



INSPIRE
Infrastructure for Spatial Information in Europe

Member State Report: Spain, 2009

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1. Executive summary

This is the official report on the development of INSPIRE in Spain during the period 2007-2009 in response to the mandate of Commission Decision 2009/442/EC, of 5 June, implementing Directive 2007/2/EC of the European Parliament and of the Council as regards monitoring and reporting.

The structure of this document responds to the instructions received from the EC INSPIRE Team, the EC team responsible for developing the implementing rules of the INSPIRE Directive, to comply with Commission Decision 2009/442/EC.

In Spain the development of Spatial Data Infrastructure (SDI) is carried out at each one of the three administrative levels: national, regional and local. During the period 2007-2009 the implementation of reference geo-portals has been completed at national and regional level, as well as many of a local scope.

Furthermore, specific monitoring has been carried out of the development of the INSPIRE initiative by means of regular meetings of the Working Group of the Spatial Data Infrastructure of Spain (GT IDEE) of the Geographic High Council (CSG). This Group has coordinated Spanish participation in the different INSPIRE Working Group and has served as a means for disseminating the different agreements reached. Moreover, it has promoted agreements to harmonise and encourage data collection, the preparation of nomenclatures and the publication of interoperable web services. Another mission of the GT IDEE has been the discussion of the Law on Infrastructures and Geographic Information Services in Spain (LISIGE) which transposes the INSPIRE Directive into Spanish legislation, since it was approved by the Cortes Generales españolas (Spanish Parliament) on 17 June 2010. The Specialised Commission for Geographic Standards (CENG) of the CSG has also closely followed the progress of the work for preparation of the specifications of the data themes in Annex I.

This period has been characterised by the publication of the first legal framework at national level to regulate the SDI, defining the National Infrastructure for Geographical Information (INIG), currently named Infrastructure of Geographic Information of Spain (IIGE), and establishing a generic geo-portal for the whole of Spain, IDEE, the Spanish acronym for Spatial Data Infrastructure of Spain, and a geo-portal corresponding to the General State Administration, IDEAGE.

In general, growth can be seen in web service applications of interest to companies, universities and users in general.

2. Abbreviations and Acronyms

AGE	Administración General del Estado (General State Administration)
AOC	Consorci Administració Oberta de Catalunya (Consortium for Open Administration of Catalonia)
API	Application Programming Interface
BTA	Base Topográfica Armonizada (Harmonised Topographic Database)
CCAA	Comunidades Autónomas (Autonomous Communities)
CE IDE	Comisión Especializada en IDE del Consejo Superior Geográfico (Specialised Commission on SDI of the Geographic High Council)
CENG	Comisión Especializada de Normas Geográficas (Specialised Commission on Geographic Standards)
CNIG	Centro Nacional de Información Geográfica (National Centre for Geographic Information)
CSG	Consejo Superior Geográfico (Geographic High Council)
EFQM	European Foundation for Quality Management Model
GT IDEE	Grupo de Trabajo de la Infraestructura de Datos Espaciales de España (Working Group of the Spatial Data Infrastructure of Spain)
ICC	Institut Cartogràfic de Catalunya (Cartographic Institute of Catalonia)
IDEAGE	Infraestructura de Datos Espaciales de la Administración General del Estado (Spatial Data Infrastructure of the General State Administration)
IDEC	Infraestructura de Dades Espacials de Catalunya (Spatial Data Infrastructure of Catalonia)
IDEE	Infraestructura de Datos Espaciales de España (Spatial Data Infrastructure of Spain)
IGN	Instituto Geográfico Nacional (National Geographic Institute)
INIG	Infraestructura Nacional de Información Geográfica (Geographic Information National Infrastructure)
IIGE	Infraestructura de Información Geográfica de España (Geographic Information Infrastructure of Spain)
INSPIRE	Directive 2007/2/EC
PSI	Public Sector Information
JIDEE	Jornadas Técnicas de la Infraestructura de Datos Espaciales de España (Technical Congress of the Spatial Data Infrastructure of Spain)
JIIIDE	Jornadas Ibéricas de Infraestructuras de Datos Espaciales (Iberian Congress of Spatial Data Infrastructures)
LISIGE	Ley sobre las Infraestructuras y los Servicios de Información Geográfica en España (Law on Geographic Information Infrastructures and Services in Spain)
LMO	INSPIRE Legally Mandated Organisations
MNE	Modelo de Nomenclátor de España (Spanish Gazetteer Model)
NEM	Núcleo Español de Metadatos (Metadata Spanish Profile)
OGC	Open Geospatial Consortium
PNOA	Plan Nacional de Ortofotografía Aérea (National Aerial Orthophotography Plan)
QMS	Quality Management System
RCC	Registro Central de Cartografía (Central Cartographic Register)
SCN	Sistema Cartográfico Nacional (National Cartographic System)
SDI	Spatial Data Infrastructure
SDIC	INSPIRE Spatial Data Interest Communities
SIOSE	Sistema de Información sobre Ocupación del Suelo de España (Information System on Land Cover and Use of Spain)
SLD	Styled Layer Descriptor
WMS	Web Map Service

3. Introduction

The development of SDI projects in Spain has been carried out progressively in recent years, with different but constant rhythms in the three levels at which the country is organised administratively: National, represented by the organisations of the General State Administration; Regional, represented by the governments of the Autonomous Communities; and Local, represented by Provincial, Inter-Island, Island and City Councils. This development has been led by the public sector and, more specifically, by the Mapping Agencies that produce geographic information.

From pioneering initiatives such as that Catalonia SDI, which implemented its IDEC geo-portal in 2002, to date, the Geographic High Council (CSG) has been the framework for meetings and a stimulus for the development of SDIs in Spain. The CSG is a consultative body of the Ministry of Infrastructures and Transport which covers all the Spanish public sector producers of geographic information and which has as its objective the coordination of the Public Administrations on the subject of geographic information. 2007 saw the approval of the Royal Decree 1545/2007¹ which regulates it and which establishes the bases for the INIG. Moreover, initiatives have arisen from the CSG such as the IDEE national reference geo-portal, the definition of the Harmonised Topographical Base or the Spanish Gazetteer Model; various recommendations that have transferred different international rules, such as the NEM metadata profile, to the Spanish sphere in a collaborative manner agreed by consensus, and which have stimulated and disseminated the adoption of key standards to ensure interoperability, such as all those prepared by the OGC.

The CSG is the body that has been designated by the Government of Spain (and now also by the Parliament) as the contact point for the development of the INSPIRE Directive and from which it has been attempted to coordinate Spanish participation in this project. From the GT IDEE, present in INSPIRE as an LMO, an attempt has been made to respond to the calls for participation which have been made and its basic precepts have been taken into account in all the stimulation and dissemination activities undertaken by the CSG. The GT IDEE has coordinated Spanish participation in the Working Parties for the Annex I Data Specifications, and other INSPIRE Working Groups and it has performed the technical work, searching for consensus between the main stakeholders, for the Law on Infrastructures and Geographical Information Services in Spain, responsible for the transposition of the INSPIRE Directive to the Spanish legal system. The CENG, present in INSPIRE as a SDIC, has participated in the INSPIRE Thematic Working Groups for the Data Specifications on Hydrography and Transport Networks, contributing its experience and material.

The National Geographic Institute (IGN) is responsible for the Technical Secretariat of the CSG. It assumes the development and operation of the IDEE geo-portal² and develops projects, in collaboration with the Autonomous Community Administrations, for the generation of geographic reference information applying the principle of interoperability. The IDEE geo-portal serves as an umbrella for the other reference geo-portals of the Autonomous Communities and offers an extensive catalogue, which aims to be as complete as possible, of data sets, geo-portals and web services available in Spain. In addition, it offers different access services and serves as a platform to inform, promote and disseminate the paradigm of the SDIs and the INSPIRE Directive. Despite the clear leadership of the CSG, it should be emphasised that all the stakeholders work on the basis of equality, in such a way that they participate as equal nodes in the Spanish SDI network.

Until the approval of the LISIGE, there was no common general policy for the dissemination and marketing of Public Sector Information. But there was a clear guideline for organisations producing geographic information to facilitate access for the discovery and viewing of this information without restrictions via interoperable web services. An example of this is the Directorate General for Cadastre which, since 2004, has offered continuous free access to all its geographic and literal data. Now the LISIGE establishes that this access for the discovery and viewing of data should be without restrictions

¹ Royal Decree 1545/2007, of 23 November, which regulates the National Cartographic System.

² <http://www.idee.es>

and free of charge. Furthermore, free of charge data download services have recently been proliferating, although it is premature to speak of their generalisation.

