JRC TECHNICAL REPORTS

INSPIRE Public Consultation 2014

Report of Findings

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Executive Summary

This report presented the findings of the public consultation on INSPIRE organised by the European Commission in December 2013-February 2014. Almost 700 responses were received to the consultation from public and private sector, academia, and private citizens.

The key messages from the public consultation are:
- INSPIRE is starting to work and address the key barriers identified at the outset of this initiative that prevented the sharing and use of the spatial information needed to support environmental policies and policies affecting the environment.
- Most progress has been done in documenting data, and making such data discoverable and viewable through web services. There are however delays, particularly for Annex I and II data that should all have become available by the time of the survey. Delays are also present for Annex III, both for completing the metadata and for making data available via download services.
- The area of greater concern is the delay by the Member States in putting in place measures necessary to remove obstacles to the sharing of data at the point of use among public administrations. Only about half of the data producers indicated that such policy measure had been put in place in their organisation, and this was felt by users still finding data policy as a major barrier. Taking into consideration that such measures should have been in place since 2009, this delay is clearly significant.
- Improving communication, and sharing of best practice, reducing as far as possible complexity of technical specifications, and improving coordination are key suggested changes.
- There was almost unanimous view across all participants in the public consultation that the objectives of INSPIRE of making spatial data and services more easily shared and used are still as pertinent as ever.
- INSPIRE is delivering benefits to public administrations through improved data management processes and increased skills/competences in managing and publishing geographic information and related services.

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1 Scope

This report analyses the results of the web-based public consultation launched by the European Commission between December 2013 and February 2014 as part of the mid-term review of the INSPIRE Directive.

2 Policy Context

The Infrastructure for Spatial Information in Europe (INSPIRE) is a European Directive (2007/2/EC) adopted in 2007 to address a number of important obstacles preventing the widespread use of spatial data needed for environmental policies and policies having an impact on the environment. These obstacles are:

1. Spatial data is often missing or incomplete.
2. The description (documentation) of available spatial data is often incomplete.
3. Spatial datasets can often not be combined with other spatial datasets.
4. The systems to find, access and use spatial data often function in isolation only and or not compatible between each other.
5. Cultural, institutional, financial and legal barriers prevent or delay the sharing and re-use of existing spatial data.

INSPIRE sets out to address these issues by creating an infrastructure in which the spatial data and services necessary for environmental policy and policies having an impact on the environment (which are organised in 34 themes in the Annexes I, II and III of the Directive) are:

1. Shared between public authorities at all levels of government, within – and across borders, for public tasks that have an impact on the environment without restrictions at the point of use.
2. Documented with harmonised metadata.
3. Made discoverable, viewable, and accessible and downloadable through internet-based services for both the public and public authorities.
4. Are organised on the basis of common spatial data and service specifications in the ICT systems of the public administrations.
5. Adequately coordinated through a governance approach involving all stakeholders.

It should be noted that INSPIRE does not address the problem of missing or incomplete spatial data as it does not require the collection of new data.

According to Article 23 of the INSPIRE Directive, the Commission has to present by 15 May 2014 and every six years thereafter a report evaluating the implementation of INSPIRE to the European Parliament and to the Council. This evaluation report is based on multiple sources of information and methodologies including:

1. The 3-yearly reports prepared by the Member States
2. Review of secondary sources (studies, reports, presentations at conferences)
3. An independent study of the extent of implementation in the Member States
4. A public consultation.

This report analyses the responses to the public consultation

2.1 *Elements of INSPIRE*

INSPIRE has been designed as a framework directive, with general obligations and rights as well as rules meant to support its implementation. The rights and obligations laid down in the INSPIRE and its Implementing Rules (IRs) for meeting the above objectives have an implementation calendar that spans to 2020. The INSPIRE IRs address the following specific issues:

- The **metadata (MD)** IRs[1] specify a number of common metadata elements to be provided for all resources (spatial data sets and services) within the scope of INSPIRE in order to facilitate their discovery (across languages and borders) within the INSPIRE infrastructure.

- The **network services (NS)** IRs[2] specify common interfaces for web services for discovering, viewing, downloading and transforming spatial data sets. Based on these common interfaces, generic client applications can be developed that allow users to search for INSPIRE data sets, to download them or to visualise them in interactive maps.

- The **interoperability of spatial data sets and services (ISDSS)** IRs[3] specify common data models, code lists, map layers and additional metadata (for evaluation and use) to be used when exchanging spatial data sets. These IRs provide the semantic interoperability layer and ensure that users of data can unambiguously interpret the data they are accessing through the network services.

- The **data and service sharing (DSS)** IRs[4] define the conditions under which Member States shall provide the institutions and bodies of the Union with access to spatial data sets and services in accordance with harmonised conditions.

- The **monitoring and reporting (M&R)** IRs[5] specify the rules on monitoring by Member States of the implementation and use of their infrastructures for spatial information and on reporting on the implementation of Directive 2007/2/EC.

By March 2014, all IRs (with the exception of the IRs on spatial data services) have been adopted as Commission Decisions or Regulations, and are binding in their entirety. In addition to the elements above, Article 15 of the INSPIRE Directive stipulates that "The Commission shall establish and operate an INSPIRE geoportal at Community level" and

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[1] Commission Regulation (EC) No 1205/2008 of 3 December 2008 implementing Directive 2007/2/EC of the European Parliament and of the Council as regards metadata, OJ L 326, 04/12/2008, p. 12–30

[2] Commission Regulation (EC) No 976/2009 of 19 October 2009 implementing Directive 2007/2/EC of the European Parliament and of the Council as regards the Network Services, OJ L 274, 20/10/2009, p. 9–18

[3] Commission Regulation (EU) No 1089/2010 of 23 November 2010 implementing Directive 2007/2/EC of the European Parliament and of the Council as regards interoperability of spatial data sets and services, OJ L 323, 08/12/2010, p. 11–102

[4] Commission Regulation (EU) No 268/2010 of 29 March 2010 implementing Directive 2007/2/EC of the European Parliament and of the Council as regards the access to spatial data sets and services of the Member States by Community institutions and bodies under harmonised conditions, OJ L 83, 30/03/2010, p. 8–9

[5] Commission Decision of 5 June 2009 implementing Directive 2007/2/EC of the European Parliament and of the Council as regards monitoring and reporting (notified under document number C(2009) 4199) (Text with EEA relevance) (2009/442/EC)

that "Member States shall provide access to the services referred to in Article 11(1) *(i.e. the INSPIRE Network Services)* through the INSPIRE geo-portal …". Section 4.3.4 reports on outcome of the public consultation with respect to the EU geoportal.

2.2 *Timeline of Implementation*

The INSPIRE Directive envisages the implementation of the national infrastructures to be progressive and assigns different levels of priority to the INSPRIE spatial data themes. This is reflected in grouping the themes in the 3 Annexes of the Directive and allowing different implementation timelines for the different annexes:

- **Metadata**: 2 years after IR adoption for Annexes I and II (3/12/2010) and 5 years after IR adoption for Annex III (3/12/2013)

- **Network services**: 2 years after adoption of the relevant IRs (9/11/2011 for discovery and view services and 28/12/2012 for download and transformation services), but only for those spatial data sets and services for which metadata have been created in accordance with the Directive (this delays the implementation deadline for network services for Annex III data sets to 3/12/2013)

- **Interoperability of spatial data sets and services**: 2 years after adoption of the relevant IRs for newly created or extensively restructured data sets[6] (23/11/2012 for Annex I and 21/10/2015 for Annex II+III data sets), and 7 years after adoption of the relevant IRs for all other data sets (23/11/2017 and 21/10/2020).

- **Data and service sharing with Community Institutions and Bodies**: 18 months after entry into force (19/10/2011) with a transition period of up to 3 years for arrangements already in place at the time of entry into force of the IR.

- **Monitoring and reporting**: After the its date of adoption (5/6/2009), in practice since the first report afterwards (15/05/2010)

In addition, the legal obligations from the INSPIRE Directive (including obligations on data sharing among public authorities in Art. 17) apply since the 15 May 2009, the deadline for Member States to transpose the Directive into national law. This leads to a complex implementation roadmap, part of which is depicted in Figure 1 (the full roadmap is available at http://inspire.ec.europa.eu/index.cfm/pageid/44).

In summary, at the time of the public consultation, the Member States are expected to have already:

1. Transposed the INSPIRE Directive into their national legislation and established appropriate structures and mechanisms for coordinating, across the different levels of government, the contributions of all those with an interest in their infrastructures for spatial information.

2. Established measures for the 'sharing' (gaining access, exchange and use) of the spatial data and services between its public authorities, with equal arrangements open to the public authorities of other Member States.

3. Established measures for sharing with Community Institutions and Bodies, unless a transition period was requested.

4. Documented all the datasets and services that fall under the 34 themes of INSPIRE with harmonised metadata.

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[6] All spatial data sets that have been collected or extensively restructured after the entry into force of the INSPIRE Directive on 15 May 2007.

5. Provided easy to use discovery, view, download, and transformation services (where needed)

6. Provided newly collected or restructured data under Annex I according to the harmonised INSPIRE specification.

It is important to note that many of the implementation deadlines have only recently passed (e.g. download services for Annex I+II data sets in late 2012, metadata and all network services for Annex III in late 2013) and are yet to come (data interoperability for all data sets except newly collected / extensively restructured Annex I data sets). This means that much of the implementation of INSPIRE is only just starting in many organisations, which is an important factor to be considered in reading the results of the public consultation.
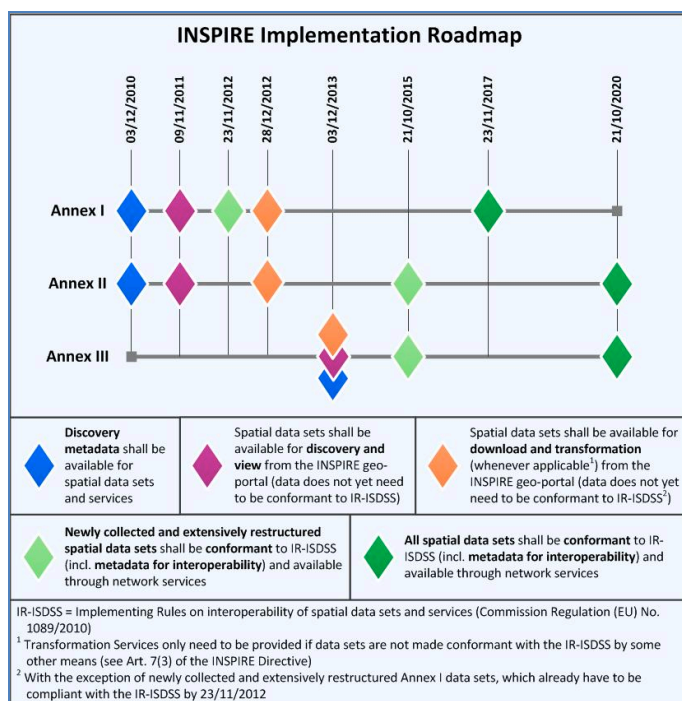
Figure 1 – Overview of the INSPIRE implementation roadmap for metadata, network services and interoperability of spatial data sets and services

3 The Questionnaire

The questionnaire designed for the public consultation (see Appendix) sought to get the opinion of respondents on their experiences as producers or users of spatial data related to INSPIRE with a series of closed questions against which the respondents could express their views on a 5-point scale (agree strongly, agree, no opinion, disagree, disagree strongly). Three open-ended questions were also provided to allow views on the key challenges encountered in implementing/using INSPIRE, key benefits, and key suggestions for changes for the future.

