspx</a>
Portugal	COGRAET-Portugal	<a href="https://coagret.wordpress.com/">https://coagret.wordpress.com/</a>
Portugal	ECO-Cartaxo, Movimento Alternativo e Ecologista	<a href="http://www.ecocartaxo.pt/">http://www.ecocartaxo.pt/</a>
Portugal	GEOTA-Grupo de Estudos de Ordenamento do Território e Ambiente	<a href="http://www.geota.pt/scid/geotawebpage/">http://www.geota.pt/scid/geotawebpage/</a>
Portugal	ProTEJO Movimento pelo Tejo	<a href="http://movimentoprotejo.blogspot.com.es/">http://movimentoprotejo.blogspot.com.es/</a>
Spain	Instituto Internacional de	<a href="http://www.iidma.org/">http://www.iidma.org/</a>

	Derecho y Medio Ambiente	
Spain/Portugal	Comisión para la Aplicación y Desarrollo del Convenio de Albufeira (CADC)	<a href="http://www.magrama.gob.es/es/agua/legislacion/conveniodealbufeira_tcm7-28658.pdf">http://www.magrama.gob.es/es/agua/legislacion/conveniodealbufeira_tcm7-28658.pdf</a>
Spain/Portugal	SEO-Birdlife	<a href="http://www.seo.org/">http://www.seo.org/</a>
Spain	Ecologistas en Acción	<a href="http://www.ecologistasenaccion.es/">http://www.ecologistasenaccion.es/</a>
Spain/Portugal	Greenpeace	<a href="http://www.greenpeace.org/espana/es/">http://www.greenpeace.org/espana/es/</a>
Spain	Universidad de Extremadura	<a href="http://www.unex.es/">http://www.unex.es/</a>
Spain	Dirección General del Agua, Ministerio de Agricultura, Alimentación y Medio Ambiente	<a href="http://www.magrama.gob.es/es/agua/temas/default.aspx">http://www.magrama.gob.es/es/agua/temas/default.aspx</a>
Spain/Portugal	Instituto Hispano Luso	<a href="http://institutohispanoluso.blogspot.com.es/2013/05/instituto-hispano-luso.html">http://institutohispanoluso.blogspot.com.es/2013/05/instituto-hispano-luso.html</a>
Spain	ADRIE- Asociación de Desarrollo Rural Integral Europa	
Spain/Portugal	Red del Tajo/Rede do Tejo (Rede Cidada para Uma Nova Cultura da Agua no Tejo e os seus rios).	<a href="http://www.redtajo.es">www.redtajo.es</a>
Spain	Proyectoríos-Territorios vivos	<a href="http://www.territoriosvivos.org/proyectorios/index.php?ID1=3&amp;ID2=14&amp;Menu2=Qu%E9+es">http://www.territoriosvivos.org/proyectorios/index.php?ID1=3&amp;ID2=14&amp;Menu2=Qu%E9+es</a>
Spain	Plataforma de Toledo en Defensa del Tajo	<a href="https://es-es.facebook.com/pages/Plataforma-de-Toledo-en-Defensa-del-Tajo/131319446927595">https://es-es.facebook.com/pages/Plataforma-de-Toledo-en-Defensa-del-Tajo/131319446927595</a>
Spain	WWF-Adena	<a href="http://www.wwf.es/">http://www.wwf.es/</a>



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## **Annex 7. Internal Grant Agreement**

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**Acuerdo interno del Consorcio formado por EVREN, Evaluación de Recursos Naturales, S. A., la Confederación Hidrográfica del Tajo y la Agencia Portuguesa do Ambiente, al respecto del proyecto financiado con fondos de la Unión Europea “PILOT PROJECT ON WATER BALANCES IN THE TAGUS RIVER BASIN (PROTAGUS)” en el marco de las subvenciones “Dessertification (Water Accounts)”.**

De una parte Dña. ANA NIETO ARIAS, mayor de edad, provista de Documento Nacional de Identidad nº 44861766-J, actuando en representación de **EVREN, Evaluación de Recursos Naturales, S.A.**, con CIF A.46449112, según poderes otorgados el día 24 de junio de 2011 por el Notario de Valencia, Don Fernando Olaizola Martínez, con el nº 953 de su protocolo, inscrito en el Registro Mercantil de Valencia, tomo 3494, libro 807 de la Sección General, folio 16, hoja número V-11177.

De otra parte Dña. :

Y D. :

### **EXPONEN**

1. La Unión Europea representada por la Comisión europea ha otorgado una subvención para la acción titulada "Pilot project on Water Balances in the Tagus River Basin (PROTAGUS)", subvención nº 07.0329/2013/671306/SUB/ENV.C1.
- 2.- El acuerdo de subvención ha sido firmado por D. Juan Bautista Gumbau Bellmunt en representación de EVREN, S.A y Ms Marianne Wenning en representación de la Unión Europea el día 27 de diciembre de 2013.



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2. El coordinador de la ejecución de la acción subvencionada es EVREN, S.A y los beneficiarios de la misma son la Confederación Hidrográfica del Tajo (CHT) de España y la Agencia Portuguesa do Ambiente de Portugal.

3.- El monto máximo de la subvención será de 91.565 € correspondiente al 75 % de los costes totales previstos de la acción que ascienden a 122.087 €.