Regarding this report

This report has been compiled using the structure proposed by the EC INSPIRE Team and in compliance with Commission Decision 2009/442/EC, of 5 June, implementing Directive 2007/2/EC of the European Parliament and of the Council as regards monitoring and reporting.

It has been compiled by the CSG based on the documentation generated in the nine meetings of the GT IDEE which took place during the period 2007-2009³; the communications presented in the three Technical Congresses of the Infrastructure for Spatial Data of Spain (JIDEE)⁴ during the same period and various documents related with the development of SDIs in Spain⁵. Use has also been made of the information published in the catalogues compiled by the IDEE geo-portal⁶, in the monthly bulletin *Sobre IDEs* published by the GT IDEE⁷ and the recent operation for the collection of information for the monitoring of INSPIRE in Spain⁸.

Beginning with a basic draft, this document has been reviewed by all the stakeholders who have participated in the INSPIRE Monitoring and Reporting operation.

³ http://www.idee.es/show.do?to=pideep_reuniones.EN

⁴ http://www.idee.es/show.do?to=pideep_presentaciones.EN

⁵ EC-INSPIRE (2008) Spatial Data Infrastructures in Spain: State of play 2007.

⁶ http://www.idee.es/show.do?to=pideep_catalogoIDEE.EN

⁷ http://www.idee.es/show.do?to=Sobre_iDEs.EN

⁸ Document <100517 indicators_INSPIRE_2009_Spain.xls>, sent on 17 May 2010, which reports the data for the calculation of the INSPIRE indicators according to Decision 2009/442/EC of the Commission, of 5 June, implementing Directive 2007/2/EC of the European Parliament and of the Council as regards monitoring and reporting.

4. Coordination and quality assurance

4.1 Coordination

4.1.1 Member State contact point

Name and contact information

Member State Contact Point	
Name of the public authority	Consejo Superior Geográfico (Geographic High Council)
Contact information:	
Mailing address	Secretaría Técnica del Consejo Superior Geográfico Instituto Geográfico Nacional General Ibañez de Íbero, 3 28003 – Madrid
Telephone number	
Telefax number	
Email address	
Organisation's website URL	http://www.fomento.es/MFOM/LANG_CASTELLANO/DIRECCIONES_GENERALES/ORGANOS_COLEGIADOS/CSG/
Contact person	Sebastián Mas Mayoral
Email address	smas@fomento.es
Telephone number	+34 91 5979646
Contact person - substitute	Cayetano Burgos Sierra
Email address	cburgos@mma.es
Telephone number	+34 91 3475304

Role and responsibilities

The CSG is the management body of the National Cartographic System (SCN). It is a collegiate body, attached to the Ministry of Infrastructure and Transports Public Works and Transport, and it performs the consultative and general planning function for the geographic information and official cartography⁹.

The SCN is the obligatory framework of action with regard to cartography by the General State Administration, as well as all those Public Administrations that adopt it voluntarily as a model for cooperative action. Its objectives are to:

- a. Ensure the harmonisation of the information produced by the multiple public organisations that form part of it and which concurrently carry out cartographic activities in the national territory, to ensure its coherence, continuity and interoperability.
- b. Favour efficiency in the public expense allocated to cartography and geographic information systems, avoiding dispersion and duplicity of the public resources used and promoting inter-institutional cooperation.
- c. Ensure public availability and updating of the cartographic reference data.
- d. Ensure the quality of official cartographic production and its utility as a public service, facilitating public access to geographic information and favouring the competitiveness of the private cartographic sector.

⁹ Royal Decree 1545/2007, of 23 November, which regulates the National Cartographic System.

One of the mechanisms of which it is composed is the Geographic Information National Infrastructure (INIG), defined as the SDI set that contains all the official geographic information available on national territory, the territorial sea, the neighbouring area, the continental platform and the exclusive economic zone.

4.1.2 The coordination structure

Name and contact information

Coordinating structure supporting the MSCP	
Name of the coordination structure	Secretaría Técnica del Consejo Superior Geográfico (Technical Secretariat of the Geographic High Council)
Contact information:	
Mailing address	Secretaría Técnica del Consejo Superior Geográfico Instituto Geográfico Nacional General Ibañez de Íbero, 3 28003 – Madrid
Telephone number	
Telefax number	
Email address	
Organisation's website URL	http://www.fomento.es/MFOM/LANG_CASTELLANO/DIRECCIONES_GENERALES/ORGANOS_COLEGIADOS/CSG/Secretaria_Tecnica.htm
Contact person	Antonio Rodríguez Pascual
Email address	afrodriguez@fomento.es
Telephone number	+34 91 5979661
Contact person - substitute	Joan Capdevila Subirana
Email address	joan.capdevila@mpr.es
Telephone number	+34 93 5209620
Date and period of mandate	

Role and responsibilities

According to the RD 1545/2007¹⁰, the IGN acts as the Technical Secretariat of the CSG and as coordinator and operator of the INIG, designated IIGE by the LISIGE, and is responsible for the maintenance and management of the geo-portal of this infrastructure via the Internet¹¹, which must link and be able to direct users to the portals and nodes established by the producing agents of geographic information of the General State Administration and to the portals established by the Autonomous Communities and Local Administrations.

Structure of the organisation

According to article 31 of RD 1545/2007, the CSG is formed by

- a. The Plenary Session.
- b. The Permanent Commission.
- c. The Territorial Commission.
- d. The Specialised Commissions.
- e. The Technical Secretariat.

Article 32 defines the composition of the Plenary Session, which is the maximum decision-making body of the CSG and which is formed by the President, a position held by a superior body or director of the Ministry of Infrastructures and Transports, three vice-presidents (Director General of the IGN, Director

¹⁰ Royal Decree 1545/2007, of 23 November, which regulates the National Cartographic System.

¹¹ <http://www.idee.es>

of the Hydrographic Institute of the Navy and Director General of Cadastre), 29 members of the General State Administration, a member for each one of the 17 Autonomous Communities and 6 members representing the Local Authorities. The Permanent Commission has an executive nature and looks at urgent matters or those delegated to it by the Plenary Session. The Territorial Commission enjoys the participation of representatives of the Autonomous Communities and the Local Authorities and its decisions are binding when they refer to cartographic plans and programmes. The Specialised Commissions are bodies for study and proposal regarding the preparation of the decisions of the Permanent Commission and the Plenary Session. Among these it is appropriate to mention the CE IDE, the objective of which is to determine the technical specifications, the calendar and the costs of the IIGE and to constitute the Portal of this Infrastructure¹², and the CENG, the objective of which is to propose standardised criteria for the harmonisation of geographical information in accordance with international standards and fulfilling the principles and specifications in force in the European Union¹³.

Both the abovementioned Royal Decree and the new LISIGE refer to the Executive Board of the IDEE. Article 4.3 of the Law contemplates that this Executive Board should include representation of all the levels of Administration (Local, Regional, National) and experts environmental policies.

4.1.3 Relationship with third parties

The CE IDE, in its meeting of 14 November 2002 constituted the GT IDEE with the objective that the IIGE should integrate the initiatives to establish SDIs of all the Public Administrations and all the interested thematic, professional and economic sectors. It was proposed to adapt the developments to the principles and guidelines for action of the INSPIRE initiative, assuming:

- The analysis of existing geographic information valid for integration in the IDEE and the preparation of a proposal for actions by the Public Administrations to allow completion of the Infrastructure.
- The analysis of the available metadata of geographic information and their accessibility, promoting the establishment of the descriptive databases of the geographic information, as well as the preparation of the proposals for action in this respect.
- The definition of the architecture, rules and technical specifications to be followed for the establishment and integration in the IDEE. Including the analysis of the most appropriate technologies.
- The analysis of the policies on data distribution, licences and prices. Extracting conclusions from this analysis and preparing proposals for action.

The GT IDEE is a technical group, open, formed by representatives and experts of the producers of geographic information, both reference and thematic, at state, regional and local level, in which the University and private sector also participate. This Working Group has held regular meetings, convening three times per year, at which technical presentations are given, Recommendations are agreed and proposed to the CSG for the implementation of SDI in Spain, experiences are exchanged and the evolution of the IDEE project and other regional and local SDIs is shown.

The GT IDEE is currently formed by 344 individuals from 160 organisations¹⁴.

4.1.4 Overview of working practices and procedures

The CE IDE and the GT IDEE meet three times per year. During the 2007-2009 periods nine meetings have taken place¹⁵.