The questionnaire was published on the European Commission web site for public consultations "Your Voice"[7] and promoted through the INSPIRE website, INSPIRE Forum, and with direct mails to the INSPIRE national contact points, mailing lists of experts and participants to the INSPIRE conferences.

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[7] http://ec.europa.eu/yourvoice/index_en.htm

There were 698 completed replies by the end of the consultation from more than 30 countries (27 within the EU, 3 in the European Economic Area, 4 other European countries, and 2 from US/Canada). Thirty percent of replies came from only two countries (Germany and Spain) with over 100 replies each. 14 countries provided between 10 and 40 replies, and 13 countries provided fewer than 10. This skewed distribution does not allow a country-by-country analysis of the results. It should also be noted that some countries had a process of internal consultation leading to a few consolidated replies reflecting a wider body of opinion than the simple number of replies would suggest.

Most respondents came from the public sector (68%) as shown in Figure 2 but it is noticeable that 13% also came from private citizens, which is a very positive result. Table 1 provides the absolute number of respondents by type (Numbers are rounded to nearest whole number so percentages do not add to 100.)

Public sector organisation		473	68%
Private sector organisation		81	12%
Academic sector organisation		29	4%
Private citizen		88	13%
An INSPIRE National Co-ordination organisation		27	4%

Table 1: INSPIRE Public Consultation 2014: Number of Respondents by Type. Note that respondents can belong to more than one type.

The following sections report the key results of the public consultation following the structure of the questionnaire.
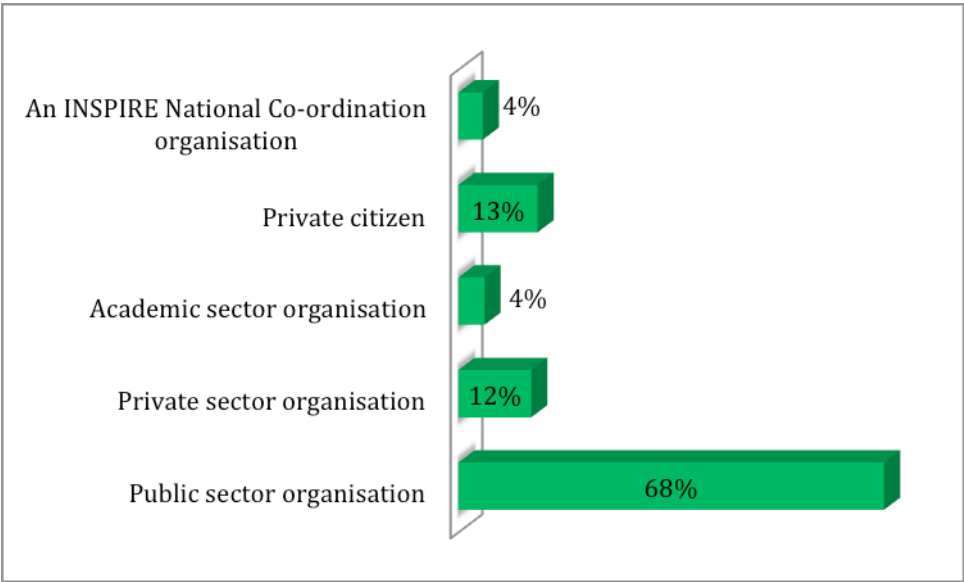
Figure 2: INSPIRE Public Consultation 2014: Respondents by Type

4   Findings

4.1   *Scale or Operations of the Respondents by Type*

The initial section of the questionnaire sought to identify whether the respondents operated mainly at local, regional, national, or international level. Respondents in each category (public sector, private sector, academic, citizen, or INSPIRE National Contact Point-NCP)

could choose more than one level of operations, so Figure 3 gives total numbers and not percentages. The question was formulated as follows (for each category): *Are you or your organisation using and/or producing spatial data and/or services for projects at the….*

Public sector organisations are more evenly distributed across the local-to-national levels, with less international involvement, while private and academic sector span all scales. Interesting to note is that also those who responded in their private citizen capacity use data at all scales, with a predominance of the national level. NCPs (not shown below) are mainly operating at national level.
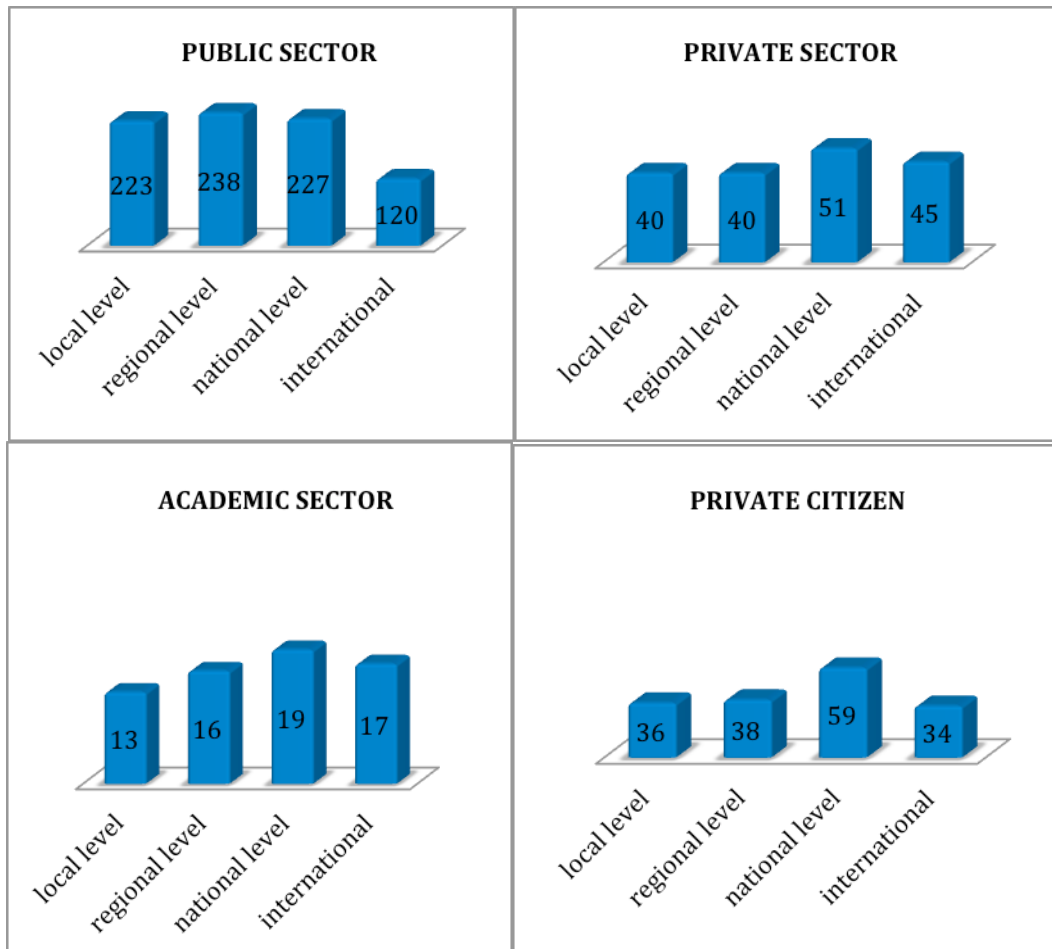
Figure 3: INSPIRE Public Consultation 2014: Respondents by Scale of Activity

4.2 *Level of Involvement in INSPIRE*

This section of the questionnaire included three questions on the extent to which the respondents had been involved in projects implementing INSPIRE measures at different scales (local, regional, national or international scale), whether they had contributed to the development of the Implementing Rules, and if so, to which one.
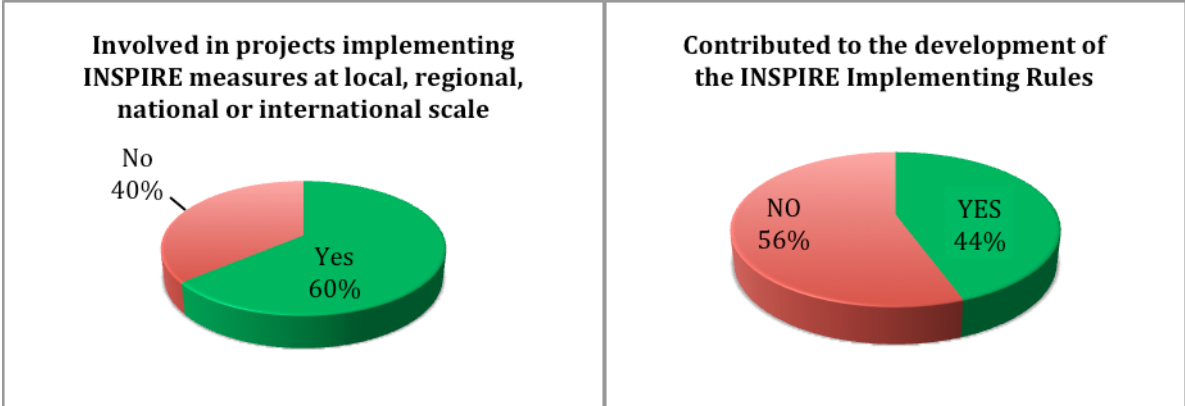
Figure 4: INSPIRE Public Consultation 2014: Involvement of Respondents in INSPIRE
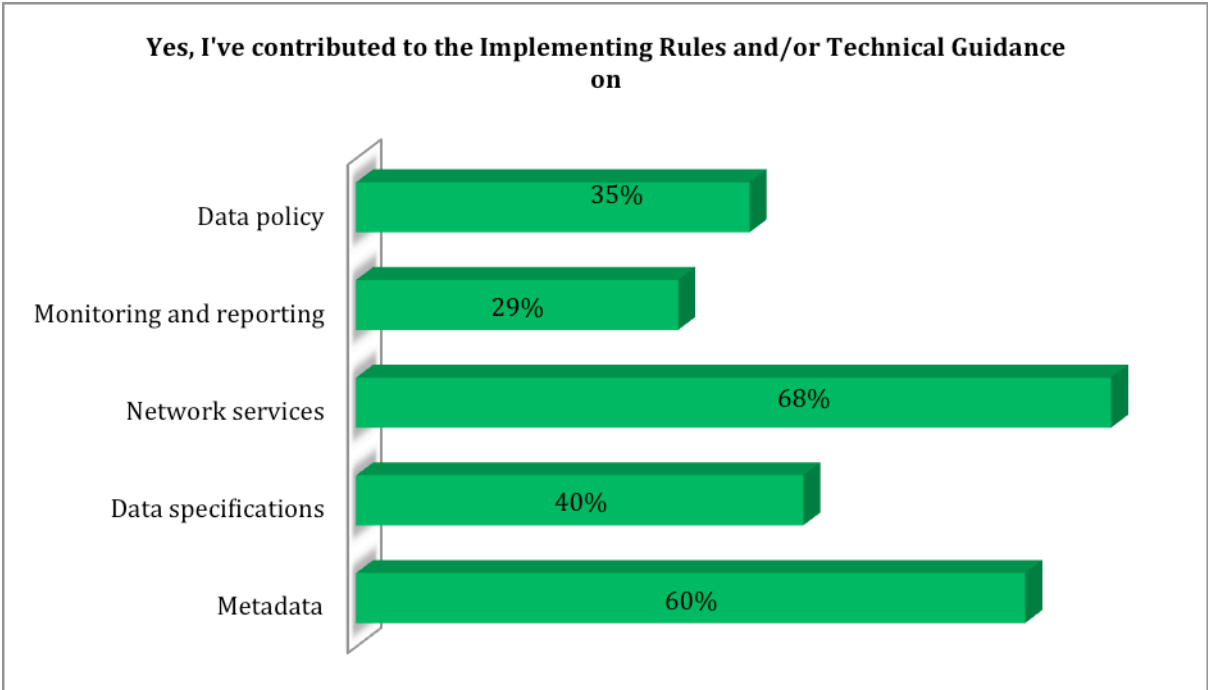
Figure 5: INSPIRE Public Consultation 2014: Contribution of Respondents to INSPIRE IRs.

