STUDY OF THE SOCIO-ECONOMIC IMPACT OF THE SPATIAL DATA INFRASTRUCTURE IN THE REGION OF CATALUNYA: EXECUTIVE SUMMARY

Background

In January 2006, the Joint Research Centre of the European Commission organised a workshop to review best practice in the assessment of Spatial Data Infrastructures (SDIs), compare methodologies and findings, and see also what lessons could be learned from similar large scale infrastructures. Among the key findings of that workshop were the need to give priority to longitudinal studies of SDIs in progress, paying particular attention to sub-national/regional SDIs, and to application-driven approaches able to identify more easily stakeholders, user communities, and potential benefits (see Craglia and Nowak 2006[1]).

As a follow-up of that workshop, the Spatial Data Infrastructures Unit of the JRC commissioned a study of the socio-economic impact of the SDI in Catalunya to the Centre of Land Policy and Valuations of the Universitat Politècnica de Catalunya. The one-year study, which was concluded in December 2007, had the following objectives:

- Analyse the cost and benefits related with the setup and maintenance of the Catalan SDI as well as the services utilised by different organisations and user groups;
- Define clear and transparent methodologies for the quantitative and qualitative evaluation of the socioeconomic benefits of SDI;
- Critically evaluate the lessons learned from the study as input for future research in this important field.

Although relevantly recent (development started in 2002), the SDI of Catalunya (IDEC) has a number of characteristics that make its study of particular interest:

- The IDEC is a collaborative project between the Cartographic Institute of Catalunya (ICC) and two separate departments of the regional authority, Land Policy and Public Works, and Information and Telecommunications Society with funding from the e-government budget.
- The IDEC is not directly involved in the production and maintenance of topographic data, which is the responsibility of the ICC, but focuses solely on the added value of an SDI, i.e. the technological and organisational platform promoting the dissemination and re-use of geographic information across the public and private sectors, education and research establishments and the general public. It has therefore been able to keep a clear audit trail of the costs associated with the SDI development and operations separately from the data production and maintenance costs.
- The IDEC has a specific line of activity, and related funding, to disseminate SDI concepts and technologies to local municipalities with a view to modernise public administration and improve services to citizens and local businesses. Since 2005, over 100 communes have joined this project out of a total of 946. Because local municipalities are the level of public administration closer to the general public in the provision of services, there is a particular interest to study the extent to which SDIs have social and economic impacts at his local level.

[1] http://www.ec-gis.org/sdi//ws/costbenefit2006/reports/report_sdi_crossbenefit%20.pdf

- The IDEC was the first initiative to create an SDI in Spain and has been followed by several other regions since, promoting a distributed model for a national SDI as the sum of its regional components, and of nation-wide services, such as the cadastre, which is of particular interest to INSPIRE.
- In 2006-07 the Catalan division of the national Spanish GI association (AESIG) undertook a study of the private and public GI sectors in Catalunya to identify their key characteristics, changes since 2002 (when a previous study was conducted), and market trends. This study estimated the business volume of both private and public GI sectors to be around 80 million Euros per annum, accounting for some 20% of the national market share. The findings of this study, and another survey of GI users by AESIG which is still in progress provide a very useful context to the study commissioned by the JRC.

Methodology

The study selected a series of potential indicators to measure the efficiency, effectiveness, and wider socio-economic benefits for an SDI out of those proposed, in the context of e-government, by the "*eGovernment Economics Project (eGEP) - Measurement Framework*" **(**http://82.187.13.175/egep/asp/E_Home.asp). The initial list was discussed with a panel of local authorities in the region, revised, and then piloted before undertaking the field work through detailed interviews.

A sample of 20 local authorities participating in the IDEC-Local project, 3 control local authorities not participating in that programme, and 15 end-user organisations (12 private companies operating in the GI sector, and 3 large institutional users of GI) were interviewed.

The findings of the interviews were presented in two separate workshops to the participating local authorities, and end-user organisations to validate the findings and discuss the outcomes.

Key Findings

Costs:

The total direct cost to establish and operate the Catalan SDI (IDEC) over a five year period (2002-06) was of 1.5 million Euros, of which 325,000 Euros for each of the first two years (2002-03) necessary to launch the SDI, and 283,000 Euros per annum to operate and develop the infrastructure in the three subsequent years (2004-06). Human resources represented 60% of the costs during the launching period (the rest being capital investment), and 80% during operation.

