

# Info factsheet no 1



**ENORASIS**  
**[www.enorasis.eu](http://www.enorasis.eu)**

## Key innovation

As agriculture consumes the largest amount of water globally, irrigation management constitutes a significant environmental challenge, also dictated by EU Common Agricultural Policy and the Water Framework Directive. In this light, the improvement of the environmental performance of irrigation systems is very essential to the prevention of misuse of water. ENORASIS aims to develop an irrigation management Decision Support System for farmers and water management organizations that will combine precision agriculture benefits with the optimization of water consumption. ENORASIS system will actually target to motivate farmers to optimize the use of water, whereas it will also provide to water management organizations the ability to effectively forecast and manage irrigation water resources, cover irrigation demand and charge customers (farmers) on the basis of motives and incentives that exploit irrigation demand side fluctuations.

### Contract number

GA No 282949

### Project coordinator

DRAXIS Environmental SA

### Contact person

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### Project website

[www.enorasis.eu](http://www.enorasis.eu)

### Community contribution

2.085.965, 00 €

### Duration

January 2012- December 2014

## Technical approach

The basic parameters and enabling technologies of ENORASIS Service Platform and Components are:

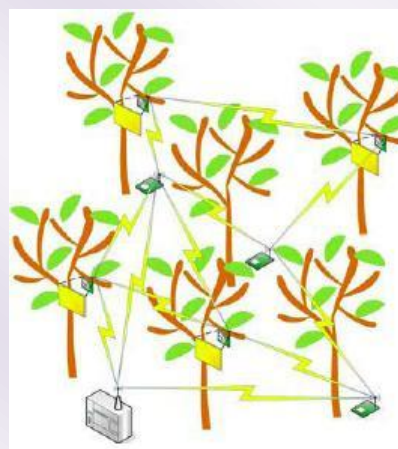
- **Decision Support System** based on GIS technologies, acting as the main information backbone of the platform
- **Irrigation Management System**, performing the assessment of irrigation water needs and controlling irrigation management rules
- **Meteorological Analysis Tools**, assimilating advanced weather forecast models and satellite data
- **Field hardware** (wireless sensors networks etc.) to be deployed in farmers fields for measurements and reporting purposes
- **Information Exchange System**, to be used by farmers/water management companies and ENORASIS Service Platform.

## Technical results

During the first semester of the project, partners work was focused on three axes: **identification of basic technical requirements, business modelling** and **use case scenarios definition**.

### a) Identification of basic technical requirements

**State-of-the-art report:** A comprehensive **state-of-the-art report** of the main ICT technologies and applications relevant to precision irrigation was prepared in the first semester of the project. These applications draw mainly from three domains: **wireless sensor networks, remote sensing** and **geographic information systems (GIS)**. Wireless sensor networks and remote sensing provide data that can be used to assess the water needs of crops and predict precipitation and soil moisture dynamics in the near future, while the GISs are needed to store data and present it to the shareholders.

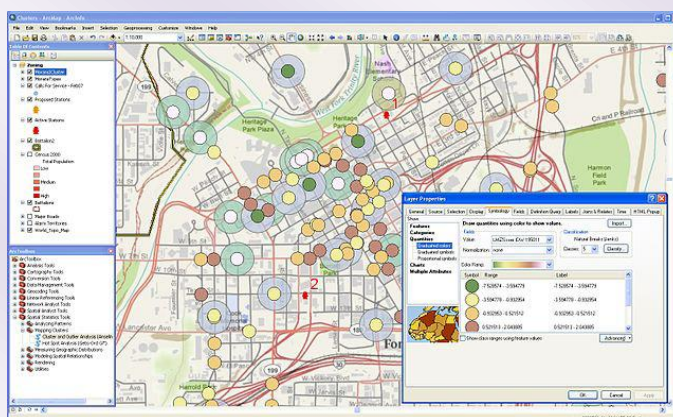


Wireless sensors networks technology promises to deliver unparalleled spatial and temporal resolution in monitoring of agricultural crops. In the **state-of-the-art report**, several technical aspects about sensor node hardware and high- and low-level communication protocols are discussed. The hardware solutions

provided by different manufacturers are presented and evaluated, as well as the commercially available sensor networks solutions designed specifically for smart irrigation.