¹² http://www.fomento.es/MFOM/LANG_CASTELLANO/DIRECCIONES_GENERALES/ORGANOS_COLEGIADOS/CSG/Comisiones/comisi_geomatica.htm

¹³ <http://www.csg-cnc.es>

¹⁴ http://www.idee.es/show.do?to=pideep_que_es_grupo.EN

¹⁵ http://www.idee.es/show.do?to=pideep_reuniones.EN

Date	Meeting venue
23/03/2007	Seville
22/06/2007	Madrid
19/10/2007	Santiago de Compostela
15/02/2008	Madrid
13/06/2008	Palma de Mallorca
07/11/2008	Santa Cruz de Tenerife
06/02/2009	Lisbon
21/05/2009	Malaga
04/11/2009	Murcia

Moreover, in the autumn meeting each year the JIDEE is held. In 2007 it was held in Santiago de Compostela (17-19 October)¹⁶, in 2008 in Tenerife (5-7 November)¹⁷ and in 2009 in Murcia (4-6 November)¹⁸. And during the Technical Congress of 2009 it was agreed to transform the JIDEE into JIIDE and to hold the first one in 2010 in Lisbon, jointly between Spain, Portugal and Andorra.

The following Working Sub-Groups of the GT IDEE are currently constituted:

- SGT1. Reference Data and Thematic Data
- SGT2. Metadata
- SGT3. Architecture and Rules
- SGT4. Data Policy
- SGT5. Nomenclature
- SGT6. SDI Observatory
- SGT7. UNSDI Coordination Office
- SGT8. Data catalogue
- SGT9. Legal Security in Territorial Information
- SGT10. Cartographic Heritage in the SDI
- SGT11. Local SDI
- SGT12. Historic Heritage

The results of the Working Sub-Groups are presented in the meetings of the GT IDEE, which may propose them to the CSG for its approval as Recommendations¹⁹.

Furthermore, it is appropriate to emphasise the contributions made by the CENG in the development of harmonised models consistent with the development of the INSPIRE Directive and which ensure the interoperability of data.

4.1.5 Comments on the monitoring and reporting process

Based on the instructions and tools made available by the EC INSPIRE Team, some simplified forms were prepared for the compilation of the data necessary for the calculation of the indicators. The forms included instructions in Spanish. In addition, an example of the IGN was supplied for assistance. All the documents were distributed to the contact points of the GT IDEE in the Autonomous Communities, to

¹⁶ <http://www.ideo.es/resources/presentaciones/JIDEE07/JIDEE.html>

¹⁷ <http://www.ideo.es/resources/presentaciones/JIDEE08/JIDEE.html>

¹⁸ <http://www.ideo.es/resources/presentaciones/JIDEE09/JIDEE.html>

¹⁹ The GT IDEE has a procedure for the preparation of recommendations

<http://www.ideo.es/resources/recomendacionesCSG/Procedimiento_recomendaciones_v1.0.pdf>

the under-secretariats of the Ministries and to other organisations related with geographic information of the General State Administration that form part of the GT IDEE. The distribution was performed by the Directorate General of the IGN on 4 and 5 May, giving 13 May as the deadline for compilation

The data compiled were integrated in the form provided by the EC INSPIRE Team and the corresponding indicators were calculated. The monitoring data were sent on 17 May²⁰.

This report is compiled based on the analysis of the monitoring data and the contributions made by the different persons named on the first page.

In general, the following conditioning factors have been observed during the monitoring and reporting process:

- In some cases, the organisations consulted have reported spatial data sets that are not their responsibility even though they use them.
- There have been several cases in which the replies are not adapted to the format requested, probably because the instructions issued did not cover all the possible replies.
- In many cases the total area over which the organisation has jurisdiction has been confused with the area that the specific spatial data set is going to cover.
- Some inconsistencies have occurred between what is affirmed for the spatial data sets and what is affirmed for the services.
- Some of the errors detected shows that the instructions issued were not complete or not sufficiently clear.

4.2 Quality assurance

4.2.1 Quality assurance procedures

Quality Assessment of the IDEE is still a topic of research and we think there is little experience in this respect. It is too soon to identify good practices in this area. It will therefore be necessary to identify a set of indicators that describe the status of the IDEE and to measure them over time to reach conclusions regarding their evolution. The IDEE has begun a line of work in this respect and the SDI Observatory Working Sub-Group studies the publications, but from the IDEE we do not yet have a project defined at national level in this direction.

We have information on the quality assessment of various components of the IDEE: data, metadata and services.

Quality assurance in the IDEE can be considered at three different levels:

A) Quality of the data set.

The majority of the providers of official data carry out quality controls on the data in a more or less formalised manner. Many of them have a formal QMS implemented and others carry out assessments to measure the quality of the data.

Some examples:

- The ICC has obtained the ISO 9001 certificate for its 1:5,000 Topographical Database.
- PNOA, a collaborative project carried out by the IGN and the Autonomous Community Governments, has a complete and formal definition of the quality controls of the whole productive process.
- SIOSE, a project similar to the above but in the sphere of land cover and use at a scale of 1:25,000, also has a quality assurance system.

²⁰ Document <100517 indicators_INSPIRE_2009_Spain.xls>

B) Quality of metadata

The quality of the metadata and metadata services is controlled informally. Interactive controls are regularly carried out of the metadata catalogues.

C) Quality of services

The SDI Observatory, a working sub-group established by the GT IDEE to monitor the development of SDIs in Spain and to work in other related activities, is studying which service quality indicators are of interest for inclusion in the framework of the Spanish SDIs, included among which are those required within the framework of the INSPIRE initiative.

Many stakeholders are developing applications to determine the quality parameters of the INSPIRE services automatically.

4.2.2 Analysis of quality assurance problems

A) The main problem regarding the quality assurance of the data is its cost. In some cases the geographic information data sets involve an enormous quantity of data, complex production processes and the requirement that they should be extremely up-to-date.

B) Quality parameters have not yet been established to describe the quality of data and services. To date, little attention has been given to filling in the *capabilities* documents appropriately, one of the best sources of service metadata.

C) The quality assurance of services, considering the implementation rules of Inspire regarding quality, is not easy because we do not have a standard measuring procedure.

4.2.3 Measures taken to improve quality assurance

A) QMS and data quality are habitual lines of work in the IGN and in the Regional Cartographic Agencies and in the other data producing organisations. The Spanish IGN has a Strategic Plan that includes a project entitled "Quality" with the objective of implementing the EFQM model. The consensus has been defined between the IGN and the Regional Cartographic Agencies for a common data specification for the topographical databases: the Harmonised Topographic Database (BTA). This specification includes a quality section with parameters of data quality, thresholds, methods and measurements.

B) Few actions have been developed aimed at ensuring the quality of metadata.

C) The GT IDEE has proposed, and obtained, the approval of some recommendations on services and client applications ("Recommendations on WMS services", "Recommendations on geo-portals and viewers") to increase the availability, flexibility and interoperability of those resources. The corresponding control list has been used informally by the experts of the SDI unit of the IGN to verify and inform regarding problems in the existing resources.

A verification and certification process is expected to be formally defined based on this experience.

4.2.4 Quality certification mechanisms

The CNIG, as part of the IGN, has a project, included in the Strategic Plan of the IGN-CNIG, with the objective of becoming incorporated as a certifying authority, able to certify compliance with ISO 19100 standards, OGC standards and adequacy with the recommendations of the CSG proposed by the GT IDEE. Some steps have been completed and now the first main certification process has been established.

5. Functioning and coordination of the infrastructure

5.1 General overview description of the SDI

The LISIGE establishes that the IIGE is formed by all the infrastructures and interoperable geographic information services available on national territory, the territorial sea, the neighbouring area, the continental platform and the exclusive economic zone, generated under the responsibility of the Public Administrations. This definition coincides with that already established in the Royal Decree 1545/2007, of 23 November, which regulates the National Cartographic System, although the difference between them is the change of designation which has changed from INIG to IIGE.

This means a clear backing by the Spanish Public Administrations for the SDIs. An attempt has been made by the CSG to stimulate their deployment via the incorporation of the CE IDE, which has been provided with the GT IDEE as a mechanism to unite all those interested in the SDI paradigm. It is currently formed by 344 individuals who represent 160 organisations, including Spanish public institutions, universities and private companies. The GT IDEE began to work in 2002 and holds three meetings per year, one of them in the framework of the JIDEE congress which takes place every autumn.

Within the GT IDEE up to 12 specific working sub-groups have been created, from which different proposals have been issued, the majority of which have been transformed into recommendations of the CSG that affect the development of the SDI, and it has also served to carry out a detailed monitoring of the implementation of the INSPIRE Directive and how to collaborate with it.

The GT IDEE has served to date as a technical forum where the LISIGE, which transposes the INSPIRE directive into Spanish legislation, has been promoted and discussed.

