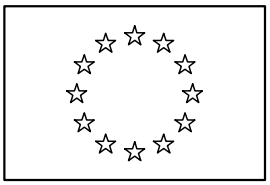

Spatial Data Infrastructures in Europe: State of play 2007

Summary report of a study commissioned by the EC (EUROSTAT) in the framework of the INSPIRE initiative

(Under Framework Contract REGIO/G4-2002-02-Lot 2)

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SPATIAL APPLICATIONS DIVISION
K.U.LEUVEN RESEARCH & DEVELOPMENT

Celestijnenlaan 200 E, BE-3001 LEUVEN
TEL.: 32 16 32 97 32 FAX: 32 16 32 97 24
URL: http://www.sadl.kuleuven.be

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1. EXECUTIVE SUMMARY

The INSPIRE State of Play study, initiated in 2002, takes place for the fifth consecutive year. The update for 2007 took place in an important year. Directive 2007/2/EC of the European Parliament and of the Council of 14 March 2007 establishing an Infrastructure for Spatial Information in the European Community (INSPIRE) was published in the Official Journal of the EU on 25 April 2007. The Directive entered into force on 15 May 2007. Member States have 2 years to transpose the Directive into national legislation.

As for other years, the objective was to describe, analyse and assess the status of the (N)SDI of 32 countries in Europe: 27 Member States, 4 EFTA countries and 1 Candidate Country. In 2006, the methodology was reviewed in order to bring it more in line with the INSPIRE Directive. Even if the methodology was shifted in 2006, the overall approach remained the same, i.e. to identify and describe the major (N)SDI initiatives in Europe. The reporting was streamlined to bring the terminology in line with INSPIRE and the indicators were reviewed to (partially) reflect the work of the Drafting Team on monitoring and reporting (DT MR). However, the new approach was only partially tested. In the 2007 update additional information was collected to do further testing.

Beginning of 2008, the DT MR reviewed the list of indicators based on the comments from the other Drafting Teams and the European Commission. After many discussions and versions of the list, it was decided to propose a shortened list of indicators to monitor the status and use of the infrastructure. Data sharing and coordination/cooperation was not included anymore in the monitoring part, but in the reporting part. The current update of the State of Play takes the recent developments to a certain extent into consideration.

For the 2007 update, we worked in several steps: (1) the reviewed methodology was fine-tuned; (2) a survey was set-up to collect information on the status of the infrastructure, its use, and on data sharing practices; (3) country reports were updated; (4) the reviewed approach was tested and (5) the situation in Europe was assessed and a summary report elaborated.

The survey itself focused on 5 topics: (1) collection of information regarding data sets to be considered part of the INSPIRE infrastructure, the existence of metadata and the accessibility of data sets; (2) collection of information regarding network services to be considered part of the INSPIRE infrastructure, including its type, existence of metadata, …; (3) information on the use of the infrastructure; (4) information on the benefits of the NSDI and (5) information on data sharing issues and practices. All 32 countries were invited to participate in the survey: 21 provided information using the survey templates, while another 2 countries gave input in a different way.

From the survey we can learn different things:

Regarding the data sets and services:

- Several countries succeeded in filling in the information regarding data sets and services, while others provided incomplete information, especially when it comes to the description of the data sets for Annex III.
- Information was gathered on 1384 unique data sets (1635 data sets reported under the different themes of annex I, II and III) from 311 stakeholders, and on 738 network services from 231 stakeholders.
- From the data sets and services, 66.7% have metadata, but only 35.5% have ISO compliant metadata. The situation is better for data sets than for network services.
- From all the reported data sets, 55.7% can be discovered, 49.2% can be viewed and 27.2% can be downloaded (or parts thereof).
- From all the reported network services (whatever type), 75.2% is accessible for the public and 72.5% is free of use.

- For all the calculated indicators, there are important differences between the countries. Detailed results are shown in the figures of section 9.2.1 of this report.

Regarding the use of the infrastructure:

- The reported use of the infrastructure is quite diverse: several countries report upon this, but they use often different units of measurement and different time intervals; other countries do not report at all. These differences are normal since INSPIRE is not yet implemented. If and how use and performance should be monitored/reported still has to be decided. Some examples are described in this report.

Regarding data sharing:

- The survey showed that several countries are considering the coordination of the implementation of INSPIRE, and possibly their National Spatial Data Infrastructure. In a small number of countries (Cyprus, Portugal, Spain, Liechtenstein and Norway), a coordinating body is already in place. While preparing this report, probably other countries joined this list. In some of the countries where a coordinating body is already in place, this body can make agreements on behalf of the public authorities.
- The survey intended also to examine whether the public sector is granted special terms or whether they acquire data on the same terms as the private sector does. From the countries that answered this question, a small majority has different terms and conditions for the public sector, including different prices or data that is only available for other public authorities.
- With regard to the harmonization of terms and conditions for spatial data sharing, the countries were asked whether it would be feasible to use a single model licence between public authorities for all public task use. Seven countries felt that this would be feasible.
- Article 17.7 of the INSPIRE directive allows the Member States to limit sharing of spatial data when this would compromise the course of justice, public security, national defence or international relations. 8 countries (of the 12 that answered) indicate that such reasons could be invoked. 11 of the 34 themes are mentioned more than once.

The general assessment reveals that INSPIRE has stimulated the further development of the infrastructure: particular work has been done in the field of metadata and service development. Data harmonisations efforts or creation of new data sets seem to continue at a lower pace. On the other hand, one can also see the impact of the (re-)organisation due to INSPIRE. More stakeholders, especially users (e.g. Ministries) are involved and take active part in the coordination. Two countries, i.e. Poland and Norway, are now also evaluated as being more operational than the year before. Due to the review of some indicators based on the quantified input from the survey, two countries score ‘less in agreement’ for metadata. Overall, the trends are positive with many activities taking place. When reading the report, one has to take into account that 9 countries did not give input at all.

In a separate chapter we give some conclusions and recommendations to support further implementation of the INSPIRE Directive.

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5. ABBREVIATIONS AND ACRONYMS

The following list presents the abbreviations and acronyms commonly used in this report. Abbreviations and acronyms used in the annexed country reports are listed in those reports.

AOPK	Agency for Nature Conservation and Landscape Protection
BTA	Base Topogràfica Armonizada
CAGI	Czech Association for Geomatics
CC	Candidate State
CCSS	Czech Centre for Science and Society
CDV	Transport Research Centre
CGS	Czech Geological Survey
CSO	Czech Statistical Office
DT	Drafting Team
DT DSS	Drafting Team on Data and Service Sharing
DT MR	Drafting Team on monitoring and reporting
EC	European Commission
EEA	European Environmental Agency
EFTA	European Free Trade Association
ESDI	European Spatial Data Infrastructure
ESTAT	Statistical Office of the European Communities
EU	European Union
EUROGI	European Umbrella Organisation for Geographic Information
FOI	Freedom of Information
GI	Geographical Information
GII	Geographical Information Infrastructure
GIS	Geographic Information System
GMES	Global Monitoring of Environment and Sustainability
GSDI	Global Spatial Data Infrastructure
IDEE	Spanish SDI
INSPIRE	Infrastructure for Spatial Information in Europe
ISO	International Standards Organisation
JRC	Joint Research Centre of the European Commission
LM	Lantmäteriet (National Land Survey of Sweden)
LSDI	Local Spatial Data Infrastructure
MoE	Ministry of Environment
MoI	Ministry of Informatics
MS	Member State
NA	Not Applicable
NDP	National Data Producer
NMA	National Mapping Agency

NGO	Non Governmental Organisation
NIA	No Information Available
(N)SDI	(National) Spatial Data Infrastructure
PNOA	National Plan for Aerial Orthophoto
PPP	Public-Private Partnership
PSI	Public Sector Information
QCP	Quality Control Procedure
RSDI	Regional Spatial Data Infrastructure
SIOSE	Land Cover and Land Use Information System of Spain
SIS	Swedish Standardisation Institute
SoP	State of Play
TEN	Trans European Network
TSDI	Thematic Spatial Data Infrastructure
VESTA-GIS	Vocational Education and Sectoral Training Network on GIS & GI Applications domains
WFS	Web Feature Service
WMS	Web Mapping Service

6. INTRODUCTION

In 2001, the European Commission launched the INSPIRE initiative. It was based on the observation that the accessibility, interoperability and affordability of spatial data and information systems were limited. It was generally recognised that this situation prevents society to fully benefit from the potential of the technology to improve the relevancy, accuracy, impact and public control of territorial policies and related decisions at all scales and to involve citizens, businesses, non governmental and research organisations in a participatory information society.

With the INSPIRE initiative, the European Union – in collaboration with all the relevant stakeholders - intends to establish an infrastructure for spatial information in Europe that will allow the public sector users at the European, national, regional and local levels to share spatial data from a wide range of sources in an interoperable way for the execution of a variety of public tasks at conditions which do not restrain its use. Moreover, users in private, research and NGO-environments and the citizen will be offered services to discover, view, download and when necessary transform these spatial data sources. Environmental policies, for which the spatial dimension constitutes an important component, have been chosen as the starting point to establish this spatial infrastructure.

To reach these objectives, the European Commissioners of Environment, Economic and Monetary affairs and Research agreed in 2002 about a Memorandum of Understanding, not only recognising the problem but also indicating the steps to be taken to develop such an infrastructure. One of the key elements in the MoU was the need for a legislative framework. In order to develop the INSPIRE legislation, all GI stakeholders were mobilised in relevant working groups in order to prepare the drafting process of the proposed Directive. Mid 2004, the proposal for a Directive of the European Parliament and of the Council - *Establishing an infrastructure for spatial information in the Community (INSPIRE)* - saw light. Between then and autumn 2006, several readings took place by the Parliament and the Council which resulted - after a conciliation phase during which final amendments were made - in the adoption of the Directive on November 21st 2006. On 18 January 2007, a joint text of the European Parliament and the Council was approved by the Conciliation Committee. Directive 2007/2/EC of the European Parliament and of the Council of 14 March 2007 establishing an Infrastructure for Spatial Information in the European Community (INSPIRE) was published in the Official Journal of the EU on 25 April 2007 and entered into force on 15 May 2007.

The EC, the INSPIRE expert group and all the (N)SDI stakeholders recognised from the very beginning that the building blocks for a European spatial information infrastructure consist of the operational or emerging national, regional and local SDI. However, in 2002, the Commission had only a partial view of what was going on in Europe.

Therefore, the EC launched a study, *"Status of the National Spatial Data Infrastructures in Europe, a State of Play"* covering the period mid 2002- mid 2005 (later extended with new studies for 2006 and this current 2007 update), to describe, monitor and analyse the activities related to the national spatial data infrastructures in 32 European countries: 27 EU Member States[1], 1 Candidate Country and 4 EFTA countries. The major activity of this study was to collect and structure all the relevant information on the status of the 5 components which form together an SDI: legal framework and funding, reference data and core thematic data, metadata, access and other services, and standards (Nebert, 2000; 2004). The Cookbook was used as a sort of baseline. It was decided to study a sixth component, i.e. thematic environmental data. This study resulted in 32 country reports describing the status of the (N)SDI in 2003, 2004, 2005

[1] At the time the study started, there were 15 Member States, 10 Accession Countries, 3 Candidate Countries and 4 EFTA countries. Note also that Croatia is not in the list of 32 countries studied.

and 2006, as well in summary reports assessing the overall status in Europe in these years. In all those reports, focus was on the state of play of the general purpose SDI-efforts which were ongoing or planned at the national public sector level.

The current report is the summary of the State of Play of the same 32 (N)SDI's in Europe for 2007. As such this report presents the 2007 update of the INSPIRE State of Play study initially carried out in 2002-03 and subsequently updated in 2004, 2005 and 2006. Similar to previous phases, the State of Play update 2007 was carried out by staff from SADL and ICRI, two entities within K.U.Leuven.

It is important to underline that since the update of 2006, the State of Play has gone through an important shift in methodology in order to bring the State of Play more in line with the INSPIRE Directive[2], and especially with the ongoing work of the INSPIRE Drafting Team on Monitoring and Reporting (see Vandenbroucke and Janssen, 2007).

The report is conceived as follows:

- The next (seventh) chapter recalls the original objectives and the objectives of the 2007 update of the State of Play study of which this report is a deliverable;

- The eight chapter describes the approach ('materials and methods') for this study. The approach and methods used in the original study are recalled in a first section. The methodological shift that was initiated in 2006 to bring the State of Play in line with the INSPIRE Directive is summarised in a second section. This chapter also describes the fine-tuning of the methodological shift which took place in 2007.

- The results for 2007 are summarized in chapter nine. This chapter gives some general observations and describes in detail the results of the survey carried out at the end of 2007, beginning of 2008. The survey focused on the developments of the NSDI infrastructure and data sharing practices. The chapter provides also – in line with previous years - an overview table of the state of play of SDI for each of the 32 countries by the end of 2007 and includes a matrix highlighting changes which occurred between 2007 and 2006, and between 2007 and 2003. Also the outcome of the typology exercise for 2007 is presented and compared with the one elaborated in previous years.

- Chapter ten gives some conclusions and recommendations to take into account during the implementation process of INSPIRE.

- In separate volumes, annexed to this report, the 32 updated country reports are presented.

- An executive summary, which can also be read in terms of a number of conclusions of the study, is available as the first chapter.

[2] Which did not yet exist at the time of the first study.

7. OBJECTIVES AND ASSUMPTIONS

7.1 Objectives

The objective of the study launched in 2002 was to identify, describe and compare the current status of the NSDI in the different Member States of the EU, in the Accession and Candidate Countries, and the EFTA Countries. The general objective was reflected in five concrete objectives:

1. The description of the status of the NSDI and their components in these 32 European countries;
2. An in depth analysis of how the NSDIs are functioning in some selected countries;
3. A mutual comparison of the situation in the different countries and a limited comparison with the situation in Canada, the United States of America and Australia;
4. The formulation of recommendations for integrating the different infrastructures in an European SDI and
5. The proposal of a methodology to monitor the technical and organisational evolution of the NSDIs.

For 2007, the objective is to prepare the update of the State of Play taking into account the final INSPIRE Directive and the work carried out by the Drafting Teams (DT), and the DT on Monitoring and Reporting (DT MR) and Data and Service Sharing (DT DSS) in particular. There are five sub-objectives for the 2007 update:

1. Fine-tune the methodological approach which has been initiated during the INSPIRE SoP update of 2006.
2. Drafting of the individual country update reports on the status of spatial data infrastructures in each of the MS, the CC and EFTA (32 countries).
3. Performing of a survey on metadata, spatial data and services, and data & service sharing best practices in the MS. The latter is to be based on a questionnaire provided by the DT DSS.
4. Testing and evaluation of the methodological adaptation as proposed in the State of Play 2006, aiming at compliance with the monitoring and reporting measures defined in the INSPIRE draft Implementing Rules development process.
5. Drafting of a summary report providing a comparative overview of the situation of the MS, the CC and EFTA, including recommendations for the further development of INSPIRE.

