

## IDE-OTALEX C. The big challenge of the first Crossborder SDI between Spain and Portugal

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### Abstract

The SDI implementation is an average difficult work. There should be an understanding between political and scientific interests, technological advances and it is also quite recommended to meet the needs of citizens.

A cross-border SDI implementation, where three levels of administration belonging to two countries must be considered, may seem impossible to do, but it is not only a possible task, but also an enriching and useful task to study the reality of the territory and its sustainable development.

IDE OTALEXC is the first crossborder spatial data infrastructure characterized for being a distributed, decentralized, modular and collaborative system, based on standards OGC (Open Geospatial Consortium), W3C (World Wide Web Consortium), ISO (International Organization for Standardization) and open source technology.

## 1 Introduction

The Alentejo (Portugal), Extremadura (Spain) and recently Centro (Portugal) regions, are working along 16 years, several projects with the co-finance of the crossborder cooperation programs for Spain-Portugal of the ERDF (European Regional Development Fund) on study the reality and sustainable development of territory.

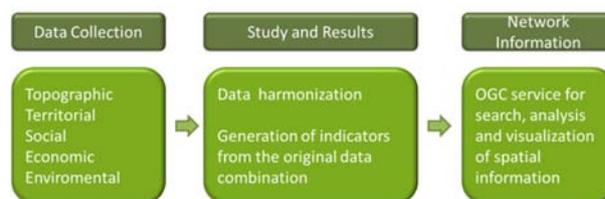
Three regions have similar characteristics; sparsely populated regions (less than 37 inhabitants per km<sup>2</sup>), whose main economic activities are agriculture and services and important environmental areas with several nature conservation sites and protected areas (Natura2000 sites, Birds Protection Areas and National Parks).

Figure 1: OTALEX C area.



IDE-OTALEX C has developed an Indicator System— SI-OTALEX C, to identify, measure, monitor and evaluate human pressures and its dynamics in the region. The established set of indicators has a common and standard structure designed by a multidisciplinary team with experts from both countries. Its main objective is to evaluate the transformations of the territory and help to solve common problems of the territory and their populations.

Figure 2: Basic schema of IDE-OTALEX C workflow.

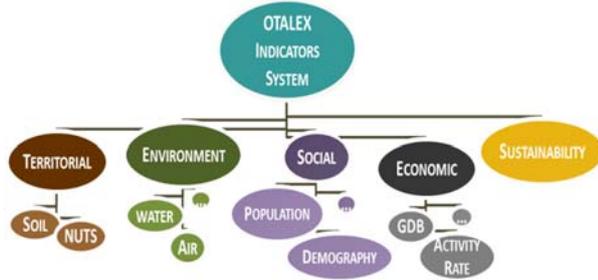


## 2 Data and Monitoring

Following the guidelines of the EU-SDS (Sustainable Development Strategy of the European Union), the national Development Strategies for Portugal and Spain, SI-OTALEX C was framed by the conceptual model PSR (Pressure-State-Response), adopted from Ref. [1]. Although, we know that

choices always involves disregarding something [1], since there is no universal set established, and there is such a high and diverse number of indicators, the core indicators for SI-OTALEXC was built with those that best fit the project objectives, had more relevance and representativeness in the area, and also easily available and measurable. Furthermore they should be simple, easy to read and update.

Figure 3: Basic OTALEXC Indicator System (SI-OTALEXC).



SI-OTALEXC has over sixty indicators grouped into twenty two themes, in turn, the themes, are grouped into five vectors as shown in the figure 3: Territory, Environment, Social, Economy and Sustainability

Table 1: SI-OTALEXC main structure.

VECTOR	THEME
01. Territory	01. Climate
	02. Geology and Geomorphology
	03. Hydrography
	04. Soil
	05. Administrative structure
02. Environment	01. Air
	02. Water
	03. Waste
	04. Pollution Sources
	05. Land use
	06. Environmental performances and Urban spaces
	07. Noise
	08. Energy
	09. Nature conservation
	10. Landscape
	11. Soil protection
03. Social	01. Population
	02. Demographic structure
	03. Equipment's and Services network
04. Economy	01. Economic activities
	01. Territorial matrix

05. Sustainability      02. Sustainable transport

### 3 IDE-OTALEXC

Spatial data infrastructures are, in general, for their characteristics, the best technological tool to publish sustainability data in the web. They can synthesize, calculate and analyse spatial data through interoperable web based services. SDIs are essential to manage natural resources, economic development and environment protection in a way to monitor the changes of the territory.