At the same time, different Autonomous Communities have published legislation and have set up collaboration mechanisms for the development of SDIs²¹. This is the case of:

- Catalonia, where the Spatial Data Infrastructure of Catalonia (IDEC) is established via the Law 16/2005, of 27 December, on geographical information and on the ICC and the Decree 398/2006, of 24 October, which approves the Implementing regulations of the Law 16/2005 and the Decree 62/2010 of 18 May which approves the Cartographic Plan of Catalonia, which includes the basic characteristics of organisation, functioning and use of Geographic Information Infrastructure of Catalonia, and specifically of the IDEC. The IDEC is created for the purpose of facilitating the use and shared access to geographical information on the general principle of non-duplication of data and interoperability.

- Andalusia, whose Decree 141/2006, of 18 July, which regulates cartographical activity in the Autonomous Community of Andalusia, defines the SDI of Andalusia, makes the Cartographic Institute of Andalusia responsible for its coordination and establishes a Cartographic Register in that Community.

- Castile and Leon, which on 4 December 2008 approved the Decree 82/2008 on the regulation of cartography in Castile and Leon, which defines the SDI of that region and assigns its technical management and coordination to the Territorial Information Centre.

- Extremadura, in the Decree 181/2006, of 31 October, which regulates the composition and functions of the Cartographical and Territorial Information Centre of Extremadura (CICTEX), and assigns to it the functions of promoting, maintaining and coordinating a SDI in Extremadura.

Each Autonomous Community has at least one reference geo-portal, which over time are becoming consolidated as essential elements of SDI development in Spain²².

²¹ http://www.idee.es/show.do?to=marco_legal.EN

5.2 INSPIRE Stakeholders

There are 11 Spanish organisations registered in the INSPIRE²³ portal as SDICs and 10 as LMOs.

	SDIC	LMO
General State Administration	4	3
Autonomous Communities	2	3
Other organisations	1	2
Universities	1	0
Companies	3	1

List of SDICs:

- Biodiversity Nature Data Base (Banco de Datos de la Naturaleza)
- EUROPARC (Observatorio de los espacios naturales protegidos del Estado español)
- National Assembly of the Land Cover and Use Information System of Spain (SIOSE)
- Commission on Geographic Norms (National Geographic High Council)
- SDI of Catalonia - network of local authorities
- Navarre Territorial Information System
- Spain Railways SDI at Executive Direction of Circulacion (ADIF)
- GID Universitat Jaume I
- Indra Espacio S.A.
- Euskal Herriko Datu Espazialen Azpiegitura
- Registra, SL

List of LMOs:

- Direccion General para la Biodiversidad
- Spanish Directorate General for Cadastre
- IDEE Working Group of the Commission on SDI (National Geographic High Council (CSG))
- European Land Registry Association (ELRA)
- Comissió de Coordinació Cartogràfica de Catalunya
- Institut Cartografic de Catalunya
- Colegio de Registradores de la Propiedad y Mercantiles de España
- Grupo de Trabajo FEMP-MAP para la EIEL
- Competitiveness and Sustainability Unit, JRC-IPTS

Users

In general, no distinctions are established between users for access to the data and services provided via the SDI. The majority of the interoperable web services published for viewing and discovery are available without any control mechanism, or any charging or registration. The download services may involve some type of control via registration or the acceptance of a licence for use. This means that users are very diverse and little consolidated. In general it can be affirmed that the Administration is the primary user, with the Local Authorities standing out, and then there is a broad set of companies and individual users who use the available services more and more. Since there are no INSPIRE data, there are still no INSPIRE users. The majority of the SDICs and LMOs declare themselves as users.

Data produces

All the levels of Administration that produce data and provide services are publishing their information via interoperable web services, but it cannot yet be assured that the data comply with the INSPIRE Implementing Rules, since the references to Data Specifications are not yet in force. In some cases, such as the Autonomous Communities of Catalonia or Andalusia, they are using the INSPIRE Annexe

²² On http://www.idee.es/show.do?to=pideep_ambito_regional.ES an updated catalogue of existing reference geo-portals is available.

²³ <http://inspire.jrc.ec.europa.eu/>

structure in their cartographic plans as a classification mechanism for the respective data sets in their areas of responsibility.

Service providers

In general lines the data producers themselves are implementing the corresponding services. An important example is the service provided by the Directorate General for Cadastre²⁴.

Coordination mechanisms

In Spain the CSG acts as a mechanism for coordination, via its CE IDE and its GT IDEE, and the IDEE geo-portal is the node of reference that brings it to fruition, cataloguing data and services of the members of the GT IDEE and others of which it has knowledge. Furthermore, the CE NG prepares standardisation and harmonisation criteria following international standards and the implementing rules of the EC. Almost all of the Autonomous Communities also have some coordination mechanism in which the organisations inherent to the governance of the Autonomous Communities and their Local Authorities participate.

5.3 Role of the various stakeholders

The bodies and organisations of the General State Administration and of the Autonomous Communities that are producers of data act as nodes within the IDEE and, in general, are responsible for the publication of the spatial data services that distribute the data they produce.

The organisations responsible for coordination participate by stimulating the publication of spatial data services and offering both a hosting service and technical support, as is the case of the campaigns to stimulate the generation of IDEC metadata, or the recommendation documents for the creation of Map Services or for the development of SDI Geo-portals, prepared within the working sub-groups of the IDEE. These organisations usually compile catalogues of available data and services and publish reference geo-portals to disseminate them. Furthermore, they carry out activities for the dissemination of SDI technologies.

Users are usually a good quality control system of the services provided. At a general level there are two mailing lists hosted in RedIris, where comments are usually posted regarding problems or incorrect functioning of web services: these are the SIG List and the IDEE List.

There are various mashups which benefit from the existence of interoperable data services as a data source: Goolzoom, the hydrocarbons portal of the Ministry of Industry, the Atlas of Ministry of Housing, Wikiloc, Anthos, etc.

5.4 Measures taken to facilitate sharing

- Legislation corresponding to the 2007 - 2009 period.
 - At national level:
 - Law 11/2007 on electronic access to Public Services.
 - Law 37/2007 Re-use of Public Sector Information.
 - Royal Decree 1545/2007, of 23 November, which regulates the SCN.
 - Royal Decree 1071/2007, of 27 July, which regulates the official reference geodesic system in Spain.
 - Ministerial Order FOM/956/2008, of 31 March, which approves the policy for public dissemination of the geographical information generated by the Directorate General of the IGN.
 - LISIGE.
 - At Autonomous Community level:
 - Castile and Leon: Decree 82/2008, of 4 December, on the regulation of cartography in Castile and Leon.

²⁴ <http://www.sedecatastro.gob.es/>

- Foral Community of Navarre: Basic technical rule for the preparation, management and use of geo-referenced information. Version IDENA 03/09.
 - Galicia: Decree 394/2009, of 8 October, which modifies the Decree 148/2003, of 9 January, which creates the Commission for the Coordination of Geographic and Cartographic Information Systems.
- Metadata
 - Technical agreements of data models:
 - NEM²⁵
 - MNE²⁶
 - Software:
 - IME²⁷ : ISO metadata editor prepared by the INTA
 - Metadata Portal²⁸ of LatinGeo
 - CatMEdit²⁹: metadata editor of the GT IDEE prepared by the University of Zaragoza
 - MetaD³⁰ : metadata editor prepared by IDEC
 - Availability of API
 - API of IDEE³¹
 - Cartovisor³² : API provided by the Cartocity project

There are precedents of laws, regulations or decrees regarding geographic information to facilitate the sharing of data and services, prior to the 2007 – 2009 period, such as:

- Law 16/2005 of 27 December, on geographical information and on the Cartographic Institute of Catalonia³³.
- Decree 141/2006, of 18 July, which regulates cartographical activity in the Autonomous Community de Andalusia³⁴.