7.2 Assumptions

Throughout all activities of this study, the emphasis is on general purpose SDI-initiatives, i.e. SDIs for which the promotion of the sharing and re-use of spatial reference and thematic data is the core activity. In all countries this type of SDIs is developed mainly by public sector players, in a lot of cases in collaboration with the private sector. SDIs focusing on thematic environmental data have also been considered but other types of thematic SDI have only been mentioned. Secondly,

attention was focused on initiatives focusing on the national scale, i.e. NSDI, rather than lower level initiatives.

However, when a national SDI is clearly lacking or when regional SDIs are strongly developed (or make an important contribution to the national level), we also focused on either the most important, i.e. best developed or the most representative lower level SDI in that country. Especially in decentralized countries regional SDI are often pertinently present. Comparison of NSDI is done for the national level only in order to guarantee comparability (with the exception of Belgium during the first three years since no national level initiative existed at that time). We are aware that the country reports therefore give only a partial view of the rich reality in those countries. In particular, the further development of the regional and thematic SDI has been important.

Only freely accessible resources and known contacts are used to describe the state of play 2007.

8. APPROACH

This chapter describes the approach and methodology in the State of Play study. In a first section we summarize the original approach as it has been applied for the study between 2002 and 2005. The second section describes the methodological shift proposed in 2006 and partially implemented in that year. It is important to remind that the overall approach did not change in order to keep comparability. The chapter describes also the fine-tuning of this new approach in 2007.

8.1 Original approach of the study

The general outlook of the original approach looks at follows: identification and description of (N)SDI initiatives in 32 countries resulting in a so called country report, assessment of the (N)SDI initiatives based on the translation of this information in 30 indicators and classification of the 32 (N)SDI initiatives according to a pre-defined topology. The following sub-sections give an overview of this approach (for more details, see previous reports).

8.1.1 Identification and description of (N)SDI-initiatives in 32 countries

In 2002 a methodology was worked out to identify and describe the (N)SDI initiatives in any of the 32 European countries studied. It was decided not to work with a questionnaire or survey, but to apply a desktop study in a step-by-step way:

- Compilation of a list of items to describe the (N)SDIs based on the GSDI Cookbook and the INSPIRE position papers (Nebert, 2000; 2004; European Commission, 2002). This check-list was used to extract the relevant elements from the consulted information sources. After rearranging, the list was used as the template for the description of the (N)SDI in the country reports. The items to describe the (N)SDI were grouped according to the 5 components as described in the GSDI Cookbook: legal framework and funding, reference data and core thematic data, metadata, access and other services, and standards. A 6th component was added: thematic environmental data.

- In the first stage (September – December 2002), the country reports were compiled based on the consultation of various web sites, documents and project references readily accessible. Most resources were gathered from the internet;

- Since at that time for some countries almost no information could be found in this way, where possible, some key persons were contacted. In addition, a list of information sources was sent to all INSPIRE Working Group members in order to get feedback about its completeness. Sporadically, new data sources could be identified that way;

- 31 country reports (Switzerland and Liechtenstein were combined in 1 report) resulted from the first stage (beginning of 2003). This means that in every country at least one NSDI- or NSDI-related initiative was found;

- In the second stage (April-June 2003), the country reports were submitted to experts in each of the 32 countries. The experts were identified through the

INSPIRE expert committee. In some countries, the report was handed over to other organizations and persons for further update. In this way, for most of the reports, corrections and updates were provided;

- Through the visits to a selection of countries some extra information could be collected which, where relevant, was added to the country reports;

- The resulting country reports were used for the update of 2004 which in turn were used to produce the update of 2005. For each of the updates, additional information was gathered through the experts from the INSPIRE expert committee, visit of relevant websites, reading of strategic and other relevant SDI documents, and through information collected during workshops and SDI related activities (e.g. EC GI&GIS workshop, now called INSPIRE conference). In the meantime, spontaneously, several stakeholders from different countries also sent new information in the course of the years under study. For each update the previous version of the report was modified with important changes highlighted (in a change table and in the text itself).

8.1.2 Comparative summary of the (N)SDI

Based on these country reports, a methodology was developed to asses the status of the (N)SDI. The presented items in the reports relate to a number of organizational and technical issues as described in the GSDI Cookbook and the INSPIRE position papers. They can be considered as the building blocks of the SDI under study. The items or building blocks are expressed as statements or indicators. In this original approach, there were 30 indicators defined in that way (see Van Orshoven et.al., 2003). The assessment of the studied SDI-initiative has been made in terms of whether it is (1) in full agreement with the statement, (2) in partial agreement, (3) not in agreement or (4) whether not sufficient information is available for assessing the level of agreement. The assessment was carried out annually and resulted in an assessment matrix for each year giving the results for all the 32 countries and 30 indicators studied. The 30 indicators were represented in this matrix, grouped according to the 6 components (legal issues and funding, reference and core thematic data, metadata, access and other services and standards). The organizational indicators were put together as well. This resulted in matrices subdivided in 7 parts[3].

With the rating according to the scheme as described above, reality is of course strongly simplified and it is only possible through interpretation of the facts as represented in the (incomplete) country reports. E.g. the fact that a particular NSDI is evaluated as being in agreement with the three statements about the metadata component only means that substantial work has been done in relation to metadata. This implies that the practical meaning of these 'indicators' to assess progress made over time with respect to metadata production and implementation, is limited. For every country a NSDI-initiative is assessed.

Change matrixes have been elaborated in additional tables highlighting the new or corrected information which has been collected throughout the years and they show progress some countries have made in developing their NSDI.

8.1.3 Typology of (N)SDI in 32 countries

The primary goal of the typology as elaborated for the 2003 report, and repeated for the 2004 and 2005 situation, was to recognize the different types of SDI for the assessment of their potential contribution to the development and implementation of a successful European SDI. In the typology, we emphasized the matters of coordination since it is obvious that coordination is the major success factor for each SDI and since coordination is tackled in different ways according to the political and administrative

[3] From this point of view, one can also argue that the INSPIRE SoP study studied 7 components. In GSDI Cookbook, no distinction is made between organizational issues and legal/funding issues.

organization of the country. The way an SDI-initiative is coordinated is undoubtedly one of its more pertinent characteristics (see also Masser, 1999; 2005; 2007).

In order to make the typology also useful for monitoring purposes, the degree of 'operationality' of the SDI is taken into account. The latter is a rather subjective (overall) assessment of the level of the services the SDI is providing, which is based on the assessment of the building blocks of the SDI as described in the assessment tables. It does not mean that all characteristics of NSDI as can be derived from the INSPIRE-position papers are in place (see http://www.ec-gis.org/INSPIRE). It rather means that production of GI is coordinated to at least a certain extent and that users of GI are supported in finding and re-using GI through SDI-mechanisms.

By comparing the classification of the NSDI over the years, major changes in the characteristics of the NSDI could be easily identified as shifts between classes of the typology. It was obvious however that the simple and broad nature of the typology could not lead to the detection of subtle changes.

From the more complete description of the status of SDI for 2003, it was obvious that in almost every European country (Bulgaria was an exception to this at that time), one organization of the NDP-type (NMA, Land Survey Service, Cadastral Agency) is present having the formal mandate to, a.o. maintain the national geodetic reference system, produce topographic reference data and –often- coordinate data production and dissemination with other players. As such the NDP has an implicit mandate to set up an SDI, albeit mainly from the producers' perspective. We considered this as the most basic level of SDI. User communities may or may not be active in steering committees and/or advisory boards for the NDP and NSDI. A GI-association may or may not exist, be active or not.

We distinguished countries with this type of GI-coordination from those where, of course NDP are also present, but where the NMA or another traditional data producer is not the main coordinator of the NSDI. In those countries the SDI is rather driven by a council of ministries or administrative departments, a GI-association or another type of partnership of –mainly- data users. Fundamental to this type of SDI-initiative is that the participants are willing to share each other's spatial data and those acquired from third parties and to remove the obstacles preventing this. From this perspective, participants are mainly users of GI which is acquired from the data producers. The initiative may result in a joint framework for negotiation of the SDI-participants with the data providers for optimal conditions of data characteristics, conditions or licenses for use and re-use, price, access. Such partnerships may be based on (i) a formal mandate or law, (ii) a (temporary) project agreement or (iii) voluntary contributions.

In each distinguished group, the degree of operationality as derived from the presence and accessibility of the other SDI-components was included as a further discriminating factor.

8.2 Modified approach since the update of 2006

The major aim of the review of the methodology developed for the INSPIRE State of Play study is to adapt it as much as possible to the INSPIRE Directive and the ongoing work within the INSPIRE Drafting Teams, especially the one on monitoring and reporting. In a first section we give a summary of the review as it was conceived in 2006. In a second section we describe the fine-tuning that took place in 2007, as well as how the modified approach was applied.

8.2.1 Summary of the review of 2006

8.2.1.1 Step-by-step review

During the 2006 review, it was decided to have a closer look at the original assessment procedure, including the way of reporting and the assessment methods. The review was done in five steps:

- Step 1: analysis of the original approach in terms of strengths and weaknesses as became obvious through the 2004 and 2005 updates;
- Step 2: analyse feedback from stakeholders collected in the past;
- Step 3: listing of all inconsistencies and drawbacks (and potential drawbacks), as well as strong points; actions to be taken;
- Step 4: comparison with the indicators proposed by DT MR;
- Step 5: elaboration of a potential migration path (from SoP > DT MR).

In general terms, it was decided not to review the methodology too drastically, and to keep the overall approach for reasons of comparability and continuity. In addition to this, the country reports, as elaborated between 2003 and 2005, were reviewed without making too drastic changes to the structure neither, and this for the same reason. Following elements were taken into consideration:

- The terminology used so far was brought in line with the INSPIRE terminology;
- The chapter on standards was integrated in the three technical chapters (data, metadata and services);
- The chapter on organisational, legal and financial issues was split. One chapter now deals with organisational issues, the other one with legal / financial issues;
- It has been decided to keep the chapter on the sixth component (environment) although the other chapters refer to environmental information and services as well (which results sometimes in repetition of information).[4]

8.2.1.2 Critical review of the original indicators

All the 30 indicators were analysed: their strong points, as well as their weaknesses and drawbacks. It was decided whether actions had to be taken (dropping, adding indicators, clarifying them, etc.)

- There were two indicators added in order to cover all the possible services from the INSPIRE Directive (discovery, view, download, transformation, middleware or invoking services). In the original approach this distinction was not made.
- For some indicators, the way of collecting information changed, allowing quantification of the indicator. However this was only tested in a very limited way in the 2006 update.
- Some indicators are based on more precise/detailed (additional) information and additional/other questions have to be answered to make the assessment. As an example we can mention the indicator I.2:

  "One or more components of the SDI have reached a significant level of operationality" (I.2)

  This indicator is fully agreed with if one of the components as described by the GSDI cookbook is in place. So no distinction was made between an SDI with all of the components in place and those that have only one in place. In reality this indicator as it stands now does not allow to assess the status of development of the SDI. The word "significant" leaves also room for interpretation. It does not allow to know whether it is a pilot/test or long term setup. It was proposed to add a figure between 1 and 6 to indicate the number of components (with organisational legal and funding issues taken as one component) for which the SDI is well developed (agreement with most of the indicators).
- Most indicators remained as they were.

For more information on this critical review, we refer to the summary report of 2006 (Vandenbroucke and Janssen, 2007). The updated list of indicators looks as follows (in bold modified indicators):

[4] As said before, the tables and matrices group the 30 indicators in 7 parts. This has not been changed in 2006 and 2007 for the same reason of comparability.

Table 1: Indicators for organisational, legal and financial building blocks

I. Organisational issues		
Level of SDI	1	The approach and territorial coverage of the SDI is truly national
Degree of operationality	2	One or more components of the SDI have reached a significant level of operationality . **Figure between 1 and 6 added.**
Coordination	3	The officially recognised or de facto coordinating body of the SDI is a NDP, i.e. a NMA or a comparable organisation (Cadastral or Land Survey Agency, i.e. a major producer of GI)
	4	The officially recognised or de facto coordinating body for the SDI is an organisation controlled by data users
	5	An organisation of the type 'national GI-association' is involved in the coordination of the SDI
Participants	6	Producers and users of spatial data are participating in the SDI
	7	Only public sector actors are participating in the SDI
II. Legal issues and funding		
Legal framework	8	There is a legal instrument or framework determining the SDI-strategy or -development
Public-private partnerships (PPP)	9	There are true PPP's or other co-financing mechanisms between public and private sector bodies with respect to the development and operation of the SDI-related projects
Policy and legislation on access to public sector information (PSI)	10	There is a freedom of information (FOI) act which contains specific FOI legislation for the GI-sector
Legal protection of GI by intellectual property rights	11	GI can specifically be protected by copyright
Restricted access to GI further to the legal protection of privacy	12	Privacy laws are actively being taken into account by the holders of GI
Data licensing	13	There is a framework or policy for sharing GI between public institutions
	14	There are simplified and standardised licences for personal use
Funding model for the SDI and pricing policy	15	The long-term financial security of the SDI-initiative is secured
	16	There is a pricing framework for trading, using and/or commercialising GI

Table 2: Indicators for the technical building blocks

III. **Data for the themes of the INSPIRE annexes**		
Scale and resolution	17	Geodatasets exist which provide a basis for contributing to the coverage of pan-Europe for the INSPIRE-selected data themes and components
Geodetic reference systems and projections	18	The geodetic reference system and projection systems are standardised, documented and interconvertable
Quality of reference data & core thematic data	19	There is a documented data quality control procedure applied at the level of the SDI
Interoperability	20	Concern for interoperability goes beyond conversion between different data formats
Language and culture	21	The national language is the operational language of the SDI
	22	English is used as secondary language
IV. Metadata for the **data of the themes of the INSPIRE annexes**		
Availability of metadata	23	Metadata are produced for a significant fraction of geodatasets of **the themes of the INSPIRE annexes**
Metadata catalogue availability + standard	24	One or more standardised metadata catalogues are available covering more than one data producing agency
Metadata implementation	25	There is a coordinating authority for metadata implementation at the level of the SDI
V. Access and other services **for data and their metadata**		
Discovery Services	26	**There are one or more discovery services making it possible to search for data and services through metadata**
View Services	**27**	There are one or more **view** services available for **to visualise data from the themes of the INSPIRE annexes**
Download Services	**28**	There are one ore more on-line **download** services **enabling (parts of) copies of datasets**
Transformation Services	**29**	**There are one or more transformation services enabling spatial datasets to be transformed to achieve interoperability**
Middleware Service	**30**	**There are one or more middleware services allowing data services to be invoked**
VI. Standards		
Standards	**31**	The SDI-initiative is devoting significant attention to standardisation issues
VII. Thematic environmental data		
Thematic Environmental data	**32**	Thematic environmental data are covered by the described SDI-initiative or there is an independent thematic environmental SDI

8.2.1.3 From SoP to DT: mapping indicators

The State of Play started in 2002 and aimed at that time to have a better view on the development of the (N)SDI in 32 European countries. As explained in previous sections, the assessment of the (N)SDI was carried out against the components as described in the GSDI cookbook which acted as a kind of baseline. The INSPIRE Directive did not yet exist at that time.