Remote sensing in agriculture is a field that traditionally relies on the use of satellite images to assess the needs of crops. For smart irrigation, satellite imagery can be used to derive plenty geophysical and biophysical parameters, which can be useful in monitoring a large part of the water cycle, as well as crop health and water requirements at any given point in time. The overview of available and upcoming satellite products, provided in the **state-of-the-art report**, is intended as a repository of knowledge regarding satellite products that can be of interest for irrigation management. In addition to comparing different products in terms of their potential, availability and precision, special care was given to state the ways in which a practitioner can obtain this data, as well as the format in which one can expect to get it.

GIS is a mature field with numerous commercial and open-source solutions available. The **state-of-the-art report** discusses those most commonly used and provides an overview of their functionality. Although the technology has been around for quite some time, systems intended for precision agriculture are a novel development and none specialized in precision irrigation management exist. Hopefully ENORASIS project will help bridge this gap.



The **state-of-the-art technical analysis report** is publicly available through ENORASIS website <http://www.enorasis.eu/page/deliverables>.

**Agricultural Process Analysis Report:** Apart from state-of-the-art technologies, modeling aspects of irrigation scheduling and weather forecast were investigated in the first project semester and a relevant report was created (**agricultural process analysis report**). Fundamental factors affecting irrigation planning (soil/land classification, plant characteristics, water characteristics, irrigation systems etc) were extensively analyzed, as well as the needs in terms of data sources induced by the user needs. Data needs analysis included both raw data as well as derivative data achievable from available

modeling and spatial analysis tools. Finally, a model repository was created with information about basic model features and model documentation.

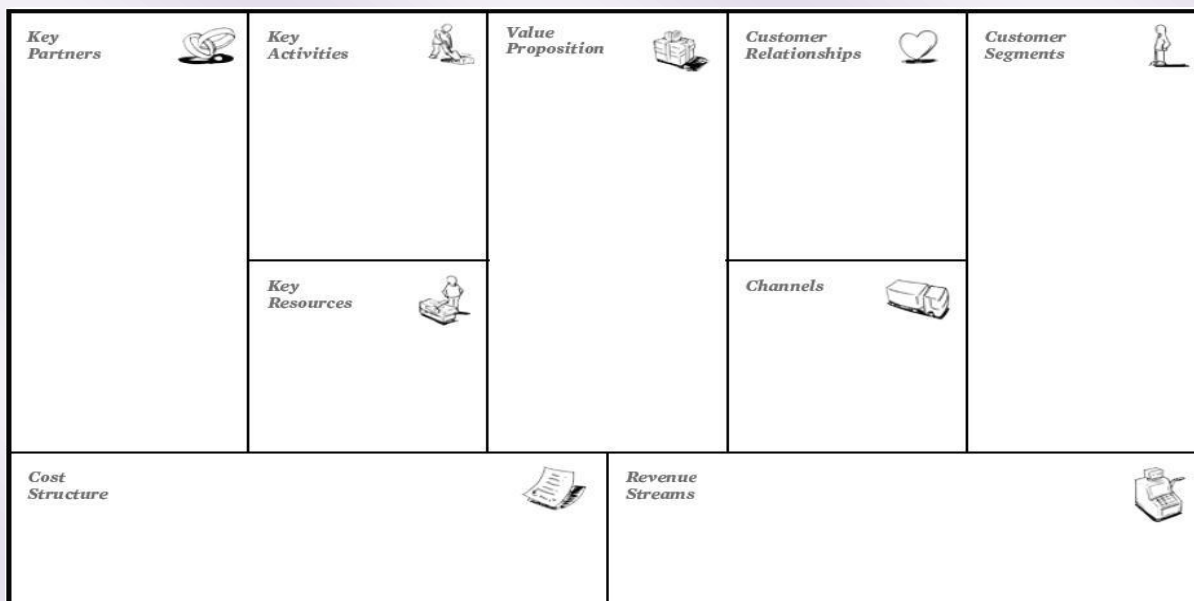
The **agricultural process analysis report** is publicly available through ENORASIS website <http://www.enorasis.eu/page/deliverables>.