These costs do not include the creation and updating of topographic data, which is under the responsibility of the ICC, and would happen regardless of the development of the SDI, nor the indirect costs associated with the physical and technological infrastructure (e.g. office space) provided by the ICC. They do include the following: metadata creation and maintenance, geo-services (including geoportal, catalogue, WMS client), preparation of data for publication, applications, hardware and software, and management.

Benefits:
The benefits were analysed for 2006 at the level of local public administrations (Communes), and for the private sector and institutional end-users. Although the latter experiences some benefit from the development of the IDEC, the evidence collected clearly shows that the main benefits accrue at the local level through efficiency benefits internal to the public administrations (time saved in internal queries by technical staff, time saved in attending queries by the public, time saved in internal procedures and the redesign of internal processes) and effectiveness benefits (time saved by the public and by companies in dealing with public administration).

Extrapolating the detailed findings from 20 local communes to the 100 that participate in the IDEC local project, the study estimated that efficiency benefits account for over 500 hours per month. Using an hourly rate of 30 Euros for technical staff in local government, these savings exceed 2.6 million Euros per year[2]. Effectiveness savings are almost as large at approximately 480 hours per month.

Even considering only the efficiency benefits for 2006 (i.e. ignoring those that may have accrued in 2004-05, as well as the effectiveness benefits), the study indicates that the initial investment to set up the IDEC SDI is recovered in just 4 months. If the operating costs for 2004-05 area also included, the pay back period increases to just over 6 months.

Wider socio-economic benefits have also been identified but not quantified. In particular, the study indicates that web-based spatial services allow smaller local authorities to reduce the gap with larger ones in the provision of services to citizens and companies. The illustrative case-study of the difference between two local communes, one which enables citizens to query their cadastral parcels and get all the necessary planning and building permission on line, while the other requires the process to be done by hand after making an appointment with the local technician illustrates well the opportunities offered by the IDEC SDI.

Conclusions
This study of the socio-economic impact of the Spatial Data Infrastructure in Catalunya was commissioned by the Joint Research Centre and carried out by the Centre of Land Policy and Valuations of the Universitat Politècnica de Catalunya. The study is important in at least three respects:

- It clearly shows the high yield of investing in a spatial data infrastructure when applications are clearly targeted to identifiable users (public administration, citizens, companies).
- It tests a set of indicators suitable for assessing the social and economic impacts of an SDI and identifies a number of useful lessons learned in the administration and analysis of the survey which can then be reused in future studies (see Annex).
- It shows the value of collecting such indicators through in depth interviews to ensure the quality of the results.

The full report will be published in the coming weeks on the INSPIRE web site (www.ec-gis.org/inspire)

[2] Calculated over 11 months per year and 147 hours per month.

Annex: Indicators selected for the Local Public Administrations Survey
(slightly modified indicators were used for the survey of companies and institutional end users)

EFFICIENCY

Impact	Indicator
Monetary gains	Savings in time (hours/month)
	Expected or predicted savings in consumables (Euros/month)
Better prepared personnel	More motivated employees with new training (number)
Improvements in the organisation	Time saved in the redesigned processes (hours/month)
	New processes (*e.g.* cadastre maintenance, license teams) (list-qualitative)
	Interoperable services (*e.g.* public service, permits) (list-qualitative)
	Interdepartmental data sharing (list-qualitative)
	Better planning of actions and decisions (list-qualitative)
	GIS services accessible from municipal websites (list-qualitative)

EFFECTIVENESS

Impact	Indicator
Benefits for residents	Time saved by residents (hours/moth)
	Time saved by companies (hours/moth)
User satisfaction	Repeat users of services (numbers, %)
	Volume of data queries and downloads (number)
	User satisfaction (qualitative)
Extension of services	Use of new services by businesses)number)
	Use of new services by residents (increase per month)
	Uses enabled exclusively by SDI (qualitative)

DEMOCRACY

Impact	Indicator
Openness and transparency	Interactive services and web access (number)
	Available metadata records (number)
Participation	Complaints, queries, suggestions, errors, etc. transmitted electronically (number/month)