As Figure 4 shows 40% of respondents to the INSPIRE Public consultations had not been involved with implementing INSPIRE measures. They obviously knew about INSPIRE enough to want to complete the questionnaire, but had not direct involvement so far in implementing any of its measures. On the other hand, 60% had been involved, and among those, 44% had actively contributed to the development of the IRs.

We can identify therefore three tiers of respondents: an outer layer of 40% who have not been involved in the development or implementation of INSPIRE measures, a middle layer of just over one third (56% of 60%) that have been involved in the implementation of INSPIRE but not in the development of the technical specifications, and the inner core of another one third of respondents who were directly involved in implementing INSPIRE as well as the development of the IRs.

4.3 *User Experience*

4.3.1 Annex I

The vast majority of respondents (88%) are users of data in one of the three Annexes of the Directive. For Annex I, the most popular data theme used at Administrative Units (68%) as shown in Figure 6, but all others drew between 40-60% of responses, with the exception of geographical grids, which are not a data sets as such but a framework of reference.
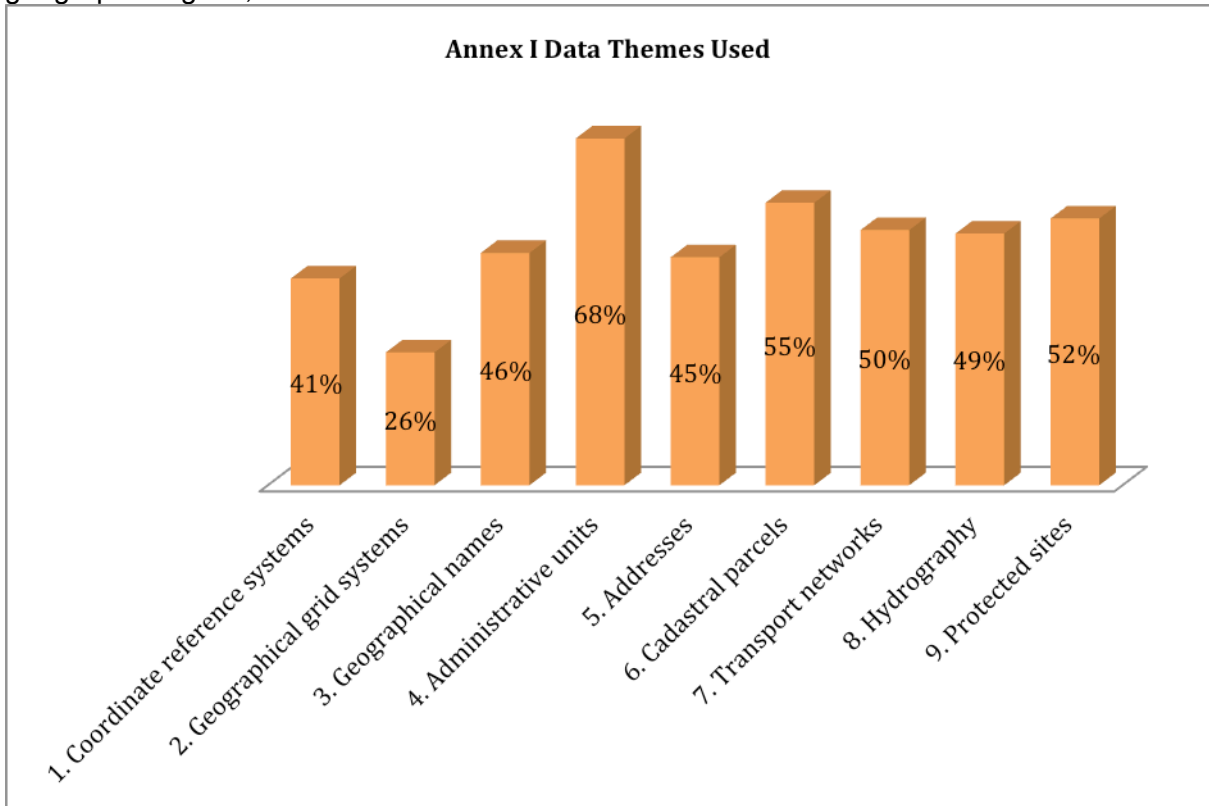

Figure 6: INSPIRE Public Consultation 2014: Use of Annex I Themes.

For each of the data themes, the questionnaire asked a number of questions related to extent to which, in the experience of the users, the data comes from public authorities, is documented, can be discovered, viewed, and downloaded, and whether data policy is perceived as an obstacle to access and use. Figure 7 reports the average values for all Annex I themes as there are no major variations across the themes: For data documentation the best are Administrative Units (74%) and worst Transport Networks (58%). For discovery services, best are Geographical Grids (74%) and worst Transport Networks (59%), for view services the best are Administrative Units (80%) and the worst Coordinate Reference Systems (58%). Slightly higher variations are present among download services, as shown in Figure 8, which are also less widely available than discovery and view.

To note that only about two thirds of the data in Annex I are documented with metadata and are discoverable through web services. Using the metaphor of the glass that can be seen as half full or half empty, we can interpret this data in two ways. Two thirds of the data themes in Annex I are documented and discoverable. Therefore, INSPIRE is clearly starting to work and address the lack of documentation and discoverability of spatial data which were two of the key barriers identified at the outset of INSPIRE. On the other hand, one

third of the data themes are still not documented and made discoverable, indicating delays in INSPIRE implementation for these measures, which should already be in place.
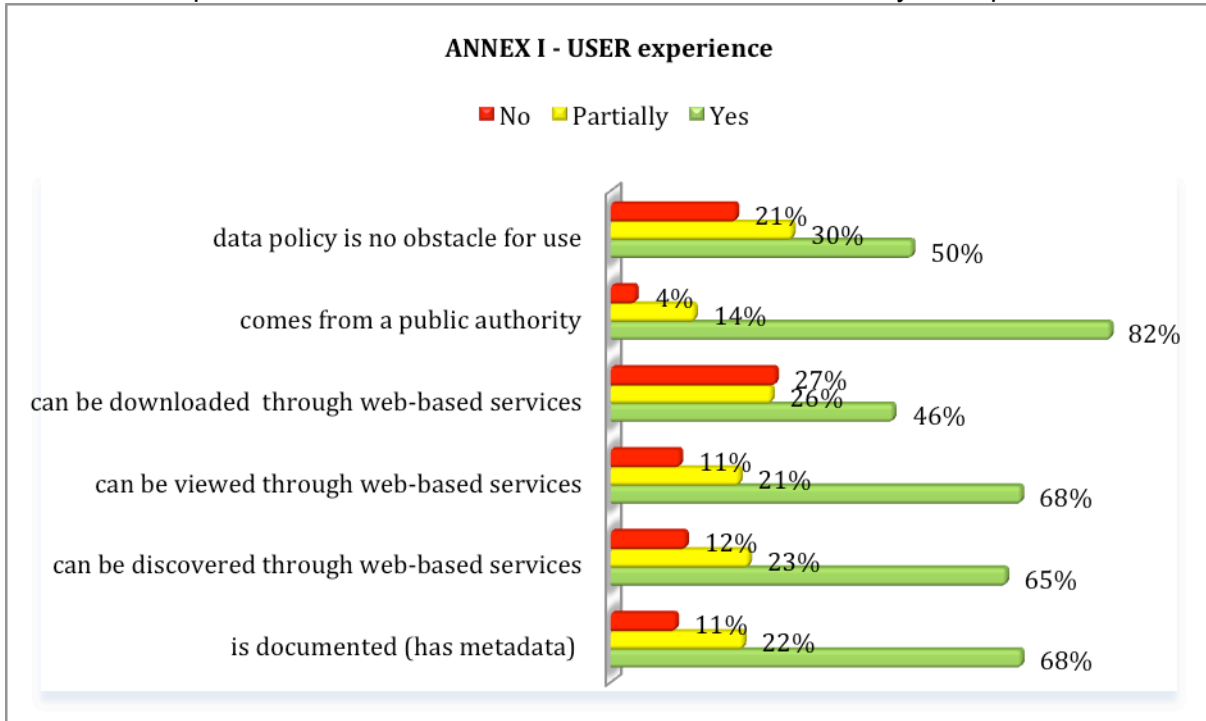

ANNEX I - USER experience

■ No ■ Partially ■ Yes

- data policy is no obstacle for use — 21% / 30% / 50%
- comes from a public authority — 4% / 14% / 82%
- can be downloaded through web-based services — 27% / 26% / 46%
- can be viewed through web-based services — 11% / 21% / 68%
- can be discovered through web-based services — 12% / 23% / 65%
- is documented (has metadata) — 11% / 22% / 68%

Figure 7: INSPIRE Public Consultation 2014: User Perspectives on Annex I Themes.

ANNEX I- USER EXPERIENCE[can be downloaded through web-based services]

■ YES ■ PARTIALLY ■ NO

Theme	YES	PARTIALLY	NO
Coordinate reference	42%	34%	24%
Geographical grid	46%	30%	25%
Geographical names	50%	25%	25%
Administrative units	56%	21%	23%
Addresses	43%	24%	32%
Cadastral parcels	45%	20%	35%
Transport networks	38%	28%	34%
Hydrography	47%	28%	25%
Protected sites	51%	28%	21%
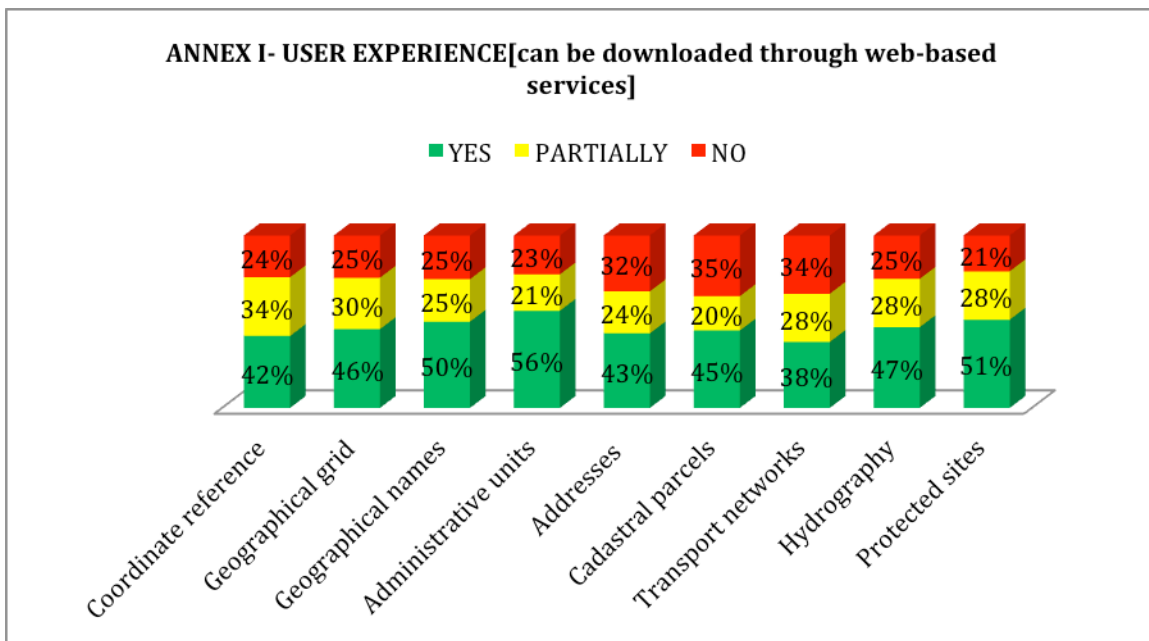
Figure 8: INSPIRE Public Consultation 2014: User Perspectives on Download Annex I Themes.