In 2004 the proposal for an INSPIRE Directive saw light. The Directive was only published in April 2007, and entered into force on 15 May 2007. The Directive sets out how the Member States of the EU should set up their (N)SDI to enhance data sharing amongst public authorities for environmental policy. The Directive contains chapters about the need for interoperable data and services, metadata, data sharing mechanisms, and the need to coordinate the efforts of all the relevant stakeholders in order to achieve this. The Directive also contains a chapter on the need to monitor and report on the progress being made and gives for some of the components even a time frame for doing so. Implementing rules will define which indicators shall be used to monitor progress. They will also contain guidelines how to collect information to feed the indicators, and how to report the results to the Commission at fixed time intervals.

Once the Member States will have the obligation to start this monitoring and reporting process[5], the SoP will – in a certain way - become obsolete. Therefore, the final aim is to replace the SoP with this new coherent monitoring and reporting mechanism as defined by the implementing rules of the INSPIRE Directive. This will be done step by step. It is necessary to think how the results of the SoP carried out so far can be compared with monitoring and reporting of the INSPIRE Directive and vice versa. The reason for trying to match both approaches is to be able to assess development over time, and not to start from scratch a total new assessment process that is not comparable at all with the efforts made in the SoP.

In September 2006, SADL tried to map the 30 original indicators with the 15 indicators which were defined at that time by the DT on M&R. The analysis of 2006 showed that this mapping is not straightforward (for several reasons), even if there are clear links between some of the indicators. One of the most important reasons for this is that the indicators of the SoP do not quantify, while almost all the DT indicators are quantifiable (see also Vandenbroucke and Janssen, 2007).

8.2.2 Fine-tuning the review in 2007

It became clear in 2006 that the mapping is not straightforward since some indicators of the DT MR are totally new (and vice versa) or have different objectives. In addition, one should note that the work of the DT MR was not finalised in 2006, and even throughout 2007 the proposed indicators changed considerably. In February 2008, indicators for coordination & cooperation, and for data and service sharing even ‘disappeared’ from the list of indicators of the DT MR.

Two specific objectives were defined at the start of the 2007 update to fine-tune the methodological shift

- The results of the work of the DT MR need to be analysed in view of the further modification of the methodology. In particular, attention had to be paid to the collection of information (raw data) regarding data, metadata and services. Also the mapping with the updated list of indicators from the DT MR had to be reviewed with the new indicators of the DT MR.

[5] The monitoring process should start once the implementing rules have been adopted. This expected to be in 2008. The first reporting is foreseen not later than 3 years after the Directive entered into force. Notice that it will be the Member States who will be responsible for monitoring and reporting on progress. At EU level, the Commission will be responsible for making an overall assessment and reporting to the European Parliament.

- Since data sharing is a key issue in the whole INSPIRE process, the status of the work of the DT DS had to be analysed, mainly in view of adding this information to the country and summary reports.

8.2.2.1 Testing indicators from the DT MR

To reach the first objective, two templates were prepared to collect information on data sets and services as is foreseen for monitoring and reporting the Directive. In addition, some questions were added to collect information on the use of (components of) the infrastructure, on the costs and the positive impact / benefits of the NSDI. Table 3 gives an overview of the information regarding the technical infrastructure collected through the two templates (the templates can be found in annex 13.5 and 13.6).

Table 3: Information (raw data) gathered during the 2007 survey

Component	Information gathered	Contributes to indicator
Data sets for each theme	Identifier (name)	All indicators on data sets and metadata
	Organisation responsible	Not relevant
	Scale/resolution	Not relevant
	Metadata (N/Y/ISO)	Existence of metadata (MDi1) Compliancy of metadata (MDi2)
	Accessibility (discovery, view, download service)	Accessibility of metadata (DSi1) Existence and compliancy of services (DSi2)
Services	Identifier (name, URL, …)	All indicators on services
	Organisation responsible	Not relevant
	Type of service (discovery, …)	Existence and compliancy of services (DSi2)
	Metadata (N/Y/ISO)	Existence and compliancy of services (DSi2)
	Open for public (N/Y)	Usability (DSSi2)
	Free (N/Y)	Usability (DSSi2)

With this information we can try to simulate some of the indicators from the DT MR (as described in the original document D5.2 – list of indicators, see http://www.ec-gis.org/INSPIRE). Of course, the indicators that refer to compliancy with the Implementing Rules could not be calculated as proposed by the DT MR, e.g. compliancy of the services with the IR is not possible yet, since the rules do not exist yet (at the time of writing).

Some useful general parameters regarding the infrastructure were gathered as well: e.g. number of data sets. In that way, we can detect gaps in the infrastructure, e.g. the themes for which a country does not have or can't provide information. The coverage of the data sets was not yet asked for.

The survey also meant as an enlarged feasibility test to detect difficulties in collecting and providing raw data (e.g. list of data sets and services), but also to detect different ways of interpreting/applying the template schemes (see also section 9.2).

8.2.2.2 Data and service sharing

Information on data and service sharing practices were collected through a series of questions established by the DT DSS. Following questions were put forward:

1. Do you have a body (such as the national contact point) that could, with its existing or planned structures, co-ordinate the supply of data and services from public bodies to Community institutions and bodies?

If yes,

- What level is it (regional, national, international etc)?
- How will it do this?
- Could it make agreements on behalf of the public authorities?
- Could it manage access on behalf of the public authorities?
- Could it deliver data and services on behalf of the public authorities?

2. If you are answering as a single public authority - Do you have special terms for how other public authorities can use your information, or do they acquire information on the same terms as the private sector does? If you have special terms, please supply a copy of this.

If you are answering on behalf of the MS - Do you have special terms for how a public authority can use information from another public authority, or do they acquire information on the same terms as the private sector does? If you have special terms, please supply copies of this.

3. Would it be feasible to use a single model licence between public sector authorities for all public task use? If this is not feasible in all situations, please give examples of situations in which it is not feasible. If you already are using such a license, please provide a copy.

Following questions of interest but not for the DT-DSS work:

4. Article 17.7 of the INSPIRE Directive allows MS to limit sharing of data when this would compromise the course of justice, public security, national defence or international relations. Please give examples for which datasets from the INSPIRE annexes this might be invoked by the MS.

5. Article 17.6 of the INSPIRE Directive allows MS to accompany their data with national law requirements. Please give specific examples of the sort of requirements this would include and for which dataset.

6. Article 17§3 allows for licensing and payments. Can you indicate for which data themes as listed in the INSPIRE annexes, sharing would:

- Require a level of charging reflecting the need of the data produce to be totally self-financing with no structural financing;
- Require a level of charging reflecting only the costs related to the distribution mechanisms (e.g. Recovery of costs related to the set up of a download service, but basic collection and distribution costs are covered by other (structural) financing mechanisms;
- Require no charging (as all costs are covered by a structural financing mechanism).

9. STATE OF PLAY OF THE SDI 2007

9.1 Introduction

The work on the State of Play, update 2007, started in October 2007 and continued until April 2008. Therefore, the results as described in the country reports and in this summary report refer to the status of the (N)SDI at the end of 2007, beginning of 2008.

The focus of the 2007 update was the survey on the status of the infrastructure development (data, metadata and services) and the data & service sharing practices (see section 8.2.2). Additional information was gathered in various ways. The team of K.U.Leuven attended the EC GI&GIS workshop in Porto from 4-7 July 2007. At this workshop, several stakeholders of national and regional SDI from 11 countries presented the status of (one of the components of) the SDI in 17 presentations. After and between sessions, the team members of K.U.Leuven could talk with most of the representatives and stakeholders about the SoP and ask for additional input.

End of November, a first e-mail was sent to all the contacts of the INSPIRE expert group, already known National Contact Points and other stakeholders, asking to reply on the 2007 survey and to give input for the update of 2007 (documents, new initiatives, portals, presentations, updates of the previous report, …). For the survey, a deadline was set on 18 January 2008. However most contribution came in later and several countries asked to delay the deadline. A reminder was sent on January 31. By 8 February[6], 25 countries replied: 11 countries transmitted the templates and answered the data sharing questions, 14 promised to do so. A last mail was sent on 14 March 2008.

By the end of March, 29 countries replied or contacted K.U.Leuven in one or another way. Three countries, i.e., Malta, Latvia and Turkey, did not react at all. From those 29 countries, 14 answered the questions related to the data sharing practices (7 other did not answer all the questions, but gave useful information), 21 filled in the data sets template, while 20 filled in the service template. Nine countries provided also some additional input (reports, studies, notes). For all 32 studied countries less or more information was found and included in the country reports, i.e. the survey results, the additional information received, information found on websites, as well as information gathered during events.

In the following sections we summarize the findings of the survey (section 9.2) and the assessment of the indicators for all the 32 countries studied (section 9.3).

9.2 Results from the survey

We describe in this section the specific results of the survey carried out between December 2007 and March 2008. We first describe the results regarding the status and use of the infrastructure. Secondly, we summarize the results of the answers regarding data sharing practices.

9.2.1 Status and use of the infrastructure

The information related to the data sets, their metadata and the network services was processed quantitatively per country and at EU level (at least for the countries that have

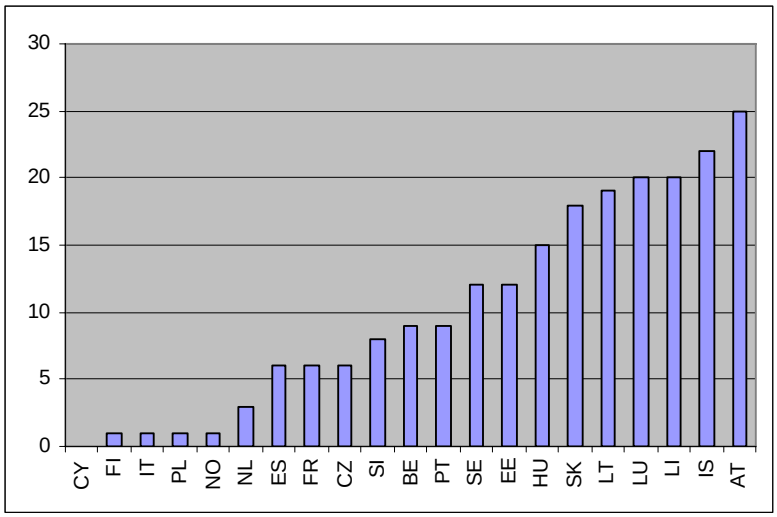
[6] That day, a Progress Meeting took place at ESTAT, Luxembourg.

sent information). The use of the infrastructure could not be processed in a systematic way since the way the information was provided does not allow this.

9.2.1.1 General issues

We received information from 21 countries regarding data sets and from 20 countries regarding services (Estonia did not fill in the template on services). The other countries did not fill in the templates and are therefore not included in the analysis, even if some of them provided extensive information for the country report (e.g. Germany). A total of 1635 data sets covering the 34 themes of the INSPIRE annexes are described, representing 1384 unique data sets.[7] In total 738 network services are described as well.

Figure 1: Number of themes of Annex I, II and III without data sets reported



Even those countries that provided information on data sets and services, did not necessarily provide all the information to describe the complete (N)SDI. It is difficult to assess how complete the templates are. Figure 1 gives an overview of the number of themes of Annex I, II and III of the INSPIRE Directive for which no data sets were reported by the 21 countries. Cyprus reported at least one data set for each of the 34 themes, while e.g. Austria left 25 of the 34 themes blank, including all the themes of Annex III.

In most cases, the lack of data sets for certain themes is due to the fact that not all the stakeholders responsible for some data sets were involved in the collection of the necessary information. But also, some countries do not always know what is covered by certain themes (question marks). The countries were asked to use the "Data Specifications" document as a guideline which provides probably not enough information for deciding to attribute certain data sets to certain themes.[8] Thus, the current gaps in the filled templates do not necessarily mean that there are no data sets for these themes. It is assumed that some of them exist, but are not yet reported. This is of course not true for all themes and countries: e.g. the oceanographic theme will remain always empty for those countries that have no sea or ocean as part of their territory.

Another important consideration is that countries reported differently. While Portugal says they only reported those data sets (and services) they consider to be "INSPIRE compliant", other countries report all data sets and services they consider to be important for INSPIRE. The latter are the data sets and services in which INSPIRE is interested, even if they are not compliant yet. All these elements have to be taken into consideration when evaluating the results as described further.

[7] Some data sets are reported more than once, i.e. under several themes. E.g., a database can contain several layers belonging to different themes.
[8] http://www.ec-gis.org/inspire/reports/ImplementingRules/inspireDataspecD2_3v2.0.pdf

Figure 2: Number of organisations responsible for one or more data sets

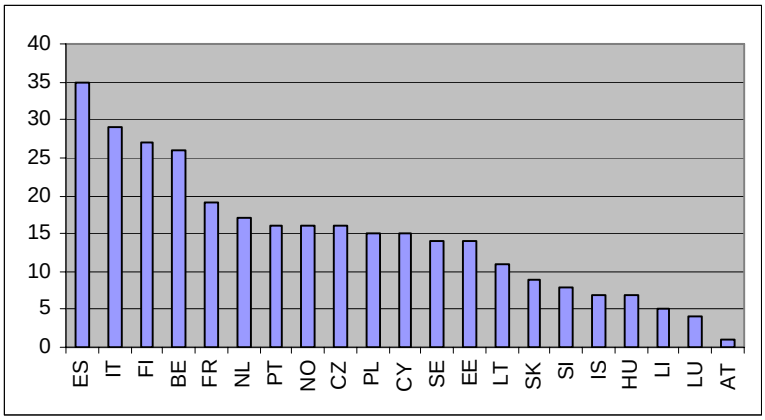


Figure 2 gives an overview of the number of organisations responsible for one or more of the reported data sets. In total, there are 311 stakeholders responsible for the 1384 unique data sets, while 231 organisations are responsible for the 738 described services. Note that the organisations described in the templates are those that are responsible for a data set, not necessarily developing/maintaining it (e.g. this can be done by external contractors), nor hosting it. From the figure we can see that Austria only reported data sets from one organisation, while Spain (IDEE and two regional SDIs) collected information from 35 organisations. The same is true for the network services.