IDE-OTALEXC is the crossborder spatial data infrastructure of Alentejo, Extremadura and Centro. It was implemented in 2007 to share official geographic information between these regions. This has been the most effective way to have a distributed and flexible observatory for sustainable development and environment protection in this rural and low populated regions [3]. It also contributes to territorial cohesion, one of the tree main pillars of European Cohesion Policy.

Figure 4: Home page of website IDE-OTALEXC www.ideotalex.eu



IDE-OTALEXC is a distributed, decentralized, modular and collaborative system, based on standards (OGC, W3C, ISO) and open source technology, developed to guarantee interoperability between the different GIS provided by each project partner and OTALEX C itself.

Sam of the main results is:

- Data harmonization (cartography and indicators) on both sides of the border (fig. 5).
- Development of Analysis Tools through OGC standard WPS (Web Processing Services).
- Work with network and local information:
  - WMS load
  - KML file load
  - GML file load
  - SHP file load
- Geometry drawing and editing tools.
- Local Nodes Remote Administration (BackOffice). Remotely enables management of information from different local nodes.
- Tools for citizen participation.

- I + D developments. In this workgroup there have been developments in these two fields:
  - Environmental monitoring (SOS), responsible for collecting the measurements made by each of the sensors that comprise a network of environmental monitoring, and also for processing and publishing the resulting data.
  - Transformation of OTALEX GI into WEB 2.0 (linked data and WEB semantic).
- Network SI-OTALEX C (fig. 6)

Alentejo and Extremadura Territorial and Environmental Observatory, Parliament Magazine's, Regional Review Open Days, 2009, 14: 135.

Figure 5: Cartography harmonization

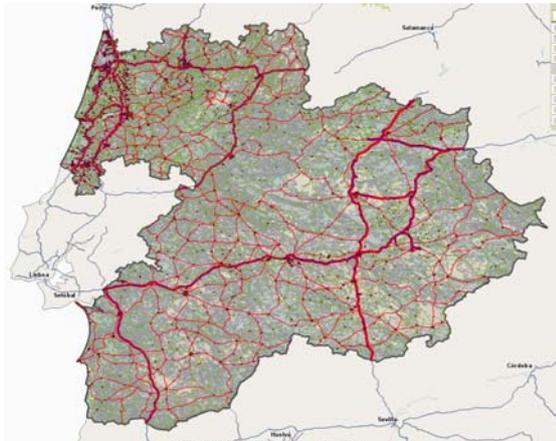
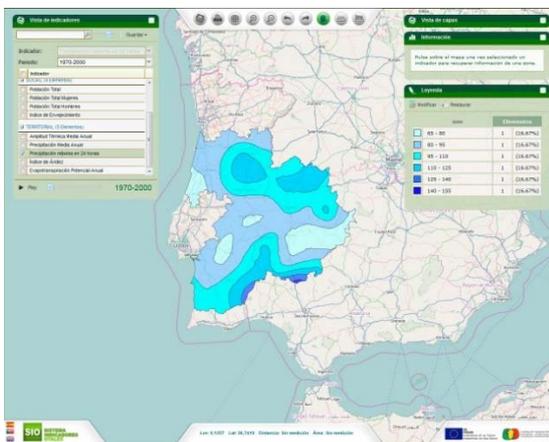


Figure 6: Network SI-OTALEX C



#### 4 References

- [1] OECD. OECD core set of indicators for environmental performance reviews. OECD Environment Monographs 1993, No. 83.
- [2] IISD. Indicators for Sustainable Development: Theory, Methods, Applications. A Report to the Balaton Group. International Institute for Sustainable Development, Hartmut Bossel (Ed.), 1999.
- [3] T. Batista. Spatial Data Infrastructures - key issue for territorial cooperation in Europe: IDE-OTALEX -