5.5 Stakeholder cooperation

As a forum for meeting and cooperation, the different stakeholders have the GT IDEE, described in points 4.1.2 and 5.1 of this report. Cooperation takes place at the meetings of the GT IDEE and in the work carried out in each of the Working Sub-Groups:

- SGT1. Reference Data and Thematic Data.
- SGT2. Metadata.
- SGT3. Architecture and Rules.
- SGT4. Data Policy.
- SGT5. Nomenclature.
- SGT6. SDI Observatory.
- SGT7. UNSDI Coordination Office.
- SGT8. Data Catalogue.
- SGT9. Legal Security in Territorial Information.
- SGT10. Cartographic Heritage in the SDI.
- SGT11. Local SDI.
- SGT12. Historic Heritage

²⁵ <http://www.idee.es/resources/recomendacionesCSG/NEM.pdf>

²⁶ http://www.idee.es/resources/recomendacionesCSG/Propuesta_MNE_v1.0.pdf

²⁷ <http://www.crepad.rcanaria.es/metadata/index.htm>

²⁸ <http://metadatos.latingeo.net/>

²⁹ <http://sourceforge.net/projects/catmdedit/>

³⁰ <http://www.geoportal-idec.cat/geoportal/cat/meta-d/>

³¹ http://www.idee.es/show.do?to=pideep_api_IDEE.ES

³² <http://www.cartociudad.es/VisualizadorCartografico/1024/index.htm>

³³ <http://www.idee.es/resources/leyes/Regionales/A04340-04350.pdf>

³⁴ <http://www.idee.es/resources/leyes/Regionales/d1.pdf>

From the GT IDEE the participation and dissemination of the stakeholders is fostered by various measures:

- Publication of the IDEE Blog³⁵
- Bulletin on SDIs³⁶
- IDEE distribution list³⁷
- IDEE *e-learning* Courses³⁸

Emphasis should also be given to the work carried out by the CENG³⁹ as a forum for meeting and cooperation for the study, analysis and modification of the harmonised models in accordance with the regulations on interoperability of data and services.

5.6 Access to services through the INSPIRE Geoportal

In general a high rate of usage of the services of the INSPIRE Geo-portal by users of the IIGE is not noticed. The geo-portal is considered to be the implementation of catalogue references, viewer and editor of metadata and it is usually assessed as an example by those who are interested in the implementation of a geo-portal. Moreover, it also serves as a test to verify the functioning of the web services.

³⁵ <http://blog-idee.blogspot.com>

³⁶ http://www.ideo.es/show.do?to=Sobre_IDEs.EN

³⁷ http://www.ideo.es/show.do?to=pideep_Lista_Distribucion.EN

³⁸ http://ign.go-learning.net/file.php/1/Cartel_IDEE_Conv1_2010.pdf

³⁹ <http://www.csg-cnc.es>

6. Usage of the infrastructure for spatial information

6.1 Use of spatial data services in the SDI

Until this report there has been no systematic monitoring of the use of the spatial services of the SDI in Spain. Monitoring activity can only be quoted during the 2007-2009 period by the IDEC, which reflects the use of the services of the IDEC geo-portal and the viewer developed to provide service to the Administration⁴⁰.

However some of the organisations of the IDEE have monitoring mechanisms. This is the case of the Directorate General for Cadastre, which has a series of quantitative indicators that provide knowledge on a daily basis of the evolution in the use of the services of the Cadastral Electronic Site.

The 2009 monitoring campaign to comply with Decision 2009/442/EC of the Commission, of 5 June, implementing Directive 2007/2/EC of the European Parliament and of the Council as regards monitoring and reporting, described in section 4.1.3, provides some of the first useful information, although it is necessary to take into account the limitations deriving from the circumstances described in section 4.1.3.

The use of network services is accounted for via the general indicator NSi3, which summarises the result of five specific indicators: NSi3.1 for discovery services, NSi3.2 for viewing services, NSi3.3 for download services, NSi3.4 for transformation services and NSi3.5 for access services. Each indicator is the average of the accesses counted per number of services in each type. The general indicator indicates that the annual number of requests per network service is 3,167,833.

The number of network services of the 19 institutions that have responded is 211 in total, of which 21 correspond to discovery services, 148 to viewing services, 35 to download services, 3 to transformation services and 4 to access services.

The annual number of requests for all the network services has been 668,412,840, of which 661,999,274 correspond to requests for viewing services, 192,540 to discovery services, 6,209,990 download requests and 11,036 requests for all the transformation services. At the date of the report no requests are recorded for the access services.

<i>NSi 3.1</i>	<i>NSi 3.2</i>	<i>NSi 3.3</i>	<i>NSi 3.4</i>	<i>NSi 3.5</i>	<i>NSi 3</i>
9,169	4,472,968	177,428	3,679	0	3,167,833

Monitoring indicators for the use of the network services referred to in article 11, section 1 of Directive 2007/2/EC.

6.2 Use of spatial data sets

Spatial data sets are becoming more and more widely used in the context of new thematic or specific geo-portals of the Administrations. For example, in the case of the Electronic Headquarters of the Cadastre an average of 2,200,000 accesses to the cadastral cartography are counted per week.

They are also integrated in mash up projects. There is no globally recognised indicator that measures this point, but some examples can be pointed out:

⁴⁰ <http://www.geoportal-idec.cat/geoportal/eng/que-es/evolucion/>

- The Urban Information System (SIU)⁴¹ of the Ministry of Housing, which collects information on land and urban development in Spain which it publishes via the Internet with the collaboration of institutions at national, autonomous community and local level. The central element of the SIU is the viewer, the main access tool to the information stored in the SIU database. This system is based on rules and standards promulgated by the national and international scientific community regarding geographical information and technologies associated with the Internet
- SDI Geo-portal of the Sustainability Observatory⁴², the objective of which is to make geo-referenced information available to users via the Internet regarding socio-economic, environmental, cultural, territorial and governance aspects which allow assessment of the sustainability of Spanish development.
- SIGMAPA Geo-portal⁴³. The main objective of the Geographical Information System for Agriculture, Fisheries and Food, SIGMAPA, is the publication and dissemination of the geographical information relative to this thematic. The information published is very varied and covers different types of disciplines: irrigation, crop maps, agriculture, agro-climatic data, designations of origin, management of grants, hydrographic basins, general cartography, etc. SIGMAPA uses the data sets of other public organisations via OGC (WMS) standards.
- BDB Geo-portal⁴⁴, the Geo-portal of the Biodiversity Data Base allows the viewing and consultation of information regarding protected Natural Spaces, Wetlands, Red Natura 2000, National Soil Erosion Inventory (vector and image), Forestry Map of Spain, Biosphere Reserves, Drovers' Roads, Specially Protected Areas of Mediterranean Importance (SPAMI), Ownership of Scrub Land and Important Bird Areas (IBAs).
- SIA Geo-portal⁴⁵, via the Integrated System for Information on Water all the information related with water is viewed and consulted in a homogenous manner.
- The Cadastral Electronic Site⁴⁶, allows users to integrate cadastral cartography "on line" with other layers of other organisations, such as SIGPAC cartography, IGN cartography, census sections and districts (INE), orthophotos, urban development plans, administrative boundaries and many others; also providing to the users of other public administrations cartographic information on which to trace their own policies (urban development, infrastructures, expropriations, grants etc).
- Geo-portal of IDEC-Litoral⁴⁷: Spatial Data Infrastructure for the Catalanian Coast, its objective is to improve and increase access to existing information for the whole user community, so that their participation in coastal management may be more active and documented. Therefore, IDEC-Litoral allows users to know and access the information relative to the coast.
- The SIMA⁴⁸, Interactive Environmental Map Service has as its main objective the preparation and consultation of maps of any area of Catalonia with the environmental information required by each user. A second objective is the standardisation of the symbols used in Catalonia on environmental maps. The third objective is to guarantee access to geo-referenced environmental data on the Internet via OGC standards.
- PLANEA⁴⁹: the Department of the Environment, Housing and Regional Planning of the Community of Madrid places at the disposal of the citizen an information system comprised of a

⁴¹ <http://siu.vivienda.es>

⁴² <http://www.sostenibilidad-es.org/Observatorio+Sostenibilidad/esp/IDE/>

⁴³ <http://sig.mapa.es>

⁴⁴ http://www.mma.es/portal/secciones/biodiversidad/banco_datos/index.htm

⁴⁵ <http://servicios3.mma.es/siagua/consultas/servlet/consultas.GlobalFilter?tipo=masiva&sid=generate>

⁴⁶ <https://www1.sedecatastro.gob.es/OVCFrames.aspx?TIPO=CONSULTA>

⁴⁷ <http://www.geoportal-idec.cat/idecostes/index.jsp>

⁴⁸ <http://sima.gencat.net/website/sima/viewer.htm>

⁴⁹ <http://www.madrid.org/cartografia/planea/index.htm>

series of computerised and graphic databases, which bring together a considerable volume of information in the field of cartography and territorial documentation, specifically urban planning. It is an interactive viewer where the user can view the territory with different aspects or link to any type of geo-referenced information. A module has been developed for the provision of WMS services, as well as for the presentation of Metadata, so that the whole thing (Planea + WMS services + metadata) will form the SDI of Madrid, with a page linking to the SDI of Spain, its implementation exclusively pending administrative permits.