It should be stressed that the way the templates are filled, and the quality (level of detail) of the information provided is quite variable: e.g. some countries provide a precise identifier (name) for a data set, while others rather describe the data set. For the services, sometimes the geo-portal rather than the service itself is mentioned. As a result, it was sometimes necessary to 'interpret' the information provided: e.g. when it was not explicitly mentioned that metadata exist for a given data set, we made the assumption that no metadata exist. Also, when an unclear identifier was given for a data set or service, but clear characteristics were described, the data set or service was accepted as such (without checking). The first type of problem could be avoided in the future by using online templates. Finally, in some cases countries did fill in the data sets and services lists, but not in a consistent manner: e.g. the Czech Republic listed some discovery services in the service list, but in the data sets list these were not reported (in consequence when analysing the data sets that can be discovered it gives weird results). We summarize the most pertinent issues related to the problems encountered in section 10.2.

In conclusion, we should treat the current result with care. Additional efforts will be necessary to avoid this type of problems/inconsistencies, e.g. by providing a good technical guideline.

9.2.1.2 Data and metadata

The starting point of the survey is the establishment of the list of data sets (organised per theme of the INSPIRE annexes) and of the list of network services with a total of 11 parameters collected. The existence and compliancy with the Implementing Rules on data harmonisation and interoperability could not be checked as foreseen in the draft Implementing Rules on monitoring and reporting since this information was not collected through this survey. What could be analysed however are the themes for which data sets are currently not reported (or lacking). This is illustrated in figure 3. Most of the non-reported themes are from Annex III. Sea and oceanographic features are mostly not reported because not relevant for all the continental countries that do not have sea or ocean territory: Czech Republic, Slovenia, Lichtenstein, Austria, Hungary and Luxembourg. For some of the themes, countries do not know what they represent and therefore they do not provide information on data sets, or they do not know (yet) who is in charge of this type of data.

Figure 3: Number of countries for which no data set is reported for the theme

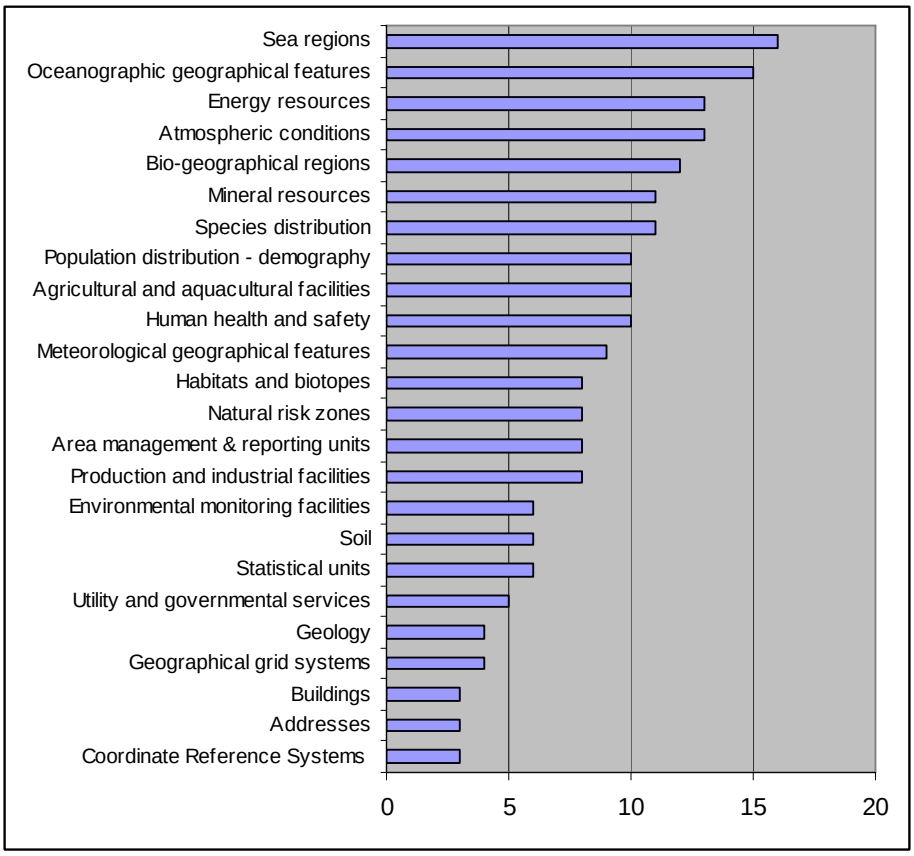
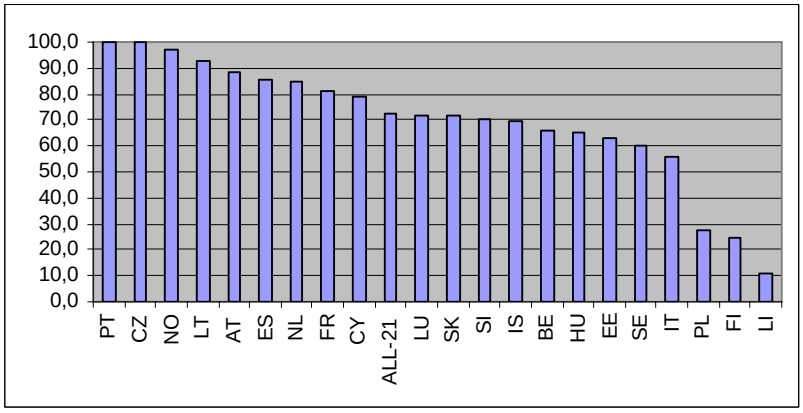


Figure 4: % of the reported data sets with metadata



From the 1635 reported data sets under the 34 themes of the INSPIRE annexes, 72.5% have metadata, but only 45.9% are reported to be ISO compliant (ISO 19115). Metadata availability varies between 11.1% (Lichtenstein) and 100.0% (Portugal and the Czech Republic). However, for Portugal it is known that they reported only that part of the infrastructure (data sets and services) that is considered to be “INSPIRE compliant” (see figure 4 and 5 for metadata for spatial data sets). So it is logic they reach the 100% mark

Figure 5: % of the reported data sets with ISO metadata

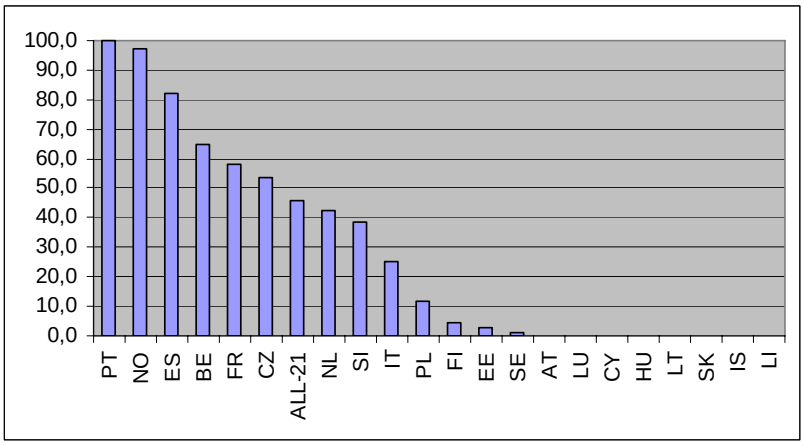


Figure 6: % of the data sets and services for which metadata exist

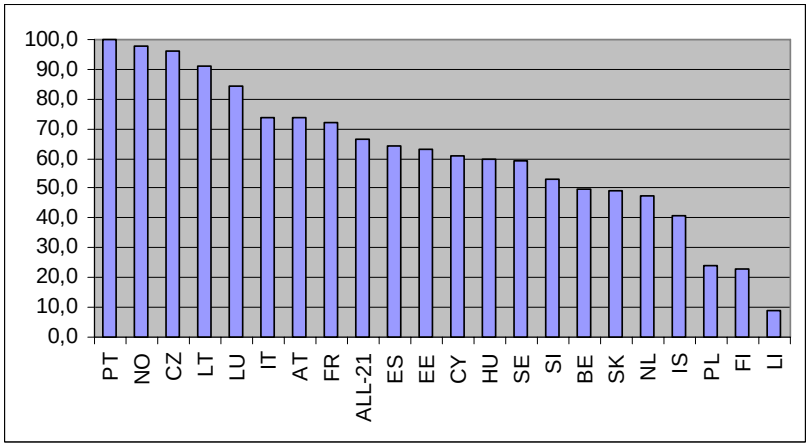
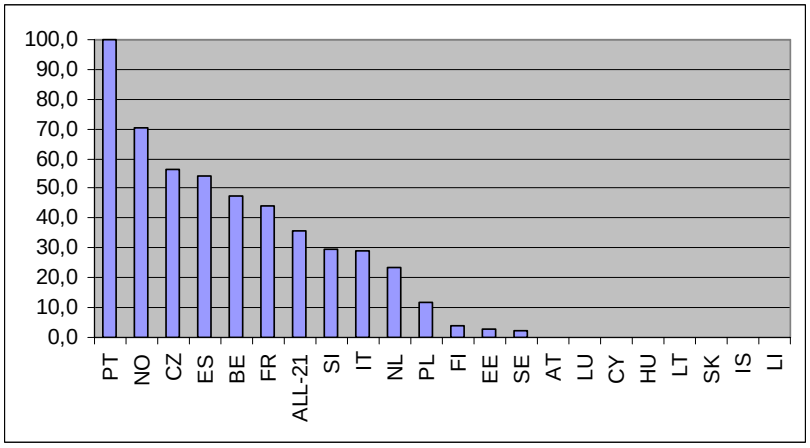


Figure 7: % of the data sets and services for which ISO metadata exist



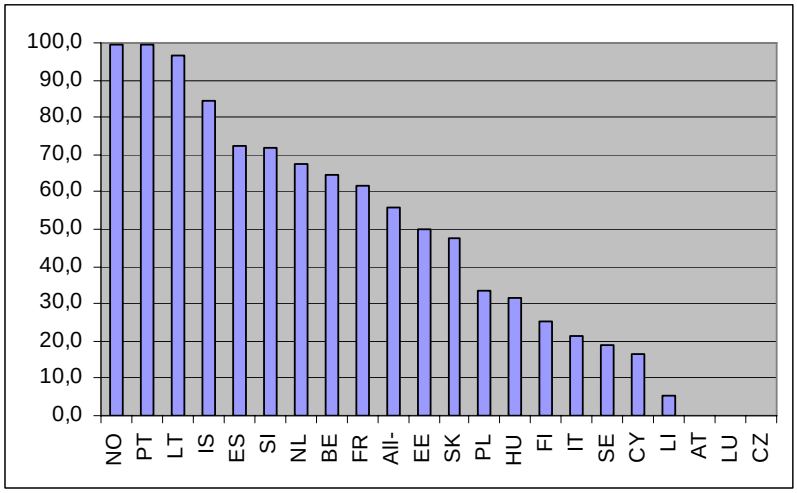
The situation regarding the metadata for services is worse. Only 53.8% of all the network services have metadata, and even only 12.3% have ISO compliant metadata. When looking at the metadata for both data sets and services (see figure 6 and 7) - as it is proposed to be calculated within the Implementing Rules for monitoring and reporting – we see respective figures of 66.7% and 35.5%. So, even if the information is incomplete and partially biased, it indicates there is quite some work to do with regard to the metadata implementation.

9.2.1.3 Network services

From the 1635 data sets 1095 (67.0%) can be discovered, viewed or downloaded. But only 362 of them (22.1%) can be discovered, viewed and download. Figures 8, 9 and 10 show the figures per country for each of the service types. For the 21 countries for which information was collected, 55.7% of the data sets can be discovered, 49.2% can be viewed, while 27.2% can be downloaded (or parts thereof, WFS).

However, there are important differences between the countries. While almost all the data sets described by Norway, Portugal and Lithuania can be discovered (> 95%), data sets described by Austria, Luxembourg and the Czech republic are – according to the information templates – not discoverable through at least one discovery service.

Figure 8: % of data sets that can be discovered



For the Czech Republic this reflects – as explained before – the fact that in the data sets template no information was provided for these parameters while on the other hand the service list reveals there are discovery services.

Similar differences can be detected for viewing and downloading of data sets. In most cases, the same countries score high or, oppositely, low. The big exception is Austria which has a high % of data sets that can be viewed and downloaded. Austria and Norway score particular well regarding download capabilities. We repeat however that we did not test this (in the template on data sets there is no direct link to the ID of the services in the second template).

Figure 9: % of data sets that can be viewed

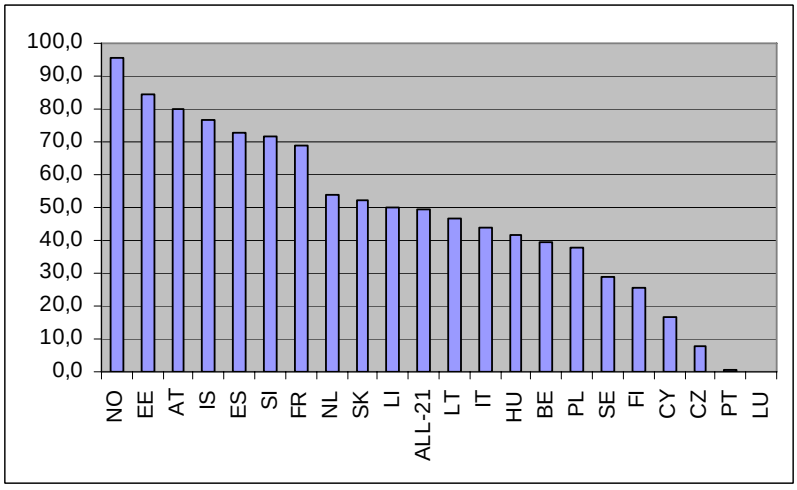
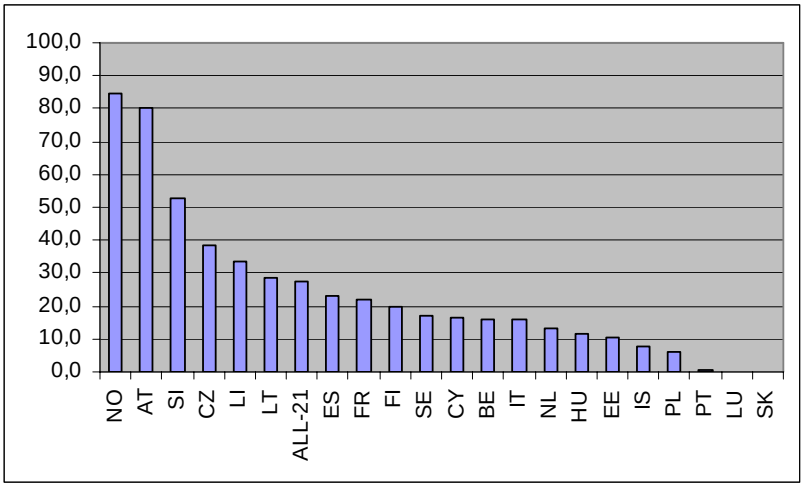


Figure 10: % of data sets that can be downloaded



For each of the described services (167 discovery, 559 viewing and 149 download services) it was asked whether they are open for the public and whether they are free of use. The results were put together for the 20 countries that gave information (see table 11 and 12).