## b) Business modelling

**Irrigation water governance report:** The current agricultural and irrigation situation of all countries represented in the ENORASIS project (Cyprus, France, Germany, Greece, Italy, Malta, Poland, Portugal, Romania, Serbia, Spain, Switzerland, Turkey), plus three more European Mediterranean countries with a large share of their cropland irrigated (Italy, Malta, Portugal) is presented in **irrigation water governance report** that was prepared in the first project semester. Details on water governance and pricing are also available for Cyprus, France, Greece, Italy, Poland, Serbia and Turkey, in the context of Water Framework Directive (WFD), Common Agricultural Policy (CAP 2003) and CAP 2013 reform. A global review of current irrigation scheduling support services is attempted, based on literature and websites and information on irrigation stakeholders, practices and opportunities obtained from interviews and meetings with farmers, agricultural cooperatives, agricultural research and extension services, meteorological services, water providers, agro-businesses and researchers in the abovementioned countries.

The **irrigation water governance report** is publicly available through ENORASIS website <http://www.enorasis.eu/page/deliverables>.

**ENORASIS business models:** Potential business models for the ENORASIS solution were identified and analyzed during project first semester. A generic business model to include as much as possible potential choices was at first elaborated, followed by the definition of three alternative, complementary business models (one per significant Customer Segment, i.e. Farmers, Water Providers, National Water Authorities). The elaboration of the alternative business models for ENORASIS was based on an analytical approach based on the Business Models CANVAS methodology and for their evaluation, Business Models SWOT analysis, as well as Balanced Scoreboard methodology was implemented. Due to the lack of stability of the external environment (political and economic), as well as to the great variety of potential customers' characteristics and needs, ENORASIS should be generic and flexible enough to adapt to different requirements and market conditions.



The **ENORASIS business models report** is publicly available through ENORASIS website <http://www.enorasis.eu/page/deliverables>.

### c) Use case scenarios definition

**ENORASIS platform architecture and use case scenarios and requirements:** The architecture of ENORASIS platform was depicted, so as to provide a description of the elements and interfaces necessary for the implementation of the modules and sustainable agriculture components.

After that, use case scenarios that describe the sequence of interactions between actors and the system necessary to deliver the ENORASIS services were elaborated. The aim was to develop a complete set of use cases specifying all the different ways to use ENORASIS, including alternative sequences, error handling etc. The analysis includes: user requirements through the entire life cycle, derived functionalities and processes, top-level ENORASIS system functional and performance requirements, multi-stakeholder cooperation and interoperability and key performance indicators

Use case steps are written in an easy-to-understand structured narrative using the sustainable irrigation domain vocabulary and are publicly available in the **ENORASIS platform use case scenarios and user requirements report** through ENORASIS website <http://www.enorasis.eu/page/deliverables>.

## Learn more about ENORASIS project

Visit the ENORASIS knowledge web portal [www.enorasis.eu](http://www.enorasis.eu) for information about the project and project activities, and the ENORASIS portal knowledge base to get access to useful material about technological aspects (wireless sensor networks, remote sensing data, GIS applications), modelling aspects, Water Governance Legal and other issues, and irrigation management.

All project deliverables of public dissemination level as well as project dissemination material (leaflets, posters etc.) are available in [www.enorasis.eu/download](http://www.enorasis.eu/download).

Also join ENORASIS in social media to take part in our web-community of irrigation management interested stakeholders and get informed about all project news and activities.



: ENORASIS FP7 Project (page)



: Enorasis\_FP7



: ENORASIS FP7 PROJECT (Group)

Access to ENORASIS social media is also possible from <http://www.enorasis.eu>

Partner	Country
<b>DRAXIS Environmental Technologies S.A.</b>	Greece
<b>Rhenish Institute for Environmental Research, University of Cologne (RIU)</b>	Germany
<b>Institute of Soil Science and Plant Cultivation- State Research Institute (IUNG-PIB)</b>	Poland
<b>Noveltis SAS</b>	France
<b>Faculty of Technical Sciences, University of Novi Sad, Biosense Centre</b>	Serbia
<b>Imaxdi Real Innovation S.L.,</b>	Spain
<b>The Cyprus Institute</b>	Cyprus
<b>University of Patras</b>	Greece
<b>Institute of Earth Sciences (SUPSI)</b>	Switzerland
<b>Teknoset Ltd</b>	Turkey
<b>Unisoft Romania S.A.</b>	Romania
<b>Q-PLAN North Greece Ltd.</b>	Greece
<b>Public Water Management Company "Vode Vojvodine"</b>	Serbia