Figure 9 focuses on the data policy issue to analyse whether indeed there are significant variations across themes. The most "open" theme is protected areas, while the theme that is more controlled by data producers is cadastral parcels. As the Figure shows the variations are not very strong, it must me remarked though that overall 40-50% of users still

experience data policy obstacles in accessing and using INSPIRE data themes in Annex I even though measures to remove such obstacles at the point of use should have been put in place by the Member States since 2009.
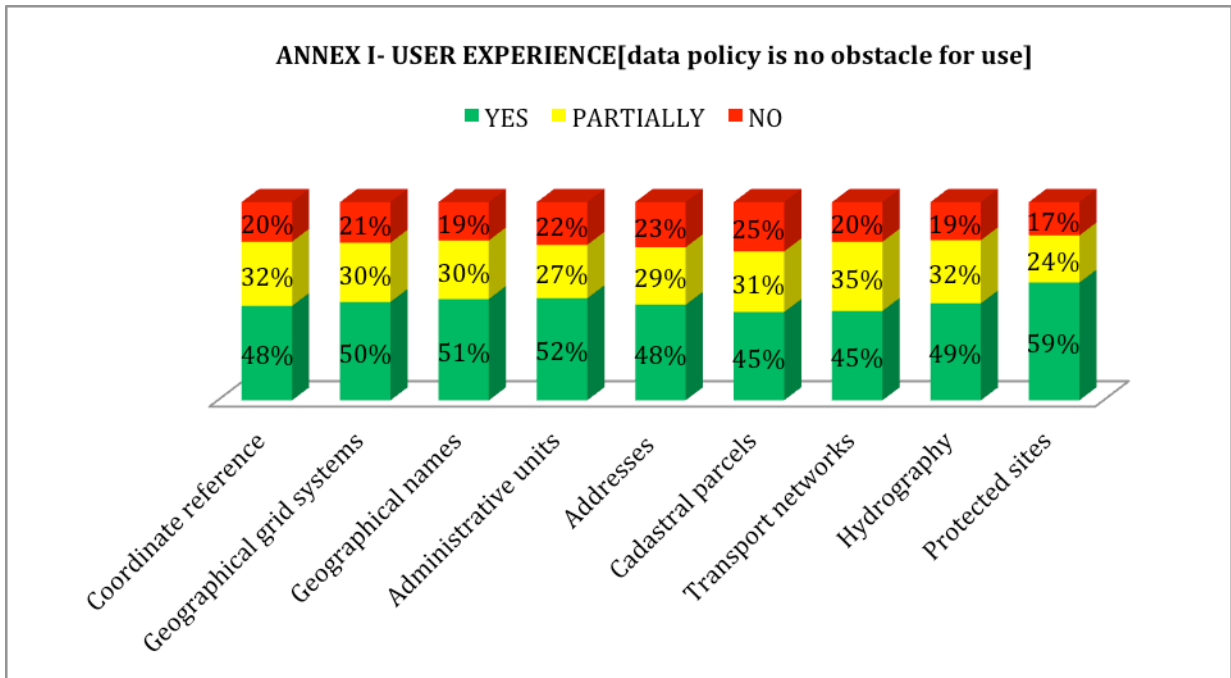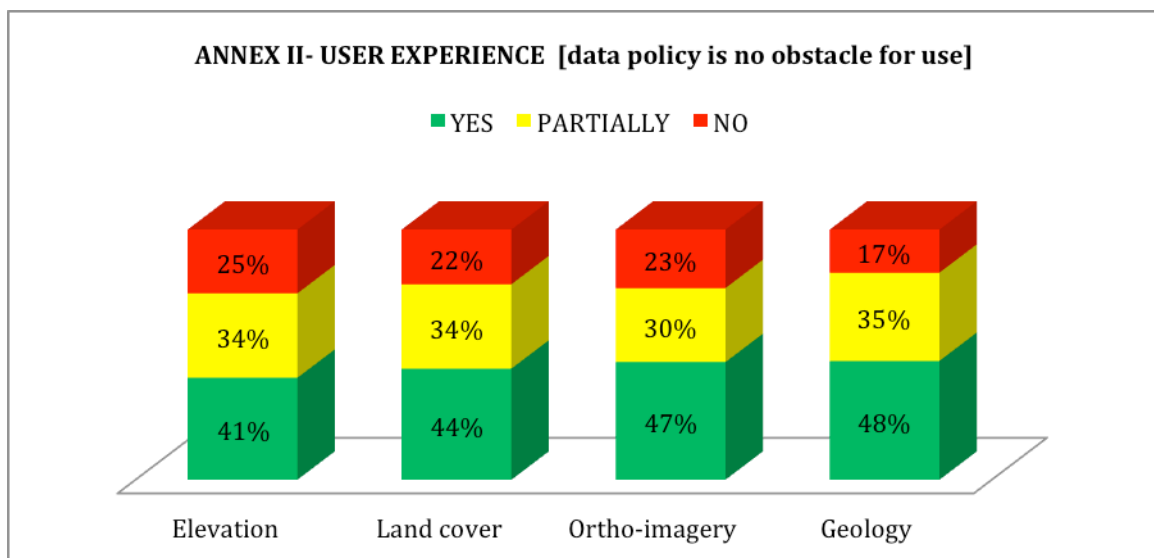

Figure 9: INSPIRE Public Consultation 2014: User views on Data Policy Obstacles Annex I.

4.3.2 Annex II

Among Annex II themes, the most used are ortho-images, and the least are geological data (Figure 10).
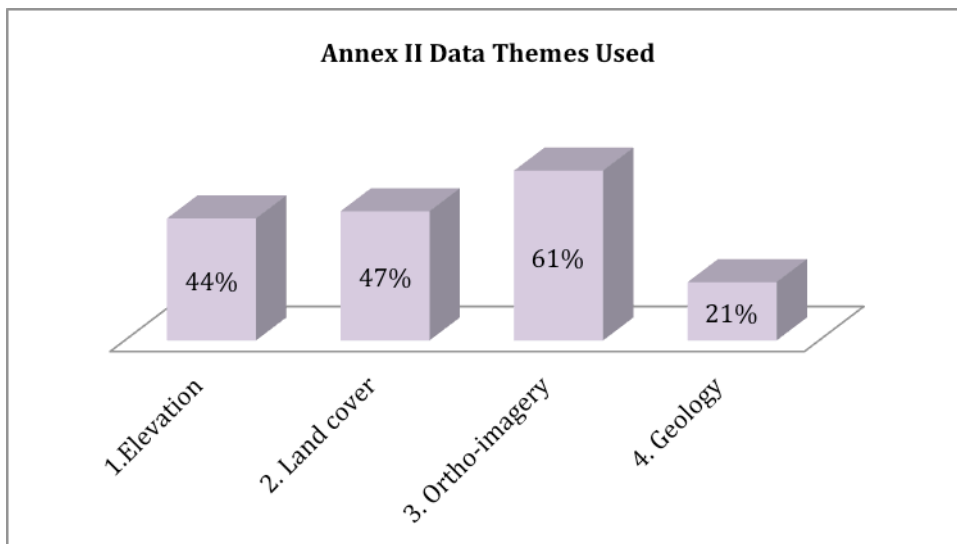
Figure 10: INSPIRE Public Consultation 2014: Use of Annex II Themes.

As in Annex I, only about two thirds of the data is documented and is discoverable thorough web services, showing therefore positive development on the one hand, and delay in implementing the provisions of the Directive on the other. Ortho-images are also the more widely documented (74%), and served via discovery (75%), and view services (82%). By

reference, Elevation is the theme that does least well with respect to documentation (62%), discovery (58%) and view services (57%). Download services are less well developed across all themes, and range between 38% for Elevation to 43% for Ortho-images and Geology.
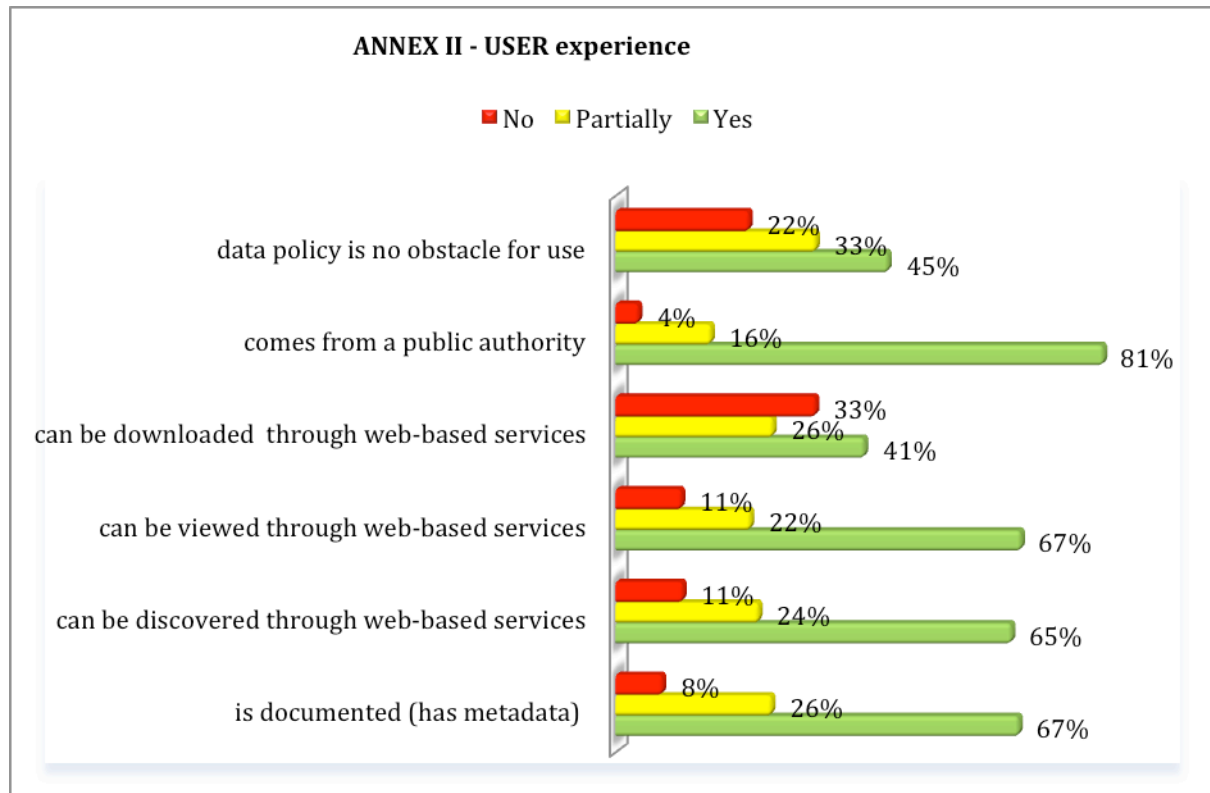
Figure 11: INSPIRE Public Consultation 2014: User Perspectives on Annex II Themes.