Six countries have services which are all open for the public: The Netherlands, Iceland, Portugal, Cyprus, Lithuania and Finland. All services are free of use for the first four of them. For all the services described for the 21 countries investigated, 75.2% is accessible for the public, while 72.5% is free of use. These figures are higher than expected. But again, this is partially related to the fact that some countries only report services that are 'compliant', free, etc. This can be seen in the example of the Netherlands, where we know that also paying services exist. Only, they are not found back in the list of services and therefore the score of NL is 100%.

Figure 11: % of the services that is open to the public

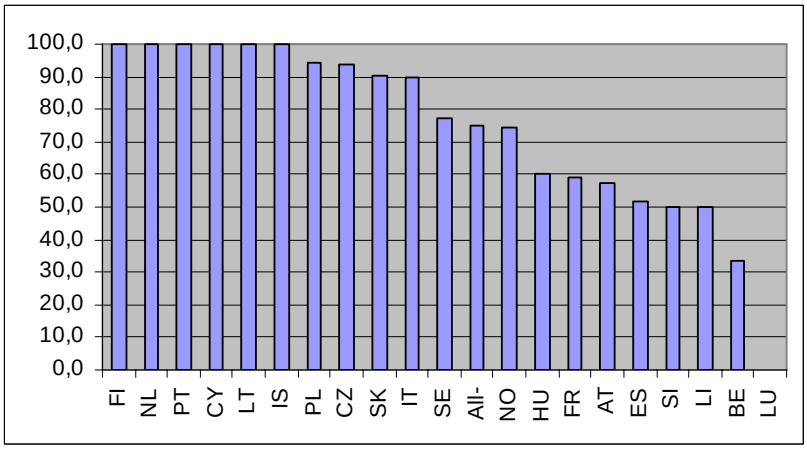
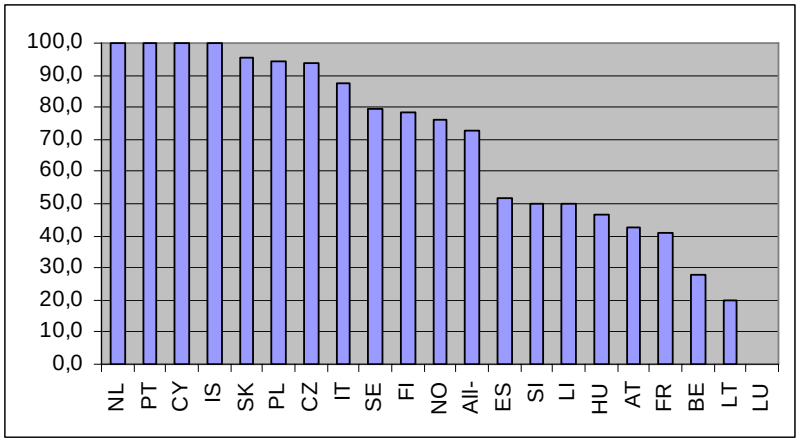


Figure 12: % of the services that can be used for free



9.2.1.4 Use of the infrastructure

In total 11 countries provided information regarding the use of the infrastructure, mainly regarding the use of (part of) the network services, applications and geo-portals: Belgium, Czech Republic, Denmark, Finland, France, Hungary, Norway, Poland, Slovenia, Spain and Sweden. The INSPIRE draft implementing rules foresee two indicators to measure the use and performance of the network services in the Member States. However, we could not test these indicators since the way countries are currently collecting information on the use of the infrastructure differs considerably, while information on the performance is not available at all (with exception of Norway). Table 4 provides an overview of the parameters collected by the different countries. Note also the differences in terminology.

Table 4: Units of measurement for use of the infrastructure

Country	Unit of measurement
Belgium	Number of views/month
Czech Republic	Number of unique visits/month Number of visits/month Number of pages/month Number of hits/month Volume/month (Gb)
Denmark	Number of hits/month Number of logins/year
Finland	Number of users/day Number of hits/day
France	Number of unique visitors/day Number of simultaneous connections Traffic peaks (Gbps)
Hungary	Number of users of systems and applications
Norway	Number of registered users Number of calls per week Traffic/day
Poland	Number of visitors/month Number of pages/month

Slovenia	Number of different users of the system Number of demands/year Number of records downloaded/year
Spain	Number of individual petitions/month Number of visits/month Number of viewed pages/month Average time/visit Number of countries making use of the services Number of requests/month (Navarra)
Sweden	Number of visitors/year

Because of the variable way of measuring, we will not compare the figures. The information received from the 11 countries has been integrated in the country reports. We give here only a few examples to illustrate the way countries are collecting and presenting information regarding the use of their infrastructure (geo-portals, services).

Table 5: Use of map services of the geo-portal of CENIA, CZ (2007)

Month	Unique visits	Number of visits	Pages	Hits	Volume
Jan 2007	11279	25638	1772783	3267970	61.08 GB
Feb 2007	11386	25881	1627600	2993173	65.91 GB
Mar 2007	12563	30362	1944208	3692749	59.71 GB
Apr 2007	12132	29592	2080486	3694688	113.67 GB
May 2007	13644	29944	2431265	4119587	115.43 GB
Jun 2007	20255	42273	7119174	10629110	192.08 GB
Jul 2007	17060	35493	5513160	8182489	174.30 GB
Aug 2007	18014	38165	6844417	9997506	179.77 GB
Sep 2007	15373	33746	3902444	5923602	122.98 GB
Oct 2007	18843	42790	5570368	8486964	197.08 GB
Nov 2007	22084	48138	6866306	10306416	229.22 GB
Dec 2007	14972	34409	4539565	6678887	176.27 GB
Total	187605	416431	50211776	77973141	1687.51 GB

Figure 13: Number of web requests for some components of IDENA, ES (2007)

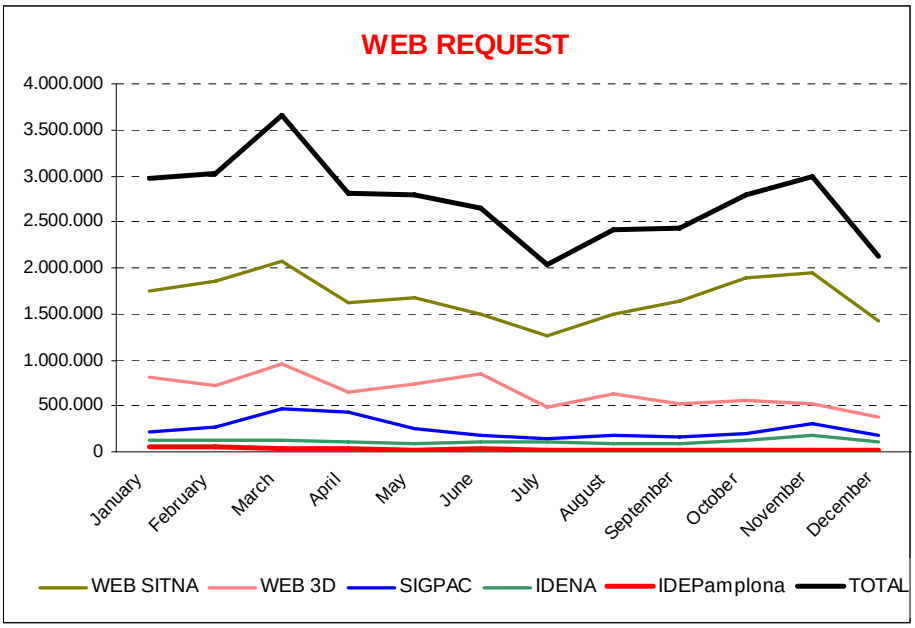
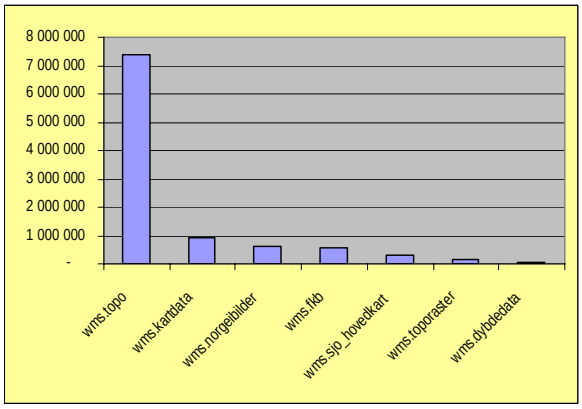


Figure 14: Number of hits for a day for some of the WMS services, NO



9.2.2 Data sharing practices

For the 2007 update of the INSPIRE State of Play country reports, a short survey was included based on questions from the Drafting Team on Data and Service Sharing (DT DSS). These questions were chosen to have a better view on existing data sharing practices, and to have a first indication on the level of coordination and harmonization that is already in place in the Member States or that would be feasible upon the implementation of INSPIRE. The results showed that there are possibilities for harmonization, but that the impact of a number of aspects of data sharing under INSPIRE is still unclear and will need more consideration.

The survey was completed by Belgium (on the federal level and for the Flemish region), Cyprus, Czech Republic, Denmark, Spain (on the federal level, Catalunya and Navarra), Finland, France, Iceland, Liechtenstein, the Netherlands, Norway, Portugal, Slovenia, and Slovakia.

Useful information was also received from Estonia, Denmark, Germany, Spain, Italy, Lithuania and Poland.

The survey showed that several of the countries are considering the coordination of the implementation of INSPIRE, and possibly their National Spatial Data Infrastructure. In a small number of countries (Cyprus, Portugal, Spain, Liechtenstein and Norway), a coordinating body is already in place. While in most countries there may be a body that could perform a coordinating function, but its role is still under discussion, or a body is under construction. In almost all the Member States that replied to the survey, this coordinating body is or would be installed on the national level, while a few Member States also saw a role for a sub-national body (Cyprus, Spain – Catalunya and Navarra).

In some of the countries where a coordinating body is already in place, this body can make agreements on behalf of the public authorities (Cyprus, Liechtenstein and Norway). The Czech republic will incorporate this in its new legislation, while Denmark and Finland also saw a possibility for this. Most countries did not have a clear view yet whether or not the coordinating body would be able to represent the public authorities in concluding agreements. This is also the case for the question whether the coordinating body could manage access or deliver data. However, Cyprus or Spain state that this would not be possible.

The second part of the survey addressed the terms and conditions for access of the public authorities to obtain access to and use of spatial data. First, the survey intended to examine whether the public sector is granted special terms or whether they acquire data on the same terms as the private sector does. From the countries that answered this question, a small majority has different terms and conditions for the public sector, including different prices or data that is only available for other public authorities. These countries include Belgium, Cyprus, Finland, France, Italy, Lithuania, Slovenia, Slovakia, and Norway. The countries that do not have special terms for the public sector, but apply the same conditions as for data requests from the private sector, are Czech Republic, Denmark, the Netherlands, Poland, Portugal, Iceland and Liechtenstein. This does not necessarily mean that these countries charge high prices or impose very strict conditions on the use of their data. In the Czech Republic for instance, many data sets are available free of charge, so neither the public nor the private sector would have to pay for it.

With regard to the harmonization of terms and conditions for spatial data sharing, the countries were asked whether it would be feasible to use a single model licence between public authorities for all public task use. Seven countries felt that this would be feasible: Denmark, Finland, the Netherlands, Spain, Iceland, Liechtenstein and Norway. In Finland this was proposed in the implementation plan, while the Netherlands considered this more as a long term goal. Portugal did not deem it feasible to have one single model licence, but felt that a minimal number of licences harmonizing the terms and conditions would be possible.

Article 17.7 of the INSPIRE directive allows the Member States to limit sharing of spatial data when this would compromise the course of justice, public security, national defence or international relations. The use the Member States make of this possibility can have a considerable impact on the extent of data sharing that can be realised under the INSPIRE. Therefore the survey asked the Member States to give examples of data themes for which they would want to limit data sharing based on these reasons. A considerable number of countries did not answer this question (Cyprus, Estonia, Germany, Italy, Lithuania, the Netherlands, Poland, Iceland, Norway). Interestingly, Czech Republic and Liechtenstein, and the Flemish Region in Belgium stated that no restrictions on data sharing would be made for these reasons. For the other countries that did answer the question (Belgium, Denmark, Finland, France, Portugal, Slovakia, Slovenia, and Spain), the data themes that were mentioned, were very diverse. The data themes that were mentioned more than once, are:

- transport networks (2),
- hydrography (2),
- land cover (2),
- orthoimagery (3),
- soil (2),

- land use (2),
- production and industrial facilities (6),
- management/restriction/regulation zones and reporting units (2),
- natural risk zones (2),
- energy resources (5),
- mineral resources (3).

Hence, the biggest concerns seem to lie with spatial data sets concerning production and industrial facilities (6 out of 8 countries) and energy resources (5 out of 8 countries). However, the reason why certain themes could fall under these restrictions, is not known.

According to article 17.6 of the INSPIRE directive, the Member States can accompany their data with national law requirements. If these requirements would differ greatly between the Member States, this could considerably hamper data sharing within and between the Member States and their public authorities. Of the 11 countries that answered the question (Belgium, Czech Republic, Denmark, Finland, France, Italy, Portugal, Slovenia, Slovakia, Spain, and Liechtenstein), only Czech Republic replied that no additional national requirements would be imposed. Out of the 11, 9 indicated that the protection of privacy and personal data would bring on national requirements. Next to Czech Republic, Portugal also doesn't consider this necessary. Intellectual property rights were mentioned by two countries, and other requirements that were named addressed national security, the official use of languages, no transfer to third parties and use restricted to the purpose mentioned in the licence.

The survey also attempted to find out the nature of the charging policies for the different data themes in the Member States. Three options were given for the countries to choose from:

- a level of charging reflecting the need of the data producer to be totally self-financing with no structural funding;
- a level of charging reflecting only the costs related to the distribution mechanisms (e.g. recovery of costs related to the set up of a download service, but basic collection and distribution costs are covered by other (structural) funding mechanisms);
- no charging, (as all costs are covered by a structural financing mechanism).

For many countries, this was difficult to answer for each of the 34 data themes. Eight countries which filled out the survey did not complete this question (Estonia, Germany, Italy, Lithuania, the Netherlands, Poland, Iceland and Norway). Some of the Member States gave a more detailed overview of their pricing policies, while others indicated that there was a mix of policies applicable to the provision of access to spatial data sets and services.

