

Halting Desertification in the Júcar River Basin

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

SUMMARY OF ECRINS AND SEEAW

Introduction

In 2008, the EC launched a communication on the Shared Environmental Information System (SEIS¹), 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).

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

- **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

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

¹ 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>

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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 CCM², ECRINS offers a smaller number (138,000 instead of >2,000,000) of elementary catchments which average size is 92km². 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:

- CIRCA folder "ECRINS – EEA hydrographic data set" of Hydrography (EcrAncl, Ecrins drainage lines, ECRINS FECs and Ecrins gazetteer – river names).

System of Environmental-Economic Accounting for Water (SEEAW)

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 SEEA 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.

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.

² 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>

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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; 2000-2006³)**, 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 report⁴ 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;*
 - 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;*

³ 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>

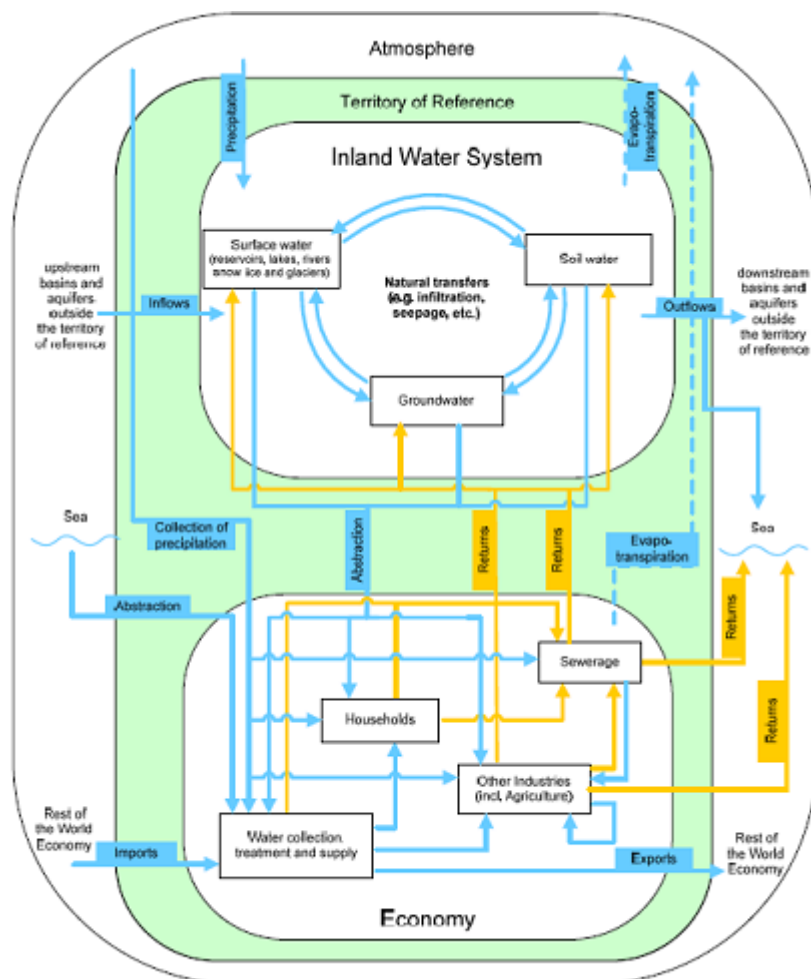
⁴ <http://unstats.un.org/unsd/envaccounting/seeaw/seeawaterwebversion.pdf> : highlights the importance of IWRM, and WFD principles. However, it indicates that economic accounts are generally compiled at the level of administrative regions.

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- 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:



Source: after SEEA-Water.

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Acronyms list

Acronym	Meaning
CCM	Catchment Characterisation and Modelling
ECRINS	European Catchment and Rivers Network System
EEA	European Environment Agency
EIONET	European Environment Information and Observation Network
GEO	Group on Earth Observation
GMES	Global Monitoring for Environment and Security
IWRM	Integrated Water Resources Management
SEEA	System of Integrated Environment and Economic Accounting
SEIS	Shared Environmental Information System (EC Communication, 2008)
SEIS-ENP	SEIS-European Neighbourhood Policy
SoE	State of the Environment
WFD	Water Framework Directive
WISE	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”⁵.

“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.”⁶

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 occurred. However, the duration of each event and the area and population affected have varied throughout this period.⁷

⁵ United Nations Convention to Combat Desertification (UNCCD).

⁶ 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.

⁷ 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

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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