With respect to data policy, Figure 12 shows than less than half of the respondent agree that data policy is not an obstacle to data access and use, while for the other half it is still an obstacle to varying degrees.

Figure 12: INSPIRE Public Consultation 2014: : User views on Data Policy Obstacles Annex II.

4.3.3 Annex III

Among Annex III data themes, the most widely used is Land Use (45%), followed by Buildings (37%) and Statistical Units (27%). The remaining data themes drew responses in the range of 6-23%. It is important here to remember that the deadline for the Member States to complete their metadata and put in place discovery services for these themes was December 2013, so just before the public consultation was launched. Given that there are still significant delays for Annexes I and II, which should have been completed in 2010, it is no surprise that for Annex III the delays are even greater.

ANNEX III- USER EXPERIENCE - average values

■ No ■ Partially ■ Yes

	No	Partially	Yes
data policy is no obstacle for use	19%	40%	41%
comes from a public authority	6%	25%	68%
can be downloaded through web-based services	32%	38%	30%
can be viewed through web-based services	19%	36%	46%
can be discovered through web-based services	19%	34%	47%
is documented (has metadata)	15%	36%	49%
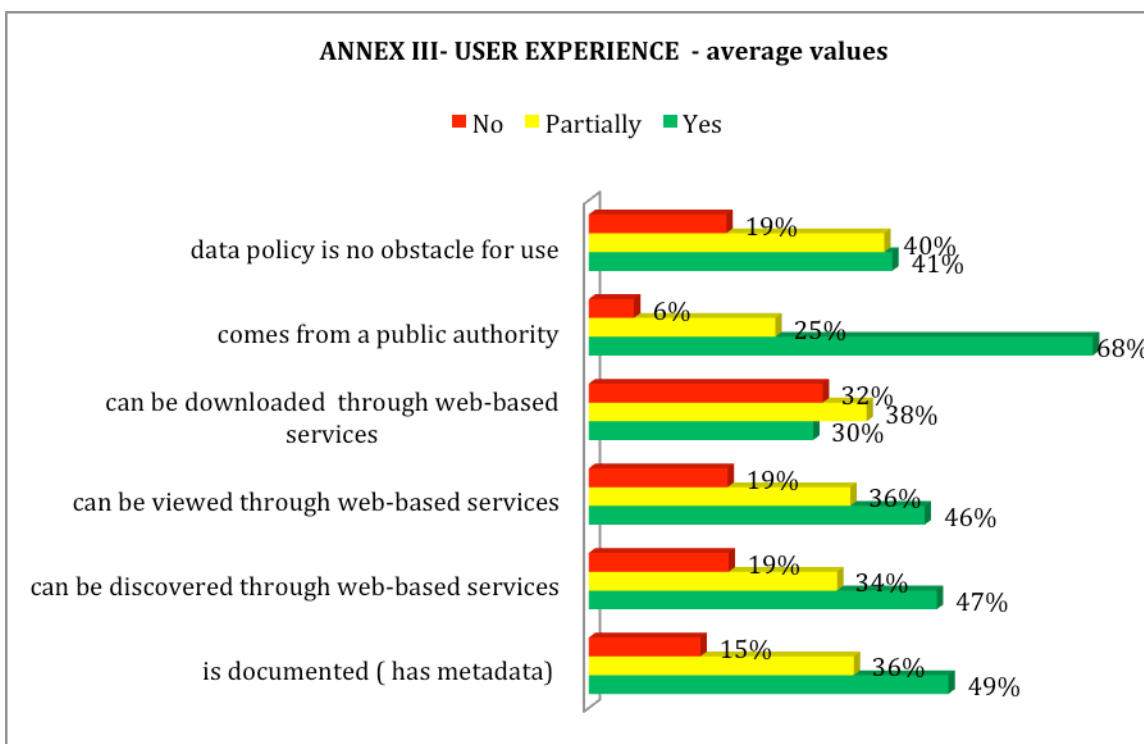
Figure 13: INSPIRE Public Consultation 2014: User Perspectives on Annex II Themes.

Figure 14 focuses on data policy as an obstacle for data access and use. As shown, most themes hover around the mean values shown in Figure 13. Only about 40% of data themes appear not to have obstacles for data access and use. The best themes are Bio-geographical regions and Habitats, while Agriculture and Aquaculture facilities are the ones with a higher degree of obstacle to access and use. As indicated for other Annexes, the level of implementation in the Member States of the measures necessary to remove these obstacles at the point of use, is a matter of concern, which will be reflected in the INSPIRE mid-term evaluation.
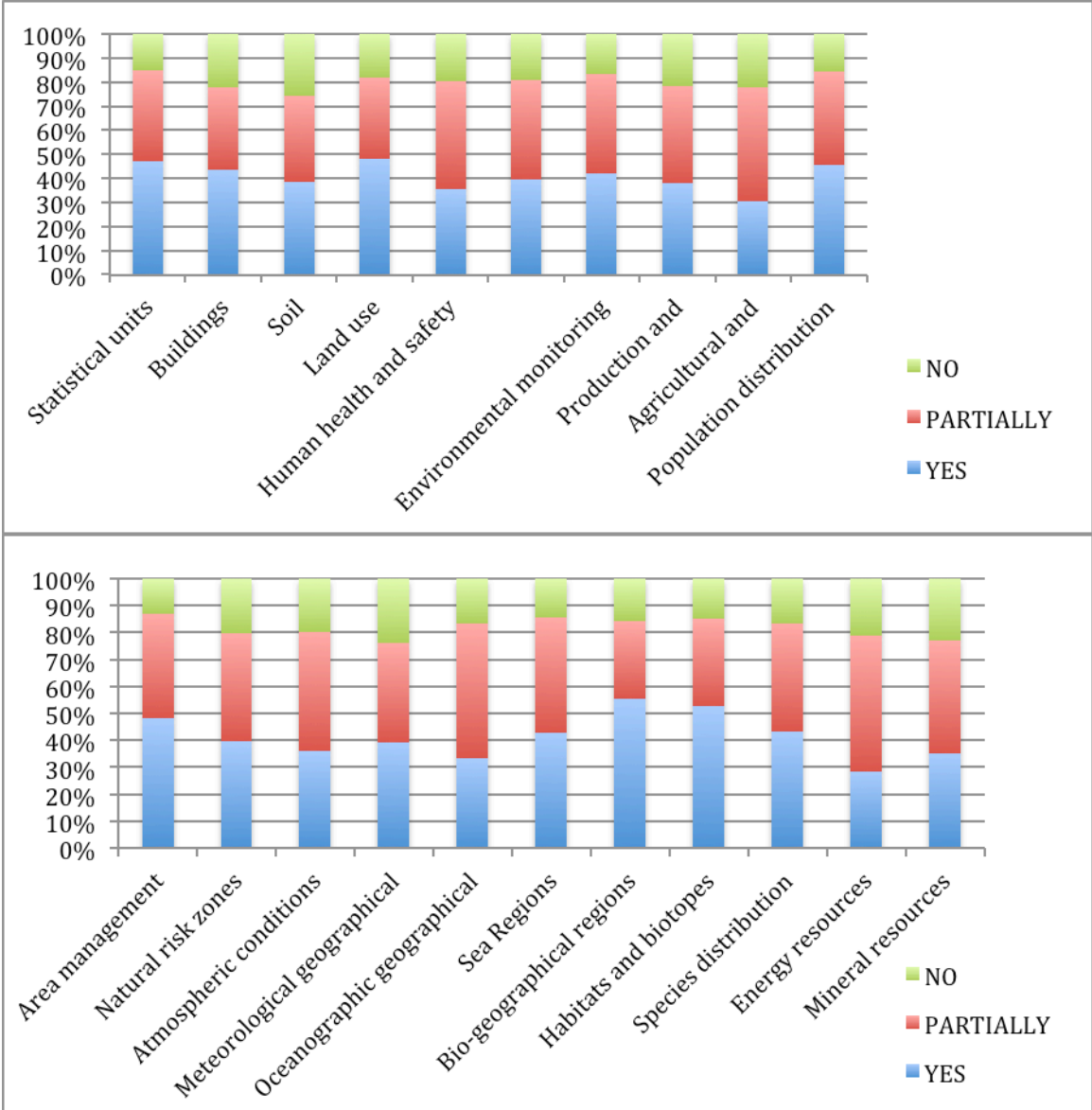
Figure 14: INSPIRE Public Consultation 2014: User views on Data Policy Obstacles Annex III.

4.3.4 INSPIRE Geoportal

As indicated in Section 2.1, the INSPIRE Directive asks the Commission to establish and operate an INSPIRE geoportal at Community level to which Member States must link their network services. The Member States can also provide access to those services through their own geoportals.

The INSPIRE geoportal operates an on-line register where Member States can register the service endpoints of their national or regional INSPIRE discovery services. The INSPIRE geoportal then regularly harvests the metadata from these registered discovery services and uses the information present in the service metadata to dynamically discover the other INSPIRE network services (view, download, transformation and invoke). Clearly therefore, the INSPIRE geoportal mirrors the content of the national and regional geoporals, which in addition, often also provide more than just INSPIRE metadata and datasets.

Since November 2010 the Commission operates a pilot version of the INSPIRE geoportal while in parallel pursuing the development of the operational version developed by an industrial consortium. This operational version is scheduled to replace the pilot version in 2015. As of March 2014, 22 Member States had registered their national or regional INSPIRE discovery services to the INSPIRE geoportal, while 6 had not yet done so.

The public consultation indicates that relatively few respondents (31%) used the INSPIRE geoportal, whilst national and regional geoportals were much more popular (77%). This is to be expected as most users look primarily for data about their own country. As more harmonised datasets will become available through the implementation of INSPIRE supporting cross-border applications it is likely that the use of the INSPIRE geoportal will also increase. It must also be acknowledged that in the consultation the "other" geoportals cover a wide range of applications, including national and regional geoportals, community specific geoportals and even very generic geoportals (Google, Bing, Yahoo map services etc.).