While Slovenia indicated that no charging is required for any of the data themes, and Slovakia and Liechtenstein stated that for all the data themes charges were made reflecting the costs related to the distribution mechanisms, the other countries presented a more diversified image. In Belgium, for instance, all datasets of the National Mapping Agency reflect partial self-financing and partial structural funding, while the only example of self-financing in the Flemish Region is the mid-scale road database. The standard procedure in Flanders is no charging. In Cyprus, some charges are made, but the aim is to keep it low. Finland stated that 40-50% of its data require charges reflecting self-financing, 30-40% charges for the distribution mechanisms, and 10-20% is free of charge. France, Portugal and Spain also report on variable situations. From the responses, not enough information can be derived to determine which level of charging is most common for which data themes.

In general, the survey shows that while coordination mechanisms are being put in place in most Member States that can play a role in harmonizing the terms and conditions for data sharing, currently these terms and conditions differ greatly between the Member States, both regarding the restrictions that can be made on data sharing and the charges that are required for the provision of data sets and services by the Member

States. The implementation of INSPIRE will require the Member States to seek clarity from their public authorities in order to obtain greater harmonization of these terms and conditions.

9.3 Results of the assessment of 32 countries

In this section we describe the results of the assessment of the 32 countries for 2007, as compared with the previous year 2006, and the evolution over time since the start of the study (2003). We review the typology for 2007 as well.

9.3.1 Summary overview of state of play autumn 2007

Table 6 contains a summary of the information compiled for the (N)SDI in 32 European countries as valid end of 2007. Colors indicate whether the studied (N)SDI are in large, partial or no agreement with the statements about the SDI-building blocks introduced in Section 8.2 and presented in Table 1 of that Section. The summary table for 2003, 2004, 2005 and 2006 is presented in Annex 13.2. Table 7 and 8 are change tables. Table 7 highlights the SDI building blocks for which the assessment in 2007 is different from the one in 2006. Table 8 highlights the differences between 2007 and 2003 (the starting period of the original SoP study).

As can be seen from the table, almost all countries studied are developing a truly national SDI. In a lot of cases, this is going hand in hand with the development of regional initiatives. Furthermore, it is clear that regarding legal issues and funding the fuzzy situation persist. Mostly because there is still no clear information available, or the legal status of the SDI has not been clarified yet in the respective countries (there exists a lot of legislation, but not directly related to the NSDI). This is confirmed by a survey of Eurogeographics (see http://www.eurogeographics.org) which reveals that e.g. no specific funding for NSDI development is foreseen. On the other hand, data, metadata and services are quite developed, especially in the 15 'old' Member States. The new Member States and candidate countries are working hard in this field too, and are sometimes at the same level of development as the 'old' Member States. Standardization is becoming a 'normal' issue, although one can see new efforts in some countries. Because of the additional (quantitative) information on network services, it became also clear that most countries are actively developing them: mostly discovery and viewing services, but also download services are becoming a point of attention. The transformation services are rare and focusing on coordinate transformation only.

If we look at the change matrix for 2005-2006, then one will note the following things:

- Two countries, i.e. Norway and Poland have shifted to another class regarding the degree of operationality: Norway scores now 6 instead of 5 (very well developed in all its components), while Poland has done considerable efforts which is reflected in the reporting and quantitative information.
- Due to the (re-) organizations and or the new organizational set-ups some countries score differently for the way the NSDI is led and/or for the involvement of its users. This is the case for Germany and the Czech Republic where the NMA is not the only player that coordinates (although in Germany the NMA is still playing a major coordinating role, they involve other key stakeholders more and more in this coordinating role as well – this evolution started for Germany already before); also in Spain, Italy, The Netherlands and Sweden, users are more and more involved in coordination.
- The changes regarding legal issues and funding are due to a second opinion (BE, BE-V), or due to new legislation and new policies (DE), to new model licenses (FR), new agreements (MT) or laws (CH), or because new information reached us (CY, IS).
- Two countries score worse on metadata availability (scoring less than 30% based on the information of the templates): i.e. FI and LI.

The fact that for some countries ‘no changes’ have been recorded does not mean that in other countries, no progress has been made: (1) countries which already were ‘in agreement’ for a lot of indicators can’t shift to another class anymore or/and (2) the changes could have been not significant enough to allow the shift to a higher class.

Table 6: Assessment of the building blocks of the NSDI, end 2007

Country	Organisational issues (I)							Legal issues and funding (II)								Data for the themes of the INSPIRE annexes (III)						Metadata (IV)			Network services (V)					Standards (VI)	Environmental data (VII)	Country
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	
AT		4																															AT
BE		3																															BE
BE-V		5																															BE-V
BE-W		4																															BE-W
DE		5																															DE
DK		5																															DK
ES		6																															ES
FI		5																															FI
FR		4																															FR
GR		2																															GR
IE		4																															IE
IT		4																															IT
LU		3																															LU
NL		5																															NL
PT		5																															PT
SE		5																															SE
UK		5																															UK
CY		3																															CY
CZ		5																															CZ
EE		3																															EE
HU		3																															HU
LT		4																															LT
LV		3																															LV
MT		2																															MT
PL		4																															PL
SI		4																															SI
SK		4																															SK
BG		2																															BG
RO		2																															RO
TR		1																															TR
CH		5																															CH
IS		4																															IS
LI		3																															LI
NO		6																															NO

In agreement
In partial agreement
Not in agreement
Unknown

Table 6: Assessment of the building blocks of NSDI, end 2007

9.3.2 Change table 2006-2007

Table 7: Changes between status of NSDI building blocks between 2006-2007

Country	Organisational issues (I)							Legal issues and funding (II)									Reference data & core thematic data (III)						Metadata (IV)			Network services (V)					Standards (VI)	Environmental data (VII)	Country
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	
AT																																	AT
BE																																	BE
BE-VL																																	BE-VL
BE-W																																	BE-W
DE																																	DE
DK																																	DK
ES																																	ES
FI																																	FI
FR																																	FR
GR																																	GR
IE																																	IE
IT																																	IT
LU																																	LU
NL																																	NL
PT																																	PT
SE																																	SE
UK																																	UK
CY																																	CY
CZ																																	CZ
EE																																	EE
HU																																	HU
LT																																	LT
LV																																	LV
MT																																	MT
PL																																	PL
SI																																	SI
SK																																	SK
BG																																	BG
RO																																	RO
TR																																	TR
CH																																	CH
IS																																	IS
LI																																	LI
NO																																	NO

In better agreement than in 2006
In much better agreement than in 2006
In less agreement than in 2006
Change due to removal of 'unknown', error correction or second opinion

Table 7: Changes between status of NSDI building blocks between autumn 2006 and end 2007

9.3.3 Change table 2003-2007

Table 8: Changes between status of NSDI building blocks between 2003 and 2007

Country	Organisational issues (I)							Legal issues and funding (II)									Reference data & core thematic data (III)						Metadata (IV)			Access services (V)					Standards (VI)	Environmental data (VII)	Country
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	
AT																																	AT
BE																																	BE
BE-V																																	BE-V
BE-W																																	BE-W
DE																																	DE
DK																																	DK
ES																																	ES
FI																																	FI
FR																																	FR
GR																																	GR
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NL																																	NL
PT																																	PT
SE																																	SE
UK																																	UK
CY																																	CY
CZ																																	CZ
EE																																	EE
HU																																	HU
LT																																	LT
LV																																	LV
MT																																	MT
PL																																	PL
SI																																	SI
SK																																	SK
BG																																	BG
RO																																	RO
TR																																	TR
CH																																	CH
IS																																	IS
LI																																	LI
NO																																	NO

- In better agreement than in 2003
- In better agreement than in 2003, twice changed
- In less agreement than in 2003
- Change due to removal of 'unknown', error correction or second opinion
- Twice changed due to removal of 'unknown', error correction or second opinion
- No change compared to 2003

Table 5: Changes between status of NSDI building blocks between spring 2003 and spring 2007

9.3.4 Typology autumn 2007

The classification rules set out in Section 8.1.3 lead, for 2003, 2004, 2005 and 2006, to the typology presented in Annex 11.3. Based on the updated information in the country reports for 2007, table 9 is obtained.

Like for 2003, 2004, 2005 and 2006, countries are divided over two distinct groups. In countries of the first group, a NDP (NMA or a similar type of agency like a National Land Service, Cadastral Agency, ...) is the officially mandated or de facto leading organization for the establishment of the NSDI. At a second level, the further involvement of associations or communities of data users in the coordination activities is taken into account. Involvement in this respect means that user organizations are present in bodies defining the mandate of the lead agency for the NSDI and/or advising upon the NSDI-projects. Finally the degree of operationality of the SDi-initiative, i.e. whether one or more of its components are operational or whether the NSDI is rather in the planning stage, is considered.

The second group of countries have NSDI-initiative(s) led by a council of ministries or administrative departments, by a (non governmental) GI-association or other type of partnership of mainly data users. This group is further subdivided according to the presence or absence of a legal or otherwise formal mandate for the SDI-coordination. At the third level, the operationality of the initiative is used as a discriminating factor.

Table 9: Classification of countries according to NSDI type (2007)

Level I	Level II	Level III	EU-27	CC(-1)	EFTA-4	Class
NDP-led	users involved	operational	DK, FI, SE, PT, HU		IS, NO	1,1,1
		partially operational	AT, GR, LU, PL			1,1,2
		not operational	BE, **RO**			1,1,3
	users not involved	operational	SI, SK, LT			1,2,1
		partially operational	EE, LV, CY		LI	1,2,2
		not operational	MT, BG	TR		1,2,3
not NDP-led	formal mandate	operational	BE-VL, DE, **ES, NL**, CZ		CH	2,1,1
		partially operational	IT, IE			2,1,2
		not operational				2,1,3
	no formal mandate	operational	UK, BE-WA			2,2,1
		partially operational	FR			2,2,2
		not operational				2,2,3

The most important changes in the table relate to the fact that both NL and ES are now classified as having a formal mandate for SDI development. This is related to the considerable organisational developments over the last 1.5 years – even if there is not (yet) a legislation in place that confirms this. RO is reclassified as 'users involved' based on the information of the practices over the last 1.5 year as well. The other countries were not re-classified.

We wander if the typology will continue to give enough differences between countries. Indeed, due to the mandatory INSPIRE implementation, and the de facto involvement of more and more stakeholders, also in the coordination, most of the discriminating factors will become obsolete.

10. CONCLUSIONS AND RECOMMENDATIONS

In this chapter we first list some of the recommendations that were made in previous years, but that are still relevant. Secondly we list some conclusions and new recommendations, both regarding the development of INSPIRE as such, as with regard to the methodology and further development of the Implementing Rules for monitoring and reporting.

10.1 Previous recommendations to reconsider

Some of the recommendations described in previous summary reports remain still valid. We list them here since it would be useful to pay particular attention to (at least some of) them:

- *The current status of development of the (N)SDI and INSPIRE as a whole has revealed the need to create awareness and to pay more attention to education/training. This is a crucial issue for further development of INSPIRE and underestimated so far. This is important at different levels and relevant for the whole stakeholder community: developers of (building blocks of) (N)SDI, expert GI users, the broader user community; the public authorities, academic and private sector. (N)SDI necessitates another way of using spatial data, but also another way of developing applications or information systems. Very few stakeholders are ready for this. The training centres, universities and other educational facilities are not ready for this huge task (with a few exceptions). Creation of awareness is also important to let the broader user community know that an infrastructure (or parts thereof) exists and is ready to be used.*

  We propose to look to some European funded projects where these issues are tackled: e.g. Humboldt (looking into data harmonisation and related training), VESTA-GIS (looking into INSPIRE training needs).

- *Around Europe, there are several examples of good practice (there is not one 'perfect' model). It is important to collect these "stories". This is not part of the current state of play. In a first step, the different (N)SDI could be asked in which field they think help is needed and for which those examples of good practice could be a (practical) help. Along with the technical guidelines which will (should) see light with the work from the Drafting Teams, there is also a need for organisational guidelines. Another way of learning from good practices is the organisation of (bilateral) exchange of SDI experts. They could work for a certain period within another (N)SDI to learn about the way of working, the technical approaches, etc (kind of stages).*

  We propose to look into some ongoing European funded projects like eSDI-Net+ (eContentPlus network for Best Practices), VESTA-GIS (includes a mobility framework).

- *Several countries have good experience in collaboration with the private sector. In other countries private sector is not involved at all. It would be good to make special efforts to involve the private sector. This could be more then only as contractor for building datasets or services. For the latter, their role is of course clear. But the private sector could also be interested as a user of the infrastructure, as contributor to host building blocks of the SDI, to integrate/link own data, etc. EUROGI could look into more detail how the private sector can be involved in different countries.*

10.2 Conclusions and new recommendations

We can make some pertinent conclusions based on the update of the State of Play for 2007:

- The collection of information.

  There are several gaps in the information collected through the templates. 21 countries filled in the template with information on data sets, and 20 of them filled in the template with information on services as well. One country (DK) said it was too much work to fill in the templates, especially because of the complexity of the situation at the local level. Some of the countries that filled in the templates did this only partially: due to a lack of time (in some cases) or because not all the stakeholders could be involved, especially those that are responsible for Annex III data sets. In some cases, the content of what the theme covers is unclear; or it is not known who is responsible for the theme.

  Also the way of filling in the templates varies from country to country. Some countries did that more roughly, e.g. without giving a clear ID/name for data sets or services. Sometimes characteristics are filled in for several data sets together which necessitates interpretation. Countries like PT selected only those data sets and services that they deem to be 'INSPIRE compliant', indicating that the NSDI contains a lot more. Therefore, the resulting indicators score high.

  It should also be stressed that within the given time frame neither the data sets, nor the services could be checked.

  - It is advisable to prepare on-line templates for filling the information and guide the countries when entering information (adding some constraints).
  - Countries should be stimulated to bring together stakeholders who host/maintain (parts of) the infrastructure, and certainly those that are responsible for it.
  - It is also advisable to store this information in a central register which is useful for both Member States and the EU.
  - There is a clear need for good guidelines which can also evolve and further developed over time.

- The calculation of the indicators.

  Once the raw data are collected, the 2007 exercise has proven to be straightforward. Most of the indicators that could be calculated (for some of the indicators the survey did not yet provide the necessary information). Calculation was now done 'manually', i.e. by going through the filled templates for each country, 'interpreting' the information when not clear (e.g. assuming that if metadata for data sets were not reported, they are not existing – empty space) and counting data sets/services.

  In the 2007 exercise, the existence of network services (one of the DT MR indicators) was applied differently since this information was only indirectly available in the templates leaving too much room for interpretation.

  The calculation of the indicators on usage and performance of the services could not take place neither since the information provided by the countries is too variable. This will of course (eventually) change when Member States will receive clear guidelines and/or when IR are in place which define exactly how this should be done.