- Geo-portal of drought and water resources of the Region of Murcia⁵⁰, which arose as a contribution to the Regional SDI of Murcia, to provide the technicians of this Administration with an integrated infrastructure, based on the services accessible from the Internet, for consultation regarding climatic risks, drought and desertification processes, and to serve moreover as a tool for decision-making.
- GeoEuskadi⁵¹ is a web portal promoted by the Department of the Environment, Territorial Planning, Agriculture and Fishing of the Basque Government, to provide and facilitate access to all the resources related with the territorial information of the Autonomous Community of Euskadi.
- Geo-portal of IDEC-Local⁵²: this is an initiative of the AOC with the objective of creating a specific network of map servers with geo-information of the Local Administrations; to have available a set of services for these Administrations so that they may benefit to the full from accessibility to the geo-information and services facilitated by the IDEC and place within reach of all Administrations a platform of geo-information resources, with data, services and applications accessible via the Internet.
- Local SDI of the Province of Barcelona⁵³, where it is possible to find maps and innovative responses in the provision of services for the management and planning of the municipal territory, fostering networking in order to ensure efficiency and the optimisation of resources to contribute in this way to territorial balance, transparency and participation.

6.3 Use of the SDI by the general public

Data are not available regarding the use of the SDI by the general public beyond the data reported on the use of services and the work performed by the IDEC already commented in point 6.1.

However, some organisations such as the Directorate General for Cadastre have been able to observe via their indicators of use the spectacular increase in accesses to the Electronic Headquarters of the Cadastre which has risen from 270,000 visitors in 2003 to 20,800,000 in 2009, with more than 124,085,097 accesses to cadastral cartography in 2009.

Furthermore the Spanish Cadastre has been chosen by the *INSPIRE Data and Service Sharing Drafting Team* as “good practice” in public access and it thus includes it in the document on good practices that it has just published⁵⁴.

Some specific projects exist that use interoperable web services and which can be considered as satisfying a specific demand, but indicators of activity are not available in many cases, except those commented. Some examples are:

- Petrol Stations Geo-portal of the Ministry of Industry, Tourism and Trade⁵⁵, which allows viewing and searching of geo-referenced Service Stations in the Spanish geography. For this it uses standard OGC technologies: WMS and Web Feature Service (WFS).

⁵⁰ <http://sigyt.imida.es/website/agua/viewer.htm>

⁵¹ <http://www.geo.euskadi.net/s69-15375/es/>

⁵² <http://www.geoportal-idec.cat/idelocal/cat/que-es/idec-local/>

⁵³ <http://www.diba.cat/cartosig/>

⁵⁴ <http://inspire.jrc.ec.europa.eu/index.cfm/pageid/62>

- National System of Cartography of Floodable Areas⁵⁶. Geographic viewer that serves as an instrument of support in the management of fluvial spaces, risk prevention, territorial planning and administrative transparency.
- SIGA⁵⁷. The Information System for Agricultural Data offers a complete navigation system for the whole national territory, placing at the disposal of the citizen in easy and intuitive manner complete and detailed visual information on agricultural data.
- Geographical Food Locator⁵⁸. Allows consultation of an interactive map that contains geo-referenced information for each type of Food Product or Family related with Designations of Origin and Agri-food Industries.
- SAIH Viewer⁵⁹. The Automatic Hydrological Information System collects data in real time relative to the hydrological and hydraulic condition of the basin. These data can be viewed and consulted via the geographical viewer.
- MICODATA⁶⁰. Viewer dedicated to the study of the sustainable exploitation of edible fungi in Castile and Leon.
- PORTAL MAYORES⁶¹. Geo-portal of information on social resources for elderly people in Spain.
- IDEZAM⁶². Infrastructure for Spatial Data of the Archaeological Zone of Las Médulas.
- Toledo: space and time⁶³. Portal of urban development information on the city of Toledo in the Middle Ages.
- GoolZoom⁶⁴ is a mashup which merges Google Maps with the Spanish Cadastre, SigPac as well as other maps of a public nature, with the aim of unifying and simplifying access to territorial information.
- Wikiloc⁶⁵. The aim of Wikiloc is to help to share and find GPS *tracks* and *waypoints* to practise open-air activities in any part of the world, in a simple manner.

6.4 Cross-border usage

Agreements have been reached between the IGN, the Institut Géographique National of France, the Portuguese National Geographic and the Àrea de Cartografia d'Andorra so that the map services considered to be of reference can be discovered and viewed correctly from the IDEE geo-portal.

Furthermore, there has been participation in different projects of a cross-border nature.

⁵⁵ <http://geoportal.mityc.es/hidrocarburos/eess/>

⁵⁶ <http://sig.marm.es/snczi/>

⁵⁷ <http://sig.marm.es/siga/>

⁵⁸ <http://sig.mapa.es/alimentacion/>

⁵⁹ <http://servicios2.mma.es/saihs-web/index.htm>

⁶⁰ <http://admin.micodata.es/MicodataWEB/index.html>

⁶¹ <http://www.sigmayores.csic.es/visor/inicio.htm>

⁶² <http://www.idezam.es>

⁶³ http://www.toledohistorico.es/espacio_y_tiempo.html

⁶⁴ <http://www.goolzoom.com/>

⁶⁵ <http://es.wikiloc.com/wikiloc/home.do>

- EURADIN⁶⁶. Its objective is to create a network to promote the harmonisation of European Addresses, concentrating attention on the form of access to existing information and the manner of making it interoperable, as well as defining strategies to implement access services for the infrastructures of national and regional addresses.
- OTALEX⁶⁷. Territorial Observatory Alentejo (Portugal) Extremadura (Spain). This project has implemented a cross-border SDI, IDE OTALEX, which enhances the harmonisation of data and indicators on both sides of the border and allows performance of geo-processing for a better and greater analysis of the alterations caused to the territory by natural phenomena or those deriving from human activity.
- IDE Univers⁶⁸ is a SDI to invigorate the access, exchange and interoperability of the large quantity of geo-referenced information produced in universities and research centres via their projects.
- SIGN II Project ⁶⁹. Infrastructure for Spatial Data for the rural territory of Galicia-North of Portugal.
- GIS4EU⁷⁰ The objective of the project is to provide a cartographic data set of Europe on the following themes: administrative units, hydrograph, transportation networks, elevations. Furthermore GIS4EU proposes developing a common data model to allow access to homogeneous and consistent data provided by cartographic authorities of different countries and levels (national, regional and local).
- ESDIN⁷¹ is a bridge between the theory and the practice of the INSPIRE Directive in the sharing and use of interoperable geographical data. It is also a discussion platform of experts for best practice networking within the SDI, the creation of communities and initiatives.

6.5 Use of transformation services

Various examples of transformation systems are available:

- WCTS of the IDEE⁷². Web Service that allows users to transform the coordinates of geometric elements, given in GML format, from one Reference System to another.
- IDEC GeoServeis SOAP⁷³. This is a SOAP geo-service for searching for place names and other functionalities offered by IDEC.
- WPS of the IDEC Support Centre⁷⁴. Service intended for the transformation of coordinates of GML entities based on EPSG codes.
- WPS of the Universitat Jaume I (UJI)⁷⁵. Service intended for the transformation of coordinates of GML entities based on EPSG codes, offered by the IDEC.

Furthermore, various services have also been implemented that support the definition of styles or SLD.

⁶⁶ <https://www.euradin.eu/default.aspx>

⁶⁷ <http://www.ideotalex.eu/>

⁶⁸ <http://www.ideunivers.eu/ideunivers/global.jsp?lang=es>

⁶⁹ <http://www.proyectosign.org/index.asp?ididioma=1&t=1&st=1>

⁷⁰ <http://www.gis4eu.eu/default.asp?l=5>

⁷¹ <http://www.esdin.eu/>

⁷² Address of the service: <http://www.idee.es/IDEE-WCTS/ogcwebservice>

⁷³ Consultation made in the IDEC catalogue:

http://delta.icc.cat/SDIExplorer/cercaCataleg.jsp?lang=en_UK address of the service:

http://www.geoportal-idec.net/gestor/webservices/idec_ws.php?wsdl

⁷⁴ <http://delta.icc.cat/webservices/wps.html>

⁷⁵ <http://www.geoinfo.uji.es/demos.html>

Data regarding their use are not available.

7. Data sharing arrangements

7.1 Data sharing arrangements between public authorities

The Royal Decree 1545/2007, of 23 November, which regulates the National Cartographic System, established the legal framework for collaboration between the public authorities with regard to the regulation of cartographic production, cooperation in the production and harmonisation of data and geographic information and the exchange of data between them. But the Royal Decree 1545/2007 was the regulatory formula for consolidating the work of collaboration between the public authorities that had been under development since the year 2004 promoted and supported by the CSG.