4.- El plazo para la realización de la acción es de 12 meses a contar desde el 1 de Enero de 2014.

#### **ACUERDAN**

1.- EVREN, S.A actuará como coordinador de la acción subvencionada referida con anterioridad asumiendo las obligaciones que las normas reguladoras de la subvención establecen.

2.- La Confederación Hidrográfica del Tajo (CHT) actuará como beneficiaria de la acción subvencionada referida con anterioridad asumiendo las obligaciones que las normas reguladoras de la subvención establecen.

3.- Los trabajos que realizará la CHT serán los siguientes:

a) Facilitar la recopilación de los datos oficiales disponibles necesarios para completar las tablas estándar del manual de Naciones Unidas sobre cuentas ambientales y económicas del agua (SEEA-Water).

b) Asistir a las reuniones de coordinación y difusión de resultados.

c) Prestar, si fuese necesario, salas para posibles reuniones de coordinación entre socios, o bien para la difusión del proyecto entre organizaciones y usuarios en la parte española de la Demarcación bajo la supervisión de la CHT.

4.- La CHT tiene presupuestada la cantidad de 1.872,50 € en concepto de viajes de su personal a justificar en relación con el proyecto. No es necesario agotar la partida. El presupuesto máximo no podrá ser superado. Los viajes, dietas y pernoctaciones no podrán superar las cuantías máximas que fija la Comisión Europea. EVREN, S. A., actuando como coordinador, realizará las gestiones de adquisición de billetes, reservas y pagos, a expensas



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de justificación escrita acerca de la necesidad del viaje por necesidades del proyecto por parte de la CHT. EVREN, S. A. proporcionará un borrador de justificación en cada caso.

5.- En el caso de que alguno de los viajes que deba realizar el personal de la Confederación Hidrográfica del Tajo fuese abonado por propios fondos de este organismo, al finalizar la acción la Confederación Hidrográfica del Tajo aportará la documentación justificativa de los costes incurridos en la acción para que EVREN, S.A los pueda consolidar con los otros costes de la acción y justificarlos ante la Unión Europea como establecen las normas reguladoras de la subvención.

6.- La Agencia Portuguesa do Ambiente (APA) actuará como beneficiaria de la acción subvencionada referida con anterioridad asumiendo las obligaciones que las normas reguladoras de la subvención establecen.

7.- Los trabajos que realizara la APA serán los siguientes:

a) Facilitar la recopilación de los datos oficiales disponibles necesarios para completar las tablas estándar del manual de Naciones Unidas sobre cuentas ambientales y económicas del agua (SEEA-Water).

b) Asistir a las reuniones de coordinación y difusión de resultados.

c) Prestar, si fuese necesario, salas para posibles reuniones de coordinación entre socios, o bien para la difusión del proyecto entre organizaciones y usuarios en la parte portuguesa de la Demarcación bajo la supervisión de la APA.

8.- La APA tiene presupuestada la cantidad de 2.214,90 € en concepto de viajes de su personal a justificar en relación con el proyecto. No es necesario agotar la partida. El presupuesto máximo no podrá ser superado. Los viajes, dietas y pernoctaciones no podrán superar las cuantías máximas que fija la Comisión Europea. EVREN, S. A., actuando como coordinador, realizará las gestiones de adquisición de billetes, reservas y pagos, a expensas de justificación escrita acerca de la necesidad del viaje por necesidades del proyecto por parte de la APA. EVREN, S. A. proporcionará un borrador de justificación en cada caso.

9.- En el caso de que alguno de los viajes que deba realizar el personal de la APA fuese abonado por propios fondos de éste organismo, al finalizar la acción la APA aportará la documentación justificativa de los costes incurridos en la acción para que EVREN, S.A los



pueda consolidar con los otros costes de la acción y justificarlos ante la Unión Europea como establecen las normas reguladoras de la subvención.

10.- EVREN, S. A. realizará los trabajos descritos en la oferta técnica presentada no correspondientes a la CHT o la APA necesarios para llevar a buen fin la acción.

11.- La propiedad intelectual de los trabajos, será de cada uno de los autores de las distintas partes de los mismos. En los documentos presentados ante la Unión Europea o la Comisión Europea relativos al proyecto se detallará la participación de cada uno de los socios en las partes del mismo. El origen y atribución de la autoría de los datos utilizados deberá quedar reflejado en los documentos y bases de datos que se elaboren a partir de ellos.

12.- Las partes reconocen que, al ser un proyecto que puede requerir modificaciones en los hitos a requerimiento de la entidad financiadora, el presente acuerdo pueda incorporar en el futuro nuevas cláusulas o modificaciones de las existentes.

Las partes aceptan el presente acuerdo y sus efectos jurídicos y se comprometen a su cumplimiento de buena fe y con sujeción a la normativa y acuerdo de subvención suscrito con la Unión Europea.

En Valencia, a ?? de febrero de 2014	En Lisboa, a ?? de febrero de 2014	En Madrid, a ?? de febrero de 2014
En representación de  EVREN, S. A.  Fdo. Ana Nieto Arias	En representación de  Agencia Portuguesa do Ambiente  Fdo. xxxx	En representación de  Confederación Hidrográfica del Tajo  Fdo. xxxx