  - Online templates will make it possible to automate the calculations.
  - It is proposed to include in the next exercise a discriminating factor for the services, i.e. taking into account only those services that have metadata compliant with the IR (or ISO).
  - Also in the next exercise, data sets should be reported according to their coverage in order to calculate the existence of data for the

themes of the annexes as proposed by the DT MR. This has not been done in the 2007 update in order not to overload the countries for this first exercise.

- It is necessary to fix IR and/or guidelines for the way information on usage and performance is collected. It might be useful to bring Member States together to discuss and compare their experience and to discuss what is feasible at network service level.

- Assessment over time, comparing results from the reviewed approach

  The mapping as proposed in the summary report of 2006 became partially obsolete: the indicators for coordination/cooperation and data sharing are not withheld which makes that only indicators related to the technical infrastructure and the use/performance of services remain listed (the latter were never monitored in the original approach of the state of play).

  It is felt that a complete mapping is not possible and that some of the 'old' indicators should be collected also in the future in order to be able to prepare complete matrices as they were conceived in the original approach.

  What can be done is to use the quantified information on data sets, metadata and services as input for some thresholds to agree, partially agree or disagree with some of the indicators of the SoP (e.g. the three countries which reported to have for less than 30% of the data sets metadata were interpreted as in 'partial agreement'). Another option would be to indicate the calculated indicator in the matrix (%).

  - It is proposed to discuss the possible thresholds for all the indicators during the next assessment exercise.

- Typology

  With the further development of the NSDI in Europe, largely influenced by the INSPIRE process, it becomes clear that the differences between the NSDI (organisational) are less and less important: coordination is more and more a joined issue of NMAs, users and other stakeholders; once the transposition phase is finished (probably) all the Member States will have formal mandates for this coordination body, etc.

  - Therefore the typology becomes more and more obsolete (and disappear) or should at least be reviewed.

- Data sharing

  Information on data sharing was collected through a series of questions. It seemed that the questions were, or not clear enough, or countries do not have (yet) a clear data sharing policy. The questions were also very particular which made the answer less useful for the overall assessment. The answers are also rather fragmented.

  However, certain elements were raised by several countries which deserves our attention: (1) coordinating structures are currently being set up, but a clear data policy is not yet in place in most cases; (2) the possibility of invoking one or more of the reasons mentioned in the Directive to limit access or use of certain spatial data sets was mentioned by several countries and this for a variety of themes of the annexes. Even for some themes where one would not expect it.

  - There is a need to further clarify how this potential limitation of access and use might take or not take place. Clarification is needed at the legal level, as well as at the technical level (e.g. we refer to the discussion on sensitiveness of nature protection information which can be implemented by using filter mechanisms without prohibiting access to the data sets as such). It might be useful to organise a workshop on this topic to clarify things.

  - Although the DT MR did not withheld indicators to measure data sharing, and although it was felt that this remains a key issue for successfully implementing INSPIRE, it is proposed to further

investigate this. A possibility would be to further elaborate possible indicators which would be calculated on the basis of the information in the country reports (at EU level) when assessing the results coming in from the Member States. Another option is to propose alternative approaches. This issue could be discussed in workshops and some pilots could test the feasibility.

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- All other experts who have provided input to the country reports, and have directed us towards new documents, Internet sites and other relevant material;
- Many of the participants to the INSPIRE Conference in Porto (July 2007) who during and after the meetings have provided valuable suggestions and information for completion of the summary and the country reports.
- Several INSPIRE stakeholders – users of GI, as well as developers of services – have also inspired and given valuable input to this study.

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13. ANNEXES

13.1 Regular country reports

The 32 country reports are separate documents available in printed form, as .DOC or .PDF-files. The naming convention for the digital documents is the following:

Rcr07COUNTRYCODEvX.doc or rc07rCOUNTRYCODEvX.pdf

with

- Rcr07 standing for 'regular country report 2007'
- vX standing for the version number, e.g. v4
- COUNTRY CODE as in Annex 11.5