A result of this collaboration and of the work on cooperation was the Ministerial Order FOM/956/2008, of 31 March, which approved the policy for public dissemination of the geographical information generated by the Directorate General of the IGN. This Order made freely available, free of charge, all the information included in the National Reference Geographic Equipment and other information, for non-commercial use, free of charge but via the acceptance of the conditions established in a licence for use. It also establishes the conditions for commercial use of the geographic information, encouraging the development of added value services regarding the geographic information, the only requirement as regards an economic consideration being a percentage of the profits that the provider obtains for the provision of the added value services. In its article 5 it mentions that:

“1 - The IGN and the CNIG will maintain specialised services, via the Internet, for the availability, analysis and processing on line both of the digital geographical information produced by the IGN and of the geographic information services aimed at the Public Administrations.

2 – To this effect, it will make available the necessary resources to ensure the availability of the same to the different units of the General State Administration and of the Autonomous Community and Local Administrations.”

Furthermore, the existence of the geo-portals made available by the data producers and the service providers, the majority of public origin, can be considered as a mechanism for the sharing of data, both between authorities and among the public in general (see comment in 5.2, Data Producers section).

There are various projects for the harmonisation of data:

- Concise Geographic Gazetteer of Spain⁷⁶.
- CartoCiudad Project⁷⁷.
- PNOA⁷⁸.
- SIOSE Project⁷⁹.
- BTA prepared by the CENG⁸⁰ of the CSG.
- Collaboration agreement between the FEAGA⁸¹ and the Directorate General for Cadastre for the attainment of a common cartographic layer of plots for the SIGPAC and the cadastral GIS.

⁷⁶ http://www.ideo.es/show.do?to=pideep_conciso.ES

⁷⁷ <http://www.cartociudad.es/visor/>

⁷⁸ <http://pnoa.wordpress.com/>

⁷⁹ <http://www.ign.es/siose/>

⁸⁰ <http://www.csg-cnc.es>

⁸¹ <http://www.fega.es>

7.2 Data sharing arrangements between public authorities and Community institutions and bodies

Spain participates in various projects for data sharing at European Community level:

- EUREF⁸², is the sub-commission of the International Geodesic Association for the definition, realisation and maintenance of the European geodesic reference frame ETRS89, already officially assumed in Spain⁸³.
- EURADIN⁸⁴ (European Address Infrastructure), a project that aims to promote the harmonisation of European addresses by proposing the definition, registration and access to European address data.
- CORINE⁸⁵ (Coordination of Information on the Environment) Land Cover develops the creation of a database on land cover and use in the European Union.
- SIGPAC⁸⁶, Spanish GIS for the application of the LPSI of the Common European Policy.
- GIS4EU⁸⁷. Provides a cartographic data set of Europe on the following topics: administrative units, hydrography, transportation networks, and elevations.
- Projects promoted by EuroGeographics:
 - EuroGeoNames (EGN)⁸⁸. Provides a network of data of multilingual geographical names distributed in Europe.
 - EuroGlobalMap⁸⁹. This is a topographical data set compiled at a scale of 1:1 Million and which covers 32 countries or data sets.
 - EuroRegionalMap⁹⁰. Aims to create a pan-European vector topographic database at a scale of 1:250,000 (average scale) that can be used as a reference database and which allows spatial analysis, based on the harmonisation of the National Databases that already exist in European National Cartographic Agencies.
 - State Boundaries of Europe (SBE)⁹¹. Aims to compile a multi-purpose data set of European state borders, in order to be able to consider the “definitive” description of the national borders of the European countries.
 - ESDIN⁹². Discussion platform of experts for best practices and sharing and use of interoperable geographical data.

⁸² <http://www.euref-iag.net/>

⁸³ Royal Decree 1071/2007, of 27 July, which regulates the official reference geodesic system in Spain.

⁸⁴ <https://www.euradin.eu/default.aspx>

⁸⁵

http://www.fomento.es/MFOM/LANG_CASTELLANO/DIRECCIONES_GENERALES/INSTITUTO_GEOGRAFICO/Teledeteccion/corine/

⁸⁶ <http://sigpac.mapa.es/feqa/visor/>

⁸⁷ <http://www.gis4eu.eu/default.asp?l=5>

⁸⁸ <http://www.eurogeographics.org/eurogeonames>

⁸⁹ <http://www.eurogeographics.org/content/euroglobalmap>

⁹⁰ <http://www.eurogeographics.org/content/euroregionalmap-0>

⁹¹ <http://www.eurogeographics.org/sbe>

⁹² <http://www.esdin.eu/>

Furthermore, in the particular case of the geographical information considered in the Ministerial Order FOM/956/2008, of 31 March, which approves the policy for the public dissemination of the geographical information generated by the Directorate General of the IGN, the access and use of the geographical information considered in this Order by the institutions and bodies of the European Community is free of charge, provided that its use is not commercial, although subject to the establishment of the corresponding licence for use. Also free of charge is access by the Commission to all the Cadastral Information via the Electronic Headquarters of the Cadastre. The information is available both in the official languages of the Spanish state and in English.

7.3 Barriers to sharing and the actions taken to overcome them

In Spain the distribution of attributions between the State and the Autonomous Communities on the subject of cartography has been firmly established by the constitutional case law included in the Constitutional Court Ruling 76/84 by signalling the instrumental nature of cartographic activity in relationship with multiple activities of individuals and of the Public Administrations, which means that it is not necessary to hold a specific competence in order for a body belonging to any Public Administration, whether State or Autonomous Community, to carry out a cartographic activity. This is no obstacle to the fact that, as the Constitutional Court points out, these cartographic activities of bodies belonging to the Autonomous Community or Local Administrations “should be performed in accordance with state rules that ensure technical unity and coordination”.

This gave rise to an ample production of geographic information, in many cases duplicated, and produced in accordance with different rules and specifications.

This production, of an instrumental nature, for the purpose of resolving specific problems, without considering the needs of other public authorities, together with an unfounded sense of heritage and the establishment of economic considerations to facilitate access to the information, gave rise to serious difficulties for the use of the geographic information by authorities other than those responsible for its production.

Aware of this serious problem and considering the principles established by the INSPIRE initiative, as well as the fact that the future INSPIRE Directive would mandate compliance with the said principles, the bodies and organisations of the Public Administrations, both of the General State Administration and of the Autonomous Community Administrations, decided from 2003 to carry out various actions to achieve the sharing of geographical data, optimising and completing its production and coordinating their actions to avoid duplications.

The adequate forum to establish the policy of production and access to the data, and the rules and specifications to which these should be adapted for shared use, was the CSG as a consultative body that includes all the producers of geographical information of the public sector and which has as its objective the coordination of the Public Administrations on the subject of geographical information. Furthermore, the CSG could coordinate the legislative development to regulate the policy for production and access to the data, and the rules and specifications.

To date, this coordinated action by the CSG has been embodied in various national action programmes, in the adoption of different rules for geographical information and in the development of a legal framework formed by the Royal Decree 1545/2007, of 23 November, which regulates the SCN and by the LISIGE approved by the Cortes Generales (Spanish Parliament) on 17 June 2010.

A case of success of the programmes to which we refer is the activity of the Cases Working Group of the CE NG, to define a protocol for action and the methods to be used to resolve the problems of case between the territorial blocks of the BTA⁹³.

⁹³ <http://www.csg-cnc.es>

These actions should culminate with the designation and constitution of the Executive Board of the IIGE, as a body contemplated both in the Royal Decree 1545/2007 and in the LISIGE, which will have to control and manage the IIGE, and its management by the Directorate General of the IGN as the Technical Secretariat of the CSG, as well as to formulate to the competent authorities proposals on the policy of transfer, distribution and dissemination of the information. There is a firm commitment for this to be operational during 2010.

On the other hand, the Fourth Additional Provision (Plan of Measures) of the LISIGE, with regard to the development and implementation of the infrastructures for geographical information in Spain, and with the implementation of INSPIRE, establishes that in the term of six months from the entry into force of this law, the CSG will prepare a Plan of Measures for its implementation by the Public Administrations, in accordance with the principles of coordination, efficacy, efficiency and austerity in public expense. The said Plan will include the forecasts of means, the implementation periods and the regular assessment systems that may be considered necessary.

This does not mean that to date means and resources have not been dedicated to the development and implementation of the infrastructures for geographical information by the Spanish Administrations. On the contrary, the General State Administration, the Autonomous Community Administrations and even the Local Administrations understood the importance of facilitating access by institutions, companies and individuals to the information and geographical services in an interoperable manner, and in this respect they have developed and implemented the adequate information systems, via the opening of the adequate interoperable geographical information services and, in some cases, of the geo-portals that facilitate access to them.