The question concerning what type of services are being used and are accessible through the INSPIRE geoportal shows a picture that is largely in line with the INSPIRE roadmap, with a larger positive result for the use and accessibility of discovery and view services than for the download services (see Figure 15). As the legal obligation for making download services operational occurred at a later stage in the roadmap, this is to be expected. A relatively important part of the responses (+/- 25%) indicate that the spatial data needed can neither be found nor visualised through the INSPIRE geoportal.
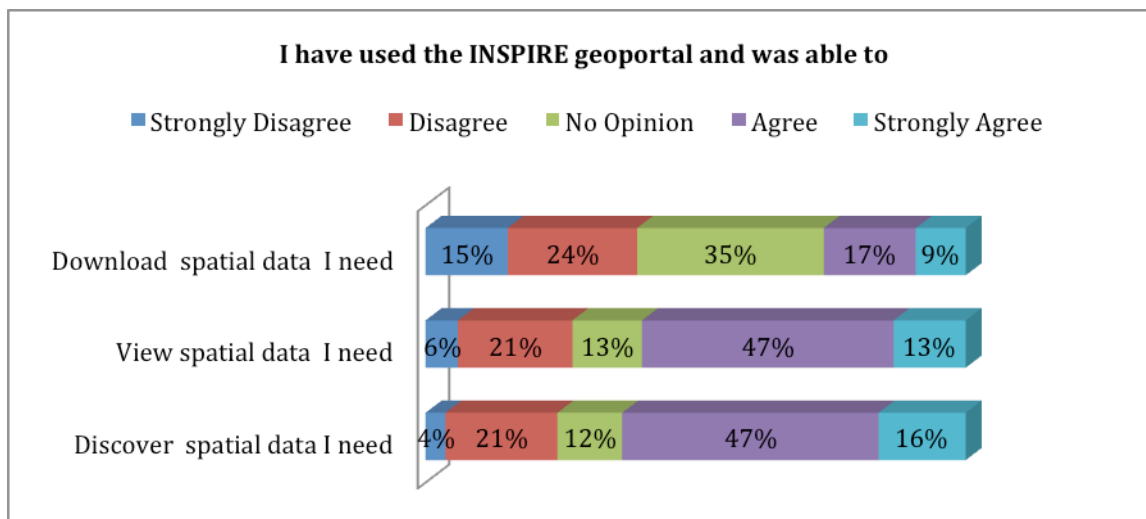
Figure 15: INSPIRE Public Consultation 2014: Feedback on the use of the INSPIRE geoportal.

Comparing the situation with the response to the similar question for other geoportals (Fig. 16), the overall picture that emerges looks quite similar. In this case, it is harder to attribute the negative response to the download availability of data sets to a later availability of these services and we must conclude that other obstacles are present that prevent the downloading of data. The general response on spatial data that can neither be discovered nor viewed is only slightly better as compared to the question of the EU geoportal, indicating that the issue is not really INSPIRE specific.
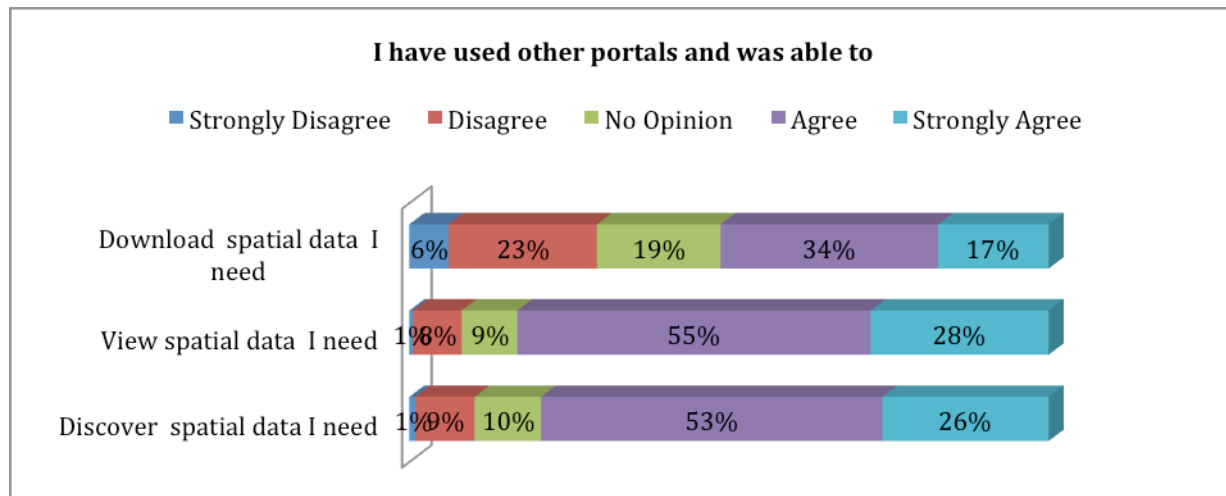
Figure 16: INSPIRE Public Consultation 2014: Feedback on the use of the other geoportals.

Considering the "Yes" percentages in the two questions relating to discoverability and accessibility of spatial data (Fig. 17), twice as many spatial datasets and services are reported to be accessible through national or regional geoportals as compared to their accessibility through the INSPIRE geoportal.
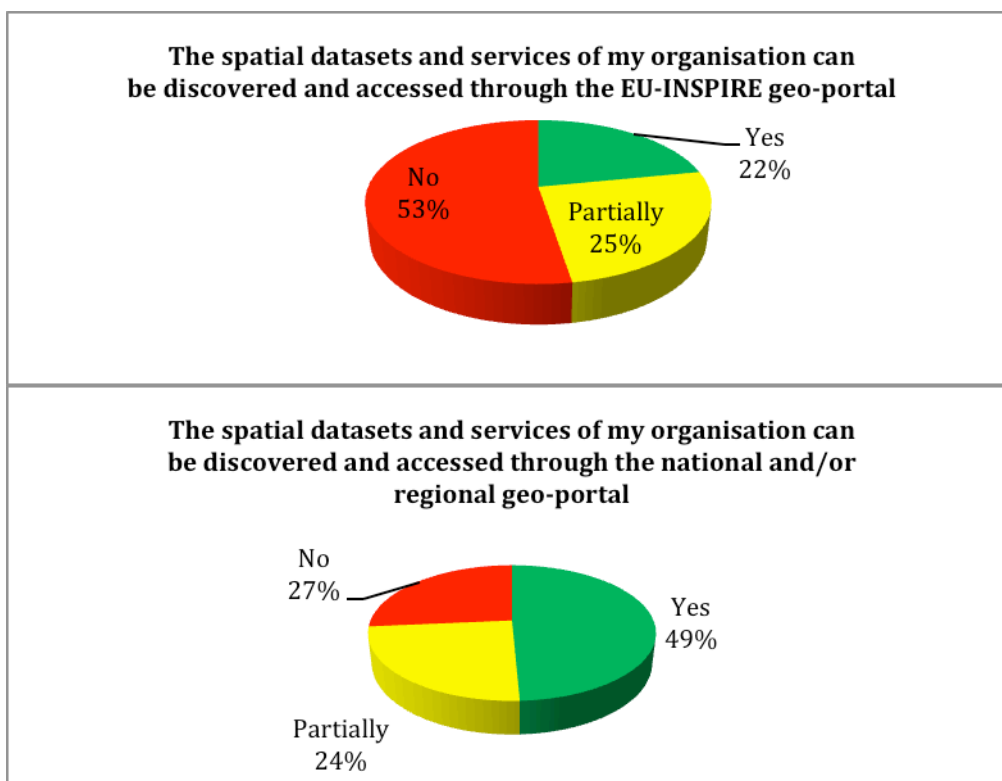

Figure 17: Discoverability and Accessibility of Spatial Datasets in National and EU Geoportal.

Under the assumption that all the spatial datasets and services available at the national level in Figure 17 fall under the remit of the INSPIRE directive, and that their INSPIRE metadata is fully harvested and discoverable through the INSPIRE geoportal, this would mean that there are missing links either between the national and the INSPIRE geoportal or in the metadata to the datasets and services. We know that the former is the case in at least 6 countries that have not linked their national geoportals to the one operated by the Commission. Another issue of concern is that even at the national level, more than half of

the spatial datasets and services are not discoverable and accessible through a national or sub-national geoportal.

The INSPIRE geoportal should offer the advantage of easier cross-border searches and visualisations compared with regional or national geoportals. The feedback from the public consultation is almost evenly split on this point, which just over half of the respondents agreeing that the EU geoportal makes it easier to find data in cross-border areas. The implementation of the Implementing Rules on the interoperability of spatial datasets could be a driving factor to improve this situation, as it should allow an easier combination of datasets originating from different countries.