13.2 Summary overview for 2003, 2004, 2005 and 2006

Table 10: Status of the 32 NSDI in 2003

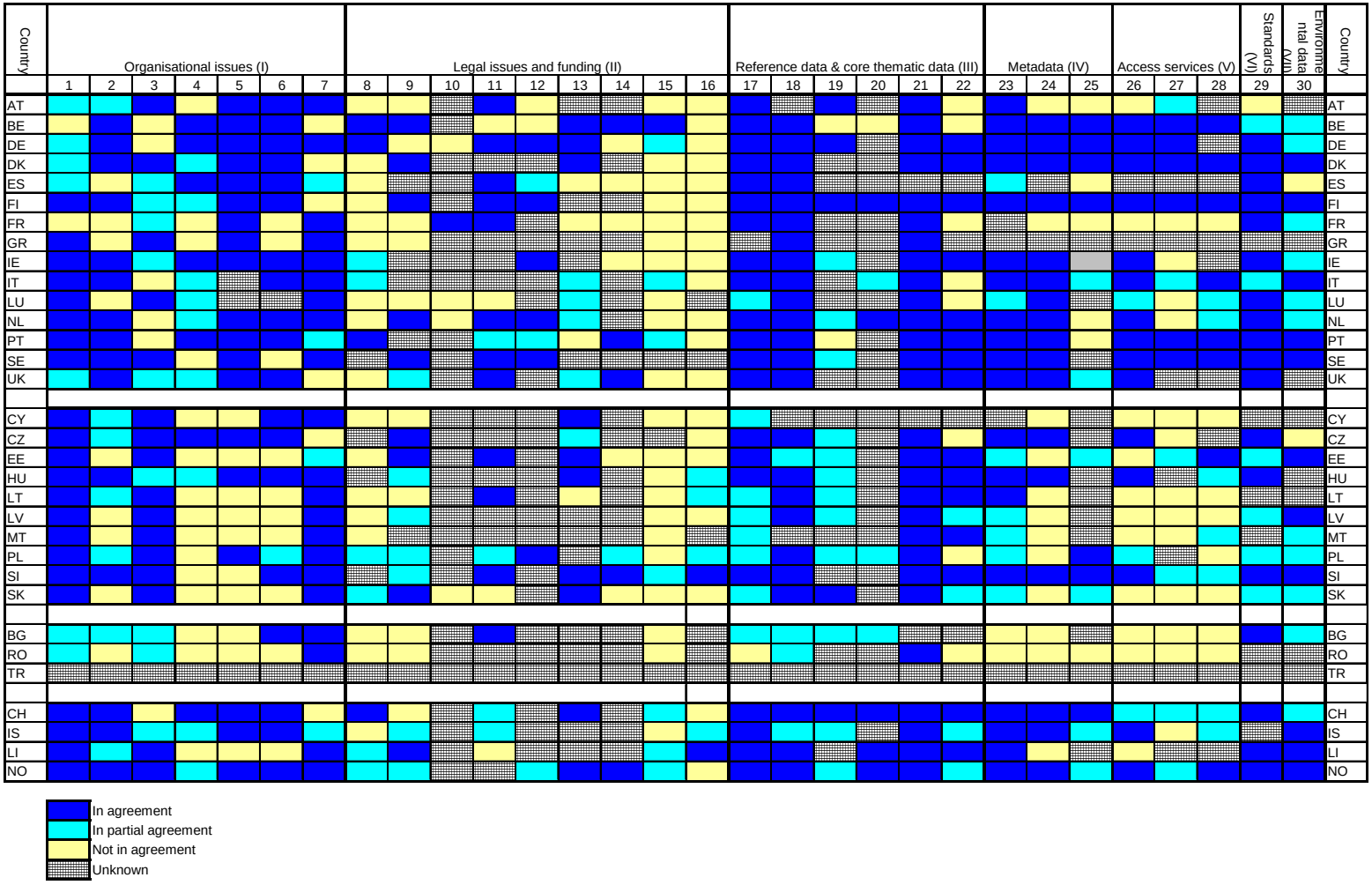


Table 11: Status of the 32 NSDI in 2004

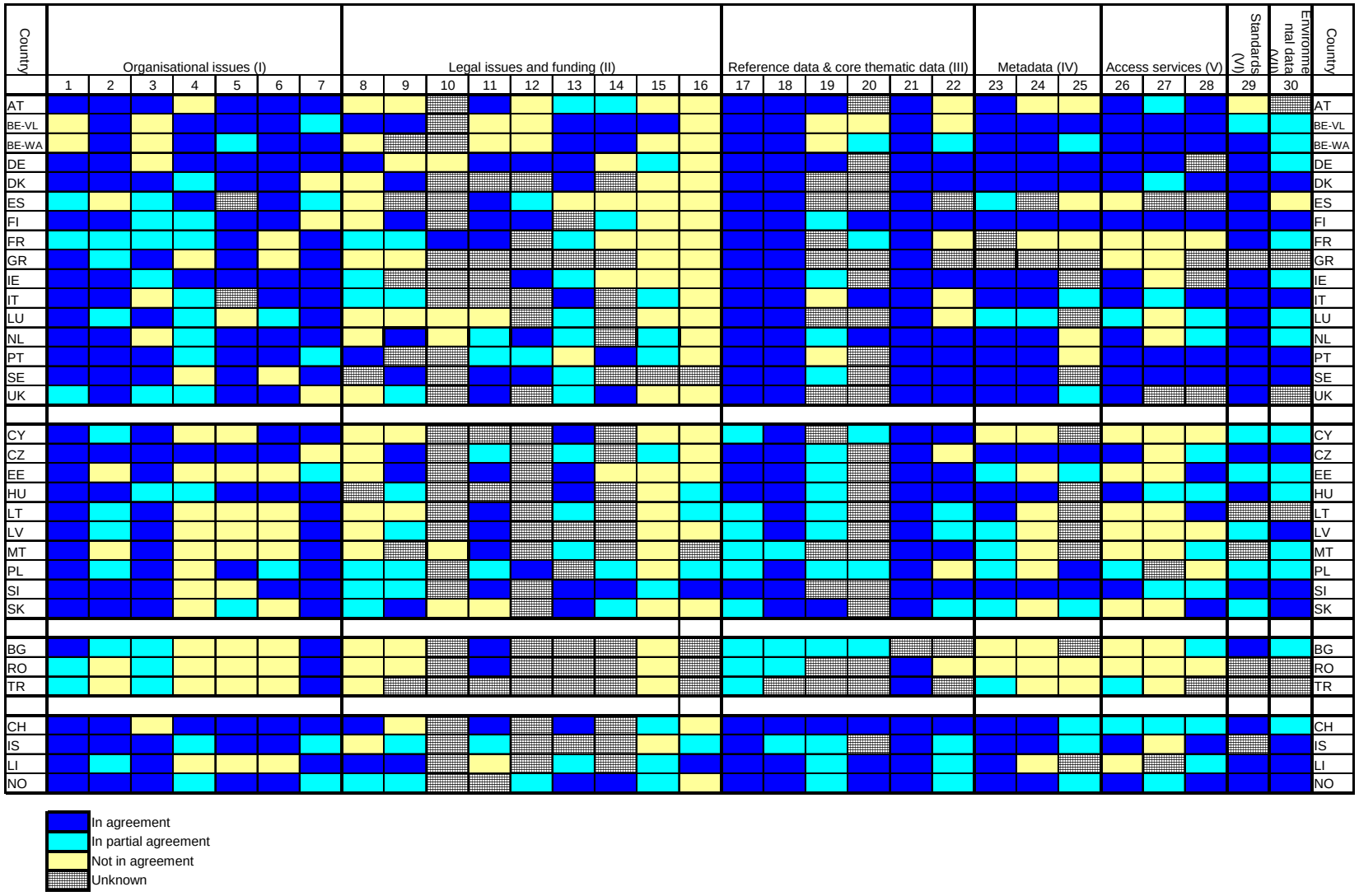


Table 12: Status of the 32 NSDI in 2005

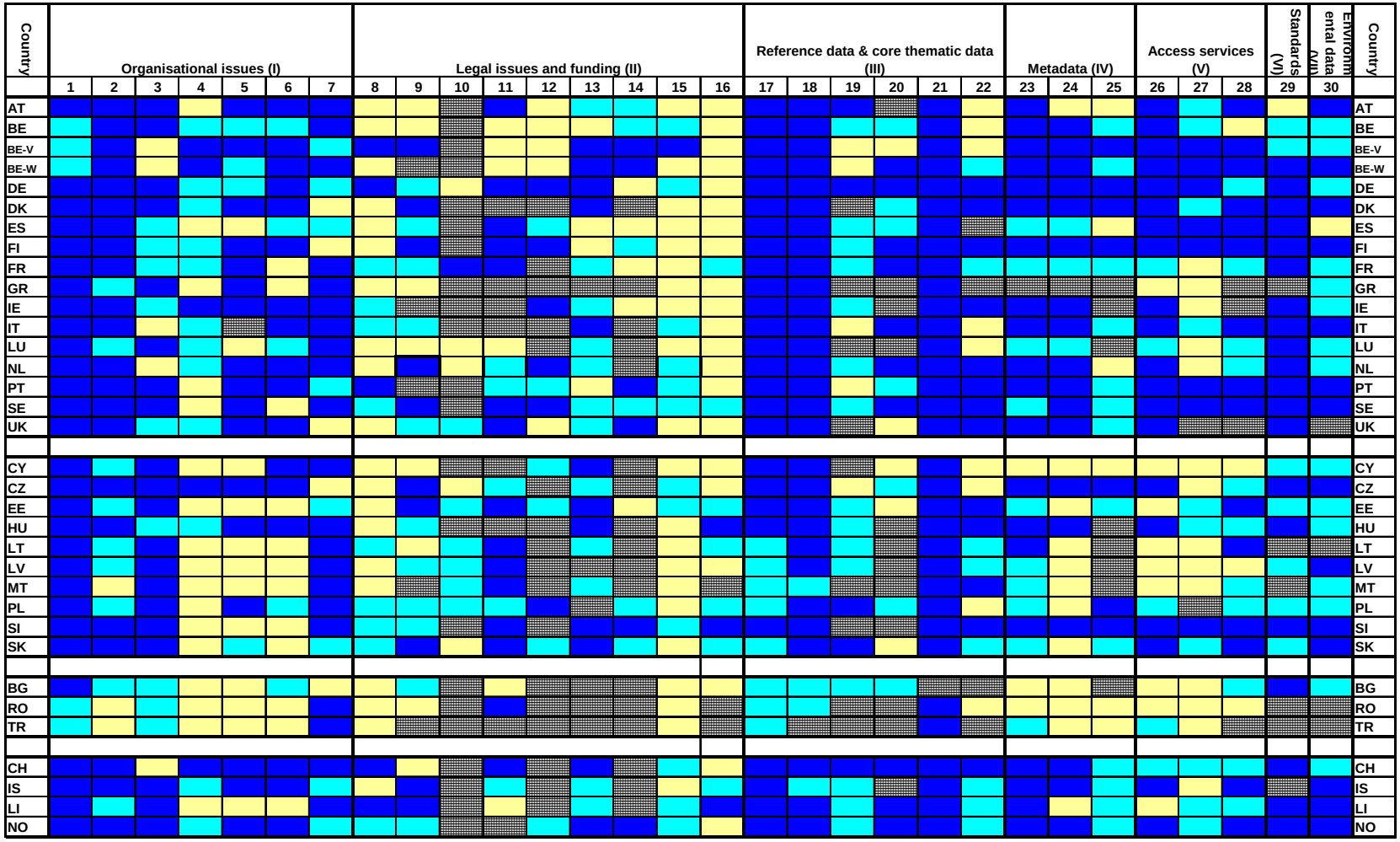
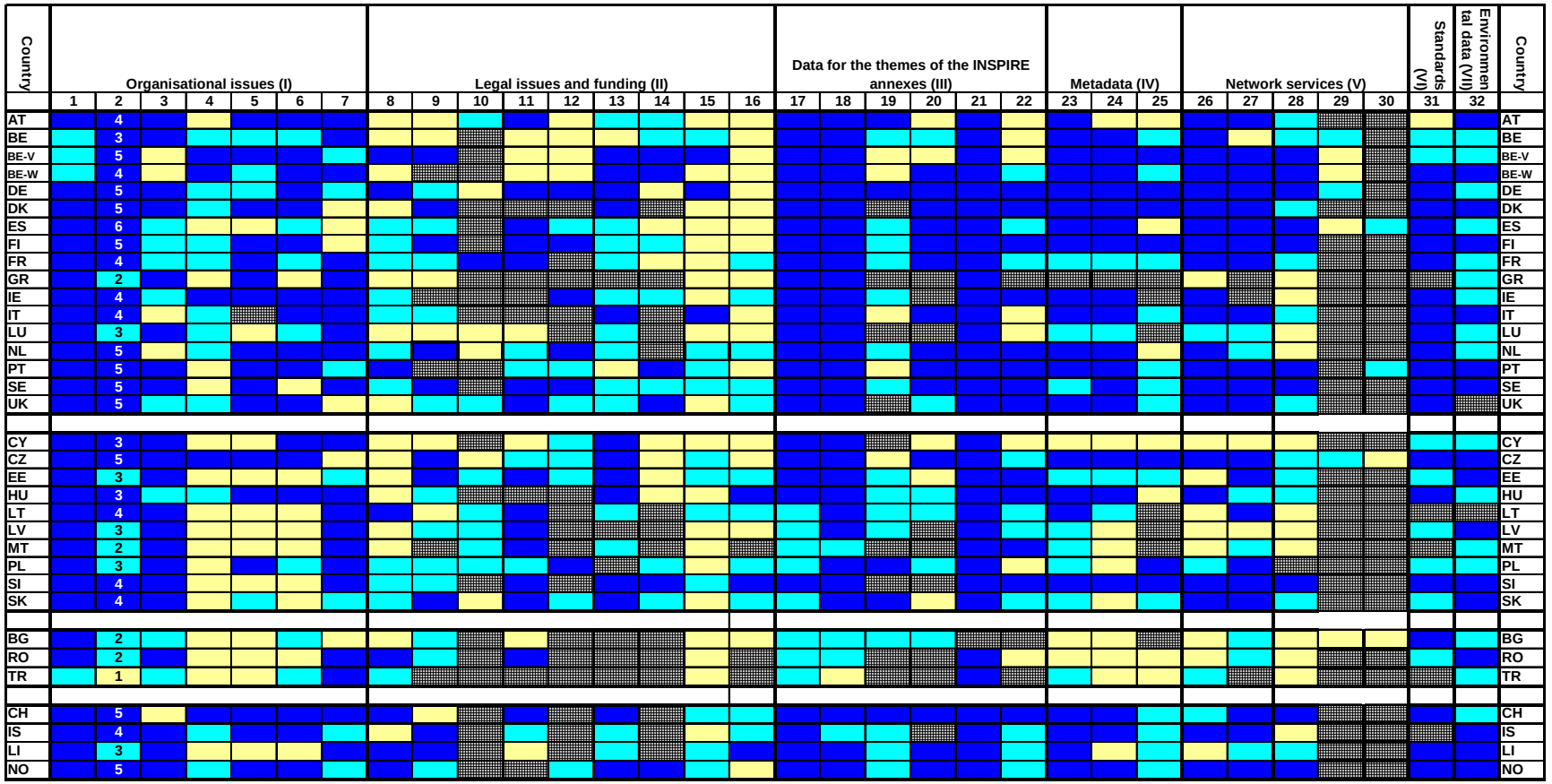


Table 2: Assessment of the building blocks of NSDI, spring 2005

Table 13: Status of the 32 NSDI in 2006



13.3 Typology for 2003, 2004, 2005 and 2006

Tables are taken from previous reports for the corresponding years.

Table 14: Typology of 32 NSDI for 2003

Level I	Level II	Level III	EU-15	EU+10	EFTA-4	Class
NDP-led	users involved	operational	DK, FI, SE	HU	IS, NO	1,1,1
		partially operational	AT,	CZ, PL		1,1,2
		not operational	GR, LU			1,1,3
	users not involved	operational		SI		1,2,1
		partially operational		LT	LI	1,2,2
		not operational		EE, LV, MT, SK		1,2,3
not NDP-led	formal mandate	operational	BE-VL, DE, PT		CH	2,1,1
		partially operational	IE, IT			2,1,2
		not operational				2,1,3
	no formal mandate	operational	NL, UK			2,2,1
		partially operational	BE-WA			2,2,2
		not operational	ES, FR			2,2,3

Table 15: Typology of 32 NSDI for 2004

Level I	Level II	Level III	EU-15	EU+10	CC-3	EFTA-4	Class
NDP-led	users involved	operational	DK, FI, SE, **PT**	HU, **CZ**		IS, NO	1,1,1
		partially operational	AT, **GR, LU**	PL			1,1,2
		not operational					1,1,3
	users not involved	operational		SI			1,2,1
		partially operational		LT, **SK**		LI	1,2,2
		not operational		EE, LV, MT, *CY*	*RO, BG, TR*		1,2,3
not NDP-led	formal mandate	operational	BE-VL, DE, I**T, IE**			CH	2,1,1
		partially operational					2,1,2
		not operational					2,1,3
	no formal mandate	operational	NL, UK, **BE-WA**				2,2,1
		partially operational	**FR**				2,2,2
		not operational	ES				2,2,3

Table 16: Typology of 32 NSDI for 2005

Level I	Level II	Level III	EU-15	EU+10	CC-3	EFTA-4	Class
NDP-led	users involved	operational	DK, FI, SE, **PT**	HU, **CZ**		IS, NO	1,1,1
		partially operational	AT, **GR, LU, BE**	PL			1,1,2
		not operational					1,1,3
	users not involved	operational		SI, SK			1,2,1
		partially operational		LT		LI	1,2,2
		not operational		EE, LV, MT, *CY*	*RO, BG, TR*		1,2,3
not NDP-led	formal mandate	operational	BE-VL, DE, I**T, IE**			CH	2,1,1
		partially operational					2,1,2
		not operational					2,1,3
	no formal mandate	operational	NL, UK, **BE-WA**				2,2,1
		partially operational	**FR, ES**				2,2,2
		not operational					2,2,3

Table 17: Typology of 32 NSDI for 2006

Level I	Level II	Level III	EU-15	EU+10	CC-3	EFTA-4	Class
NDP-led	users involved	operational	DK, FI, SE, PT	HU		IS, NO	1,1,1
		partially operational	AT, GR, LU	PL			1,1,2
		not operational	**BE**				1,1,3
	users not involved	operational		SI, SK, **LT**			1,2,1
		partially operational		**EE, LV, CY**		LI	1,2,2
		not operational		MT	RO, BG, TR		1,2,3
not NDP-led	formal mandate	operational	BE-VL, DE	**CZ**		CH	2,1,1
		partially operational	**IT, IE**				2,1,2
		not operational					2,1,3
	no formal mandate	operational	NL, UK, BE-WA, **ES**				2,2,1
		partially operational	FR				2,2,2
		not operational					2,2,3

13.4 Country codes

Table 18: Acronyms for countries

EU-25	
AT	Austria
BE	Belgium
DE	Germany
DK	Denmark
ES	Spain
FI	Finland
FR	France
GR	Greece
IE	Ireland
IT	Italy
LU	Luxembourg
NL	The Netherlands
PT	Portugal
SE	Sweden
UK	United Kingdom
CY	Cyprus
CZ	Czech Republic
EE	Estonia
HU	Hungary
LT	Lithuania
LV	Latvia
MT	Malta
PL	Poland
SI	Slovenia
SK	Slovak Republic
BG	Bulgaria
RO	Romania
Candidate Country	
TR	Turkey
EFTA countries	
CH	Switzerland
IS	Iceland
LI	Liechtenstein
NO	Norway
Non-European countries	
AU	Australia
CA	Canada
US	United States of America

13.5 Template data sets

Table 19: Data sets ANNEX I

Data sets ANNEX I						
	Theme[9]	**Data set[10]**	**Organisation responsible**	**Scale/resolution**	**Metadata (N/Y/ISO)[11]**	**Can be discovered, viewed, downloaded[12]**
I-1	Coordinate Reference Systems[13]					
I-2	Geographical grid systems (harmonised multi-resolution grid)					
I-3	Geographical names					
I-4	Administrative units (local, regional and national boundaries)					
I-5	Addresses					
I-6	Cadastral parcels					
I-7	Transport networks (road, rail, air, water and links between networks)					
I-8	Hydrography (including marine areas, all water bodies, river basins, etc.)					
I-9	• Protected sites (designated					

[9] See also description of the data themes in document D2.3 Definition of Annex Themes and Scope (http://www.ec-gis.org/INSPIRE)

[10] Name the data set. Can be a database with multiple layers and thus including several themes, or a specific data set which covers part of a theme (e.g. Natura 2000), you can also have several data sets with the same information at different scales/resolutions. Please only include only the 'basic' data sets (e.g. generalised versions derived from large scale base data sets should not be included)

[11] Indicate whether the data set has no metadata (N), metadata but not according to the ISO 19115 standard (Y), or metadata according to ISO 19115 (ISO).

[12] Can the data set be discovered (1), viewed (2), downloaded (3) through at least one such standardised service? Indicate this using the numbers (1,2,3)

[13] This is of course not necessarily a real data set.

	by national, EU or international legislation)					

Table 20: Data sets ANNEX II

Data sets ANNEX II						
	Theme[14]	**Data set[15]**	**Scale/resolution**	**Organisation responsible**	**Metadata (N/Y/ISO)[16]**	**Can be discovered, viewed, downloaded[17]**
II-1	Elevation (land, ice and ocean surfaces; terrestrial elevation, bathymetry, shoreline)					
II-2	Land cover (physical and biological)					
II-3	Orthoimagery (geo-referenced image data)					
II-4	• Geology (including bedrock, aquifers and geomorphology)					

[14] See also description of the data themes in document D2.3 Definition of Annex Themes and Scope (http://www.ec-gis.org/INSPIRE)

[15] Name the data set. Can be a database with multiple layers and thus including several themes, or a specific data set which covers part of a theme (e.g. Natura 2000), you can also have several data sets with the same information at different scales/resolutions. Please only include only the 'basic' data sets (e.g. generalised versions derived from large scale base data sets should not be included)

[16] Indicate whether the data set has no metadata (N), metadata but not according to the ISO 19115 standard (Y), or metadata according to ISO 19115 (ISO).

[17] Can the data set be discovered (1), viewed (2), downloaded (3) through at least one such standardised service? Indicate this using the numbers (1,2,3)

Table 21: Data sets ANNEX III

Data sets ANNEX III						
	Theme[18]	**Data set[19]**	**Scale/resolution**	**Organisation responsible**	**Metadata (N/Y/ISO)[20]**	**Can be discovered, viewed, downloaded[21]**
III-1	Statistical units (for dissemination or use of statistical data)					
III-2	Buildings (geographical location of buildings)					
III-3	Soil (and sub-soil characteristics)					
III-4	Land use (e.g. residential, industrial, commercial,					
III-5	Human health and safety (see full description in Annex)					
III-6	Utility and governmental services (sewage, waste management, energy, etc.)					
III-7	Environmental monitoring facilities (emissions, ecosystem parameters)					
III-8	Production and industrial facilities (water abstraction, mining, storage sites)					
III-9	Agricultural and aquacultural facilities					
III-10	Population distribution - demography					

[18] See also description of the data themes in document D2.3 Definition of Annex Themes and Scope (http://www.ec-gis.org/INSPIRE)

[19] Name the data set. Can be a database with multiple layers and thus including several themes, or a specific data set which covers part of a theme (e.g. Natura 2000), you can also have several data sets with the same information at different scales/resolutions. Please only include only the 'basic' data sets (e.g. generalised versions derived from large scale base data sets should not be included)

[20] Indicate whether the data set has no metadata (N), metadata but not according to the ISO 19115 standard (Y), or metadata according to ISO 19115 (ISO).

[21] Can the data set be discovered (1), viewed (2), downloaded (3) through at least one such standardised service? Indicate this using the numbers (1,2,3)

III-11	Area management / restrictions / regulation zones / reporting units					
III-12	Natural risk zones (e.g. atmospheric, hydrologic, seismic, volcanic, wildfire)					
III-13	Atmospheric conditions					
III-14	Meteorological geographical features (weather conditions, measurements)					
III-15	Oceanographic geographical features (currents, salinity, wave heights, etc.)					
III-16	Sea regions (physical conditions of seas and saline water bodies)					
III-17	Bio-geographical regions (areas with homogeneous ecological conditions)					
III-18	Habitats and biotopes (geographical areas for specific ecological conditions)					
III-19	• Species distribution (geographical boundaries for animal and plant species)					
III-20	• Energy resources (hydrocarbons, hydro-power, bio-energy, solar, wind, etc.)					
III-21	• Mineral resources (metal ores, industrial minerals depth/height)					

13.6 Template services

Table 22: Services

Services						
	Service[22]	**Organisation responsible**	**Type of service[23]**	**Metadata (N/Y/ISO)[24]**	**Open for Public (Y/N)**	**Free/Not free[25] (Y/N)**
	•					
	•					
	•					
	•					
	•					
	•					

[22] List the names/IDs and where possible the link (URL) of all the discover, view, download, transformation and invoking services that are part of your infrastructure
[23] Indicate the type (discover, view, download, transformation and invoking services)
[24] Indicate whether the service has no metadata (N), or metadata according to ISO 19119 (ISO).
[25] Whether or not the service is free for use.