In the IGN alone the development and operation of the IIGE Geo-portal⁹⁴ has represented an investment of around €1,300,000 per year, during the last 5 years.

⁹⁴ <http://www.ideo.es>

8. Cost / benefit aspects

8.1 Costs resulting from implementing the INSPIRE Directive

There are no studies that assess the cost of application of the INSPIRE Directive. Neither is there more general studies evaluating the cost/benefit impact of the development of SDIs at national level.

However, in the costs deriving from the application of the INSPIRE Directive which are being produced in the Spanish Public Administrations it is possible to distinguish different cost groups and the ways in which these are assumed by the public institutions.

- Costs of transforming the geographical information to adapt it to the data specifications established by the INSPIRE implementing rules, and costs of generation and maintenance of metadata:
 - Each institution of the Public Administrations assumes, with its own budget, its costs for the transformation of data and generation of metadata
- Costs of harmonisation of the geographical information:
 - In the projects of harmonisation or joint production, both bilateral and multilateral, costs are shared between the institutions participating in the project. Each project has its own formulas for sharing costs, but in the projects between the General State Administration and Autonomous Community Administrations, in general, the costs are shared at 66% General State Administration and 34% Autonomous Community Administrations.
 - In other cases, when the project does not involve other Administrations, the cost falls completely upon the data producer, as for example when an Autonomous Community integrates the BTA model in its production chain.
- Costs of implementation and operation of interoperable geographical information services:
 - the costs are assumed by the institutions that provide the interoperable services.
- Costs of implementation and operation of the SDI Geo-portals:
 - the costs are assumed respectively by the budgets of the State Administration, the Autonomous Communities and the Local Authorities, which establish the corresponding geo-portals.
- Costs of implementation and maintenance of the IIGE Geo-portal⁹⁵:
 - the cost is assumed with the corresponding budget of the IGN, in the General Budget of the Spanish State, as Technical Secretariat of the CSG. This cost has amounted to an average of €1,300,000 per year, during the last 5 years.

At the regional level it is appropriate to highlight the socio-economic impact study of the IDEC performed in 2007⁹⁶. This study has contributed to the work related with the assessment of the development and impact of the SDIs of regional scope, since it considers that it is the most appropriate scope in which to implement them⁹⁷. The study evaluates the cost of operating and developing the infrastructure in the 2004-2006 periods at €283,000 / year. The main concept in this expense is that of human resources, which represents 91% of the total. This result does not include either the costs deriving from maintaining the reference data or the technological and physical infrastructure expenses, both provided by the ICC. They contemplate the creation and maintenance of metadata, the

⁹⁵ <http://www.idee.es>

⁹⁶ Garcia Almirall P, Moix Bergadà M, Queraltò Ros P. 2008. "The socio-economic impact of the Spatial Data Infrastructure of Catalonia". Luxembourg: OPOCE. [http://ies.jrc.ec.europa.eu/uploads/fileadmin/Documentation/Reports/Spatial_Data_infrastructures/EUR_2006-2007/EUR_23300_EN.pdf]

⁹⁷ Craglia M, Campagna M (2009) "Advanced Regional SDIs in Europe: comparative cost-benefit evaluation and impact assessment perspectives". *International Journal of Spatial Data Infrastructures Research*, under review. [<http://ijsdir.jrc.ec.europa.eu/index.php/ijsdir/article/viewFile/166/196>]

development of geo-services (including the IDEC geo-portal and WMS client), preparation of the data for publication, applications, hardware and software, and management.

8.2 Benefits observed

As has already been stated, there are no studies that evaluate the cost of application of the INSPIRE Directive or more general studies that assess the cost/benefit impact of the development of the SDIs at national level.

An example to be highlighted is the Cadastre, the main data provider of the IDEE, in a recent study prepared by the Presidency of the Spanish Government⁹⁸, in which the economic impact caused by the application of a series of measures established to reduce the administrative load was measured in monetary terms. The saving produced for citizens and companies by being able to obtain cadastral information via the Internet was valued at 157 million euros; a quantity far higher than the annual budget of the Directorate General for Cadastre.

At the regional level it is appropriate to highlight the abovementioned study of the socio-economic impact of the IDEC performed in 2007. Based on the surveys conducted it is concluded that the main benefits of the IDEC take place at the level of Local Administration in the form of benefits in internal efficiency (time saved in internal consultations made by technical personnel, time saved attending to consultations made by the public, time saved in internal processes) and benefit with regard to efficiency (time saved by the public and companies in their relationships with the Public Administration). Extrapolating, it is estimated that for all the local authorities the saving in internal efficiency is some 500 hours per month, corresponding to some €2,600,000 per year.

Other socio-economic benefits were identified but not quantified. One of the most important benefits is the contribution of the IDEC to reducing the digital breach between small municipalities and other much larger ones. The effects can also be emphasised of the Administration-citizen interaction based on some of these services. In the negative sense, it appears that the use of SDIs has no effect on internal coordination between units.

⁹⁸ Project "Medición de las cargas administrativas de 78 iniciativas de vía rápida de reducción de cargas en el ámbito del Plan de Acción para la Reducción de Cargas Administrativas. Informe Final. Diciembre de 2009", Report prepared by the company KPMG Asesores, S.L.

9. Conclusions

- First report. Doubts, errors and delays have occurred in the preparation of the information as a consequence of the lack of organisational experience and practical knowledge of how to complete the report. On the positive side, this report has served to coordinate organisationally the flow of information from the different SDI nodes and geo-portals that exist in Spain towards INSPIRE.
- Initial deployment phase of INSPIRE. This first control and report will surely show how to improve the inventories and template for compiling the said information.
- Materialisation process of the legal framework in Spain: LISIGE. The implementation period of the INSPIRE Directive considered in the report has coincided with the time necessary to carry out the transposition of the Directive in Spain, via the LISIGE, a process which is complex and long, owing to the implication of the Public Administrations in Spain.
- New coordination structures of an executive nature are expected: Executive Board of the IIGE. Indeed, the LISIGE, and previously the Royal Decree 1545/2007, also includes the organisational bases for developing the implementation of the Inspire Directive, giving responsibility to a specific body, the Executive Board of the IIGE, for the task of coordinating and directing the said development.
- Pending strategic and implementation planning. Even though the CSG, via its CE IDE and its GT IDEE, have promoted a spectacular development of SDIs in Spain, there was no specific mandate that mandate all the Administrations to define and follow strategic planning, and moreover the absence of the implementing rules of the Directive influenced the difficulty in adopting common standards and specifications. The first problem has been overcome in the LISIGE itself, the second is solved by the approval of the Implementing Rules of Inspire.
- Important deployment of the SDIs based on a participative process stimulated by the Administrations. The task of promotion and coordination carried out by the CSG, via its CE IDE and its GT IDEE, has given rise to a dynamism of participation, stimulated by the Public Administrations of all sectors, State, Autonomous Community and Local, the academic and research sector and the business and professional sector. All of these sectors have participated in the development of the SDIs in Spain via the GT IDEE.
- Good participation by Spanish experts in the definition process of INSPIRE. From the beginning, both in the definition and development process of the Inspire initiative and that of the subsequent Directive and in the establishment of the implementing rules that regulate it, there has been an active participation by experts proposed by Spanish institutions.
- The interest awoken both by the SDIs and the INSPIRE initiative in all spheres is to be emphasised.
- Considerable public usage of the SDIs and increasing social utility.
- It is necessary to design instruments to improve the monitoring and development of the SDIs in Spain in order, among other things, to comply better with the INSPIRE implementing rules.

10. Annexes

10.1 List of organisations – names and contact details

10.1.1 General State Administration

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Organisation:	Ministerio de Medio Ambiente y Medio Rural y Marino Dirección General del Medio Natural y Política Forestal (Ministry of the Environment and Rural and Marine Affairs. Directorate General of the Natural Environment and Forestry Policy)
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Organisation:	Ministerio de Medio Ambiente y Medio Rural y Marino Confederación Hidrográfica del Ebro (Ministry of the Environment and Rural and Marine Affairs. Hydrographic Confederation of the Ebro)
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Organisation:	Ministerio de Medio Ambiente y Medio Rural y Marino Confederación Hidrográfica del Guadiana (Ministry of the Environment and Rural and Marine Affairs. Hydrographic Confederation of the Guadiana)
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Organisation:	Ministerio de Fomento Instituto Geográfico Nacional (Ministry of Public Works and Transport. National Geographic Institute)
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10.1.2 Autonomous Communities

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10.2 List of references for the compilation of the report

Each reference used has been noted at the foot of the page where quoted