4.4 *Data Producer Experience*

This section of the questionnaire sought to gather the perspective on INSPIRE of organisations producing spatial data in both public and private sectors. Of the 698 respondents to the public consultation, 420 (60%) are data producers, of which the vast majority (369 or 87%) are public sector organisations, and the rest (13%) in the private sector. Figures 18, 19 and 20 show the distribution of themes produced by the respondents to the public consultation. As shown, all themes are covered well, which is important to then give strength to the other answers provided in this section.
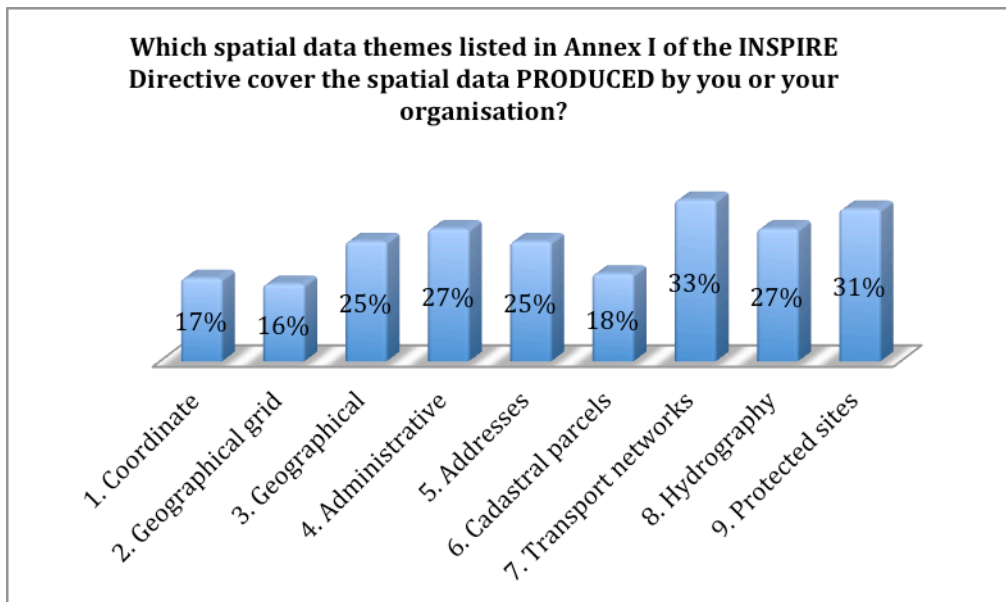
Figure 18: Annex I Data Produced by Respondents to INSPIRE Public Consultation 2014
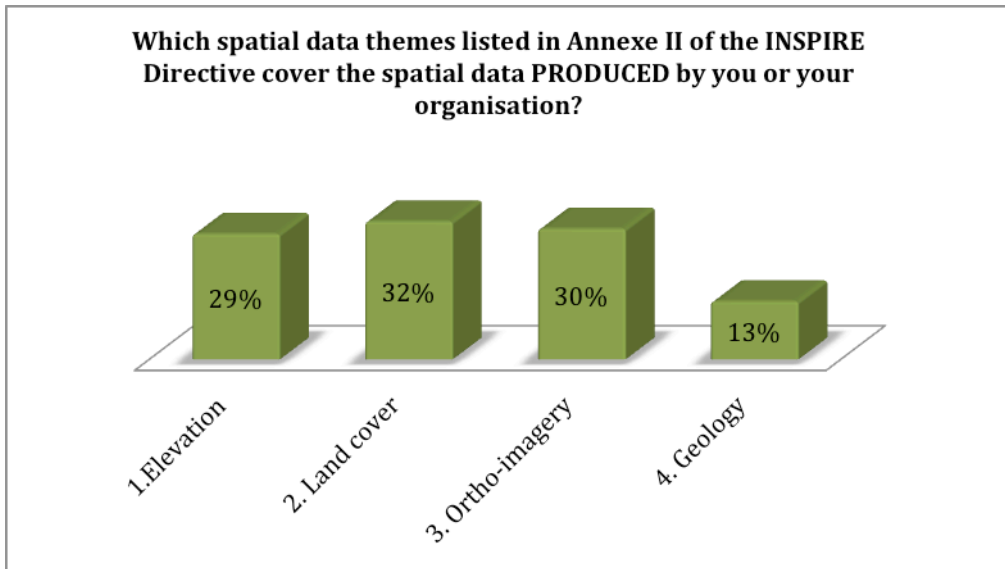
Figure 19: Annex II Data Produced by Respondents to INSPIRE Public Consultation 2014
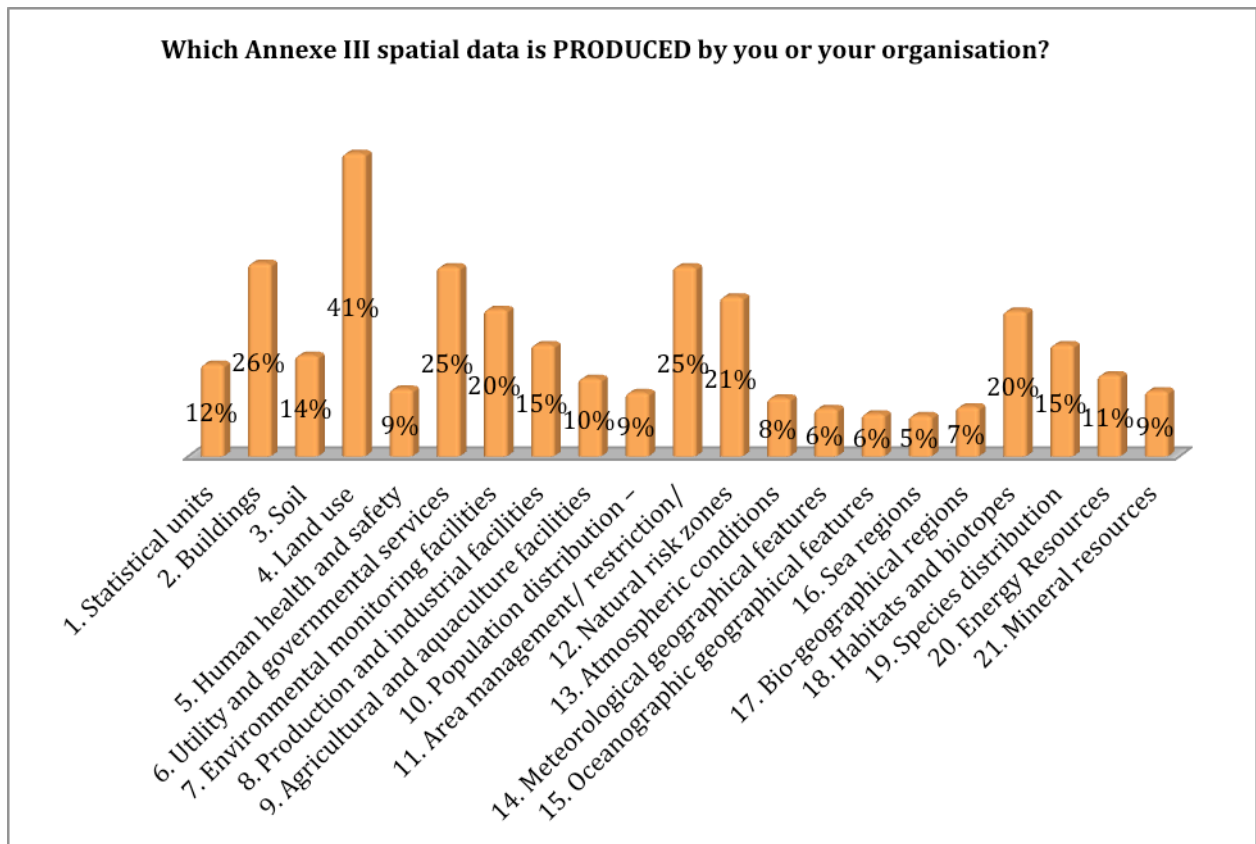
Figure 20: Annex III Data Produced by Respondents to INSPIRE Public Consultation 2014

4.5 *Metadata*

Figure 21 shows the extent to which the data (in any INSPIRE annex) produced by the organisation of the respondents to the public consultation are documented with metadata, and the extent to which such metadata is INSPIRE compliant. As shown, some 9% of spatial data has no metadata, and about one third has only some metadata. About 60% of

the data is documented, but the boundary between *Documented* and *Partially documented* my vary depending on the respondents. As could be expected, the percentage of data documented with INSPIRE compliant metadata is somewhat lower, while the percentage of partially documented increases to 40%.
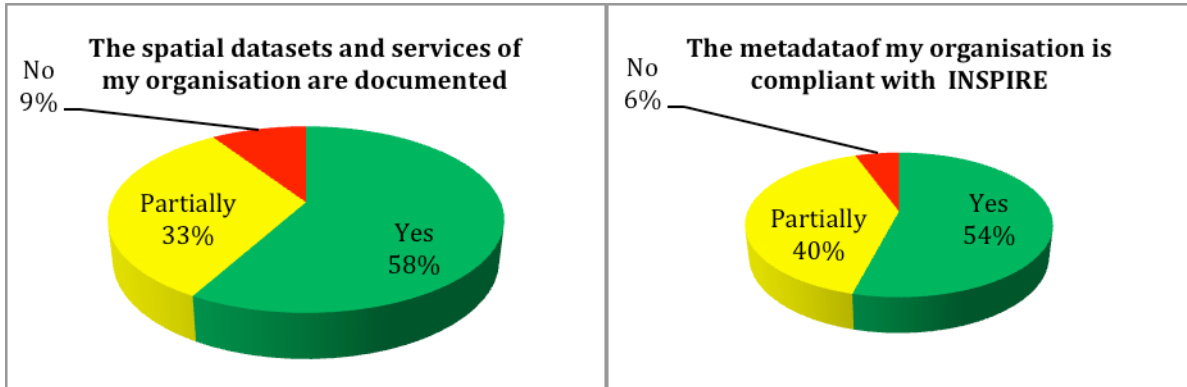
Figure 21: Annex III Data Produced by Respondents to INSPIRE Public Consultation 2014

It should be noted that about one third of the participants were unable to respond to either of these questions. Nevertheless, the responses given are consistent with the experience of the users reported in Section 4.3 pointing to progress, but also major delays in implementing the Directive.

4.6 *Network Services*

Figure 22 reports the views of the data producers on the extent to which their spatial datasets are delivered though discovery, view and download services, and whether such services are INSPIRE compliant.
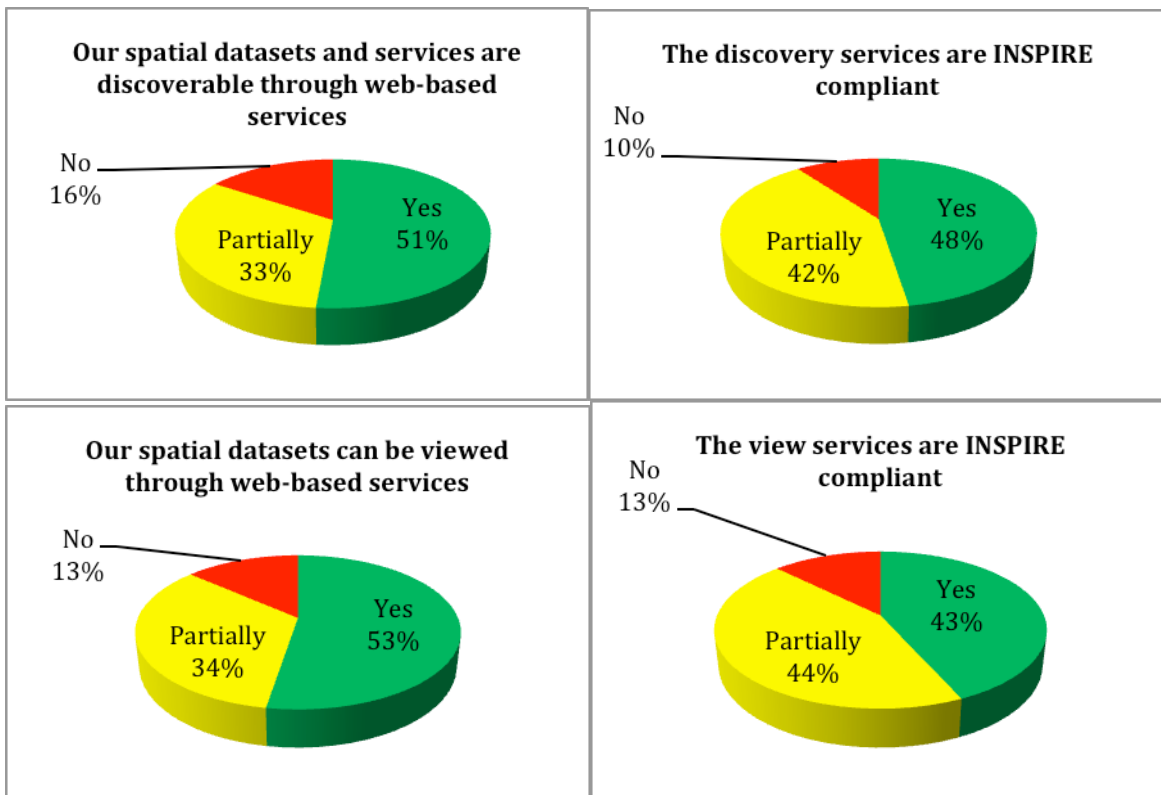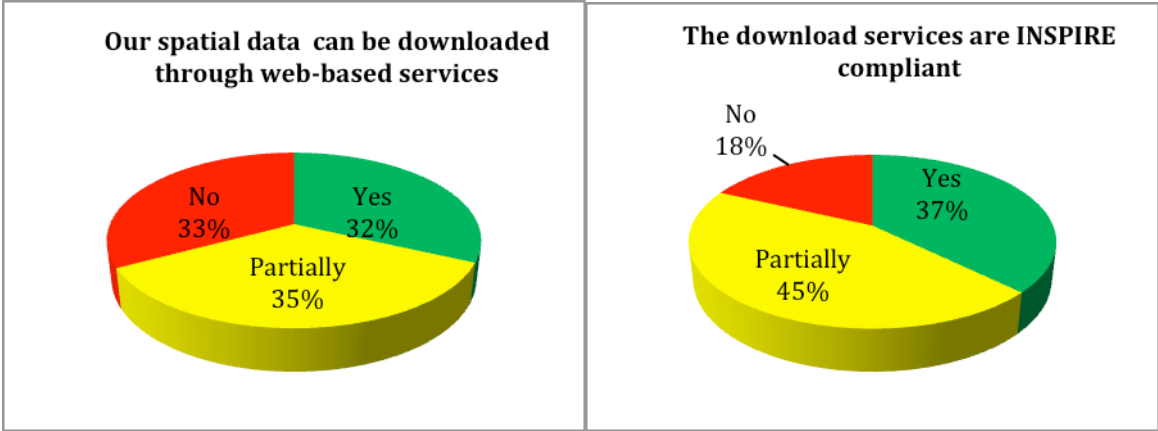
Figure 22: INSPIRE Public Consultation 2014: Data Producers' Perspective on Availability of Network Services to Serve the Data in their Organisation

As shown, only about half of the datasets are serviced through discovery and view services, and only about a third through download services. For discovery and view the percentage of services compliant with INSPIRE is lower than the overall availability. This is seemingly not the case for download services where the percentage of INSPIRE-compliant services (37%) appears slightly higher than overall availability (33%). This may however be an artifact of the high level of participants who did not know how to respond (40%).

On the whole, the views of the data producers on the practices of their organisation with respect to network services are consistent with the experience of the users and again show some progress made but also considerable delays in implementation.

4.7 Data Sharing

Respondents from data producing organisations indicated that only little more than half (53%) of their organisations had policies in place to support the data sharing requirements of INSPIRE (see Figure 23). This confirms the perceptions of the users reported in Section 4.2, and summarised across the three data themes in Table 2.
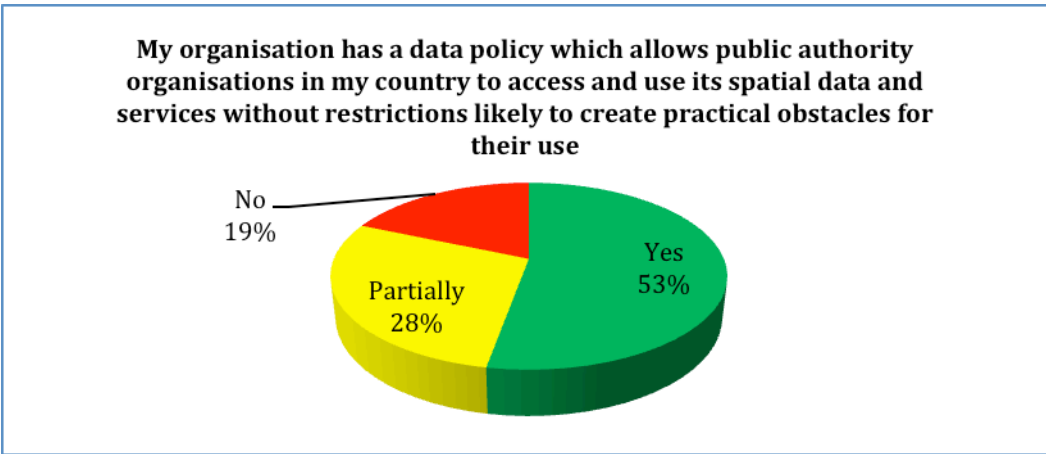
Figure 23: INSPIRE Public Consultation 2014: Data Producer Responses on Existence of Data Sharing Policy in their Organisation towards Other Public Administrations.

	Average		
	Obstacles exist	Obstacles exist partially	No obstacles
Annex I	21%	30%	50%
Annex II	22%	33%	45%
Annex III	19%	40%	41%
All annexes	20%	37%	44%

Table 2: User Responses to INSPIRE public consultation by perceived obstacles to data use

Two thirds of data providers indicated that their organisation did not discriminate against public administrations from other countries and applied the same conditions as done for public administrations in their own country. This is of course positive, but does not alleviate the fact that for about half all organisations had not put in place measures to remove obstacles at the point of view. Considering that five years have already elapsed since these sharing measures were supposed to be in place, this outcome is not satisfactory and may need remedial action.

4.8 *INSPIRE Coordination and Implementation*

The public consultation asked three questions on the perceived degree of coordination at European, trans-border and national level. The majority of respondents (50-60%) were not able to respond on the quality of coordination at EU and trans-border areas. More definitive views were instead expressed on the coordination at national level. Figure 24 show that there is some variation in the perception among national-level public sector organizations, local public sector ones, and the private sector on the extent to which the implementation of INSPIRE is well coordinated in their country. As shown the level of agreement and strong agreement to the question declines from 70% for public sector national organisations, to 44% for both local public sector, and private sector. This suggests that there is clearly room for improvement in engaging better both local level and private sector in INSPIRE implementation.
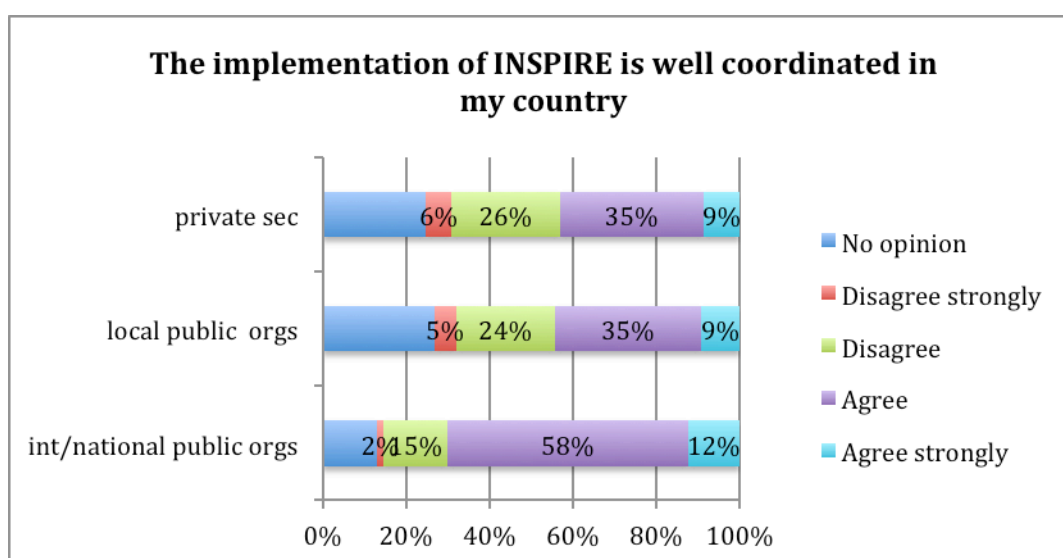
Figure 24: Responses to question on national coordination in 2014 INSPIRE public consultation by type of organisation.

4.9 *General Opinions on INSPIRE*

In the public consultation launched to support this mid-term evaluation of the Directive, several questions were asked to gauge the opinion of the respondents on the overall value and appropriateness of INSPIRE. The questions are reported in Table 3. As shown, most respondent feel positively about INSPIRE and its effects (Agree or Strongly Agree ranging from 45% to 92%) with no Opinion around 20%, and negative opinion between 2 and 24%. The most positive views are about the continued validity of the objectives of INSPIRE (92% in favour, 2% against), the least favourable are about the role of INSPIRE increasing efficiency or effectiveness of the respondent (49% in favour, 24% against). The areas of greatest uncertainty (No opinion) are not surprisingly those referring to the value of INSPIRE for cross-border applications (37% no opinion) and Benefits being greater than costs (38% no opinion). Even for those two questions, however, the positive replies outnumbered the negative (55% to 8% and 46% to 16% respectively).

	No opinion	Disagree strongly	Disagree	Agree	Agree strongly
The objectives of INSPIRE of making spatial data and services more easily shared and used are still pertinent	6%		2%	35%	57%
The actions foreseen by INSPIRE are still appropriate to meet its objectives	21%	1%	12%	47%	19%
INSPIRE has helped me/my organisation in becoming more efficient and effective	27%	6%	18%	35%	14%
INSPIRE has stimulated the use of the spatial data and services	17%	3%	9%	43%	29%
INSPIRE has improved the availability and accessibility of spatial data and services	12%	2%	7%	50%	29%
INSPIRE makes it easier to find and use spatial data and services in cross-border areas	37%	2%	6%	37%	18%
The benefits of INSPIRE will be greater than the costs	38%	5%	11%	27%	19%
INSPIRE improves access to the information needed for environmental policies and decisions	22%	2%	5%	48%	23%
INSPIRE also improves access to the information needed for other (non-environmental) policies and decisions	24%	2%	5%	49%	20%
INSPIRE contributes to a more open policy for public sector data	11%	1%	4%	51%	32%
INSPIRE contributes to more innovative applications and services using spatial data	18%	2%	6%	45%	28%
INSPIRE contributes to more general eGovernment activities	22%	2%	5%	48%	22%

Table 3: INSPIRE Public Consultation 2014: Perceived Impacts of INSPIRE

There are no differences of significance in the views of public or private sector organisations or even among those who responded on a private citizen capacity, as shown in more detail in Table 4. Private citizens are by and large generally less positive on the statements proposed but the differences are not very marked and the overall level of agreement with the objectives of INSPIRE is very high.

	Agree or Agree Strongly			Disagree or Disagree Strongly		
	Public Sector	Private Sector	Citizens	Public Sector	Private Sector	Citizens
The objectives of INSPIRE of making spatial data and services more easily shared and used are still pertinent	94%	89%	89%	1%	6%	6%
The actions foreseen by INSPIRE are still appropriate to meet its objectives	67%	63%	50%	11%	19%	23%
INSPIRE has helped me/my organisation in becoming more efficient and effective	52%	40%	42%	25%	28%	23%
INSPIRE has stimulated the use of the spatial data and services	71%	75%	65%	11%	10%	18%
INSPIRE has improved the availability and accessibility of spatial data and services	81%	77%	67%	6%	12%	16%
INSPIRE makes it easier to find and use spatial data and services in cross-border areas	54%	51%	53%	6%	14%	16%
The benefits of INSPIRE will be greater than the costs	43%	51%	53%	17%	12%	17%
INSPIRE improves access to the information needed for environmental policies and decisions	70%	75%	67%	6%	10%	10%
INSPIRE also improves access to the information needed for other (non-environmental) policies and decisions	69%	69%	65%	6%	7%	11%
INSPIRE contributes to a more open policy for public sector data	85%	81%	74%	5%	7%	9%
INSPIRE contributes to more innovative applications and services using spatial data	74%	77%	68%	7%	7%	16%
INSPIRE contributes to more general eGovernment activities	71%	64%	70%	6%	10%	11%

Table 4: INSPIRE Public Consultation 2014: Perceived Impacts of INSPIRE by Type

4.10 *Obstacles Faced, Changes Proposed, and Benefits Identified*

The public consultation included three open questions in which the respondents could write the three biggest obstacles/challenges encountered in INSPIRE (Table 5), the changes proposed to achieve the INSPIRE objectives (Table 6), and the three biggest benefits perceived by the respondents (Table 7). The tables split also the answers by data producers and users, although it should be noted that in several instances respondents fall into both categories, hence their sum is greater than the total number of responses.

The most frequently cited obstacles are about the technical complexity of the specifications; coordination issues with top-down approach involving only national authorities, and almost equal third issues of communication, awareness and capacity building, and issues of the wide scope of data harmonisation. It should be noted that fewer than 30% of replies indicate technical complexity as a problem (Table 5), whilst almost 20% indicated data interoperability/harmonisation as a main benefit of INSPIRE (Table 7). Therefore, even if

technical complexity is the most cited problem, it should be put into context both in respect to the total number of replies provided, and to the balance obstacles versus benefits. This interpretation is supported by the low percentage of replies (less than 12%) that indicate "simplification" (Table 6) as the second most cited change proposed. In essence, there are some issues that need to be addressed in the maintenance programme of INSPIRE, but no insurmountable problems according to this public consultation.

It is interesting also to look at the bottom of the table to see which are the issues NOT perceived to be an obstacle: these include level of ambition and long time for implementation, fitness for purpose (certification) for decision-making, and vision/maintenance.

Categories of identified obstacles / issues	Total responses	Data users	Data producers
Technical complexity (MD, web services, transformations, data specs, UML.., bandwidth)	193	171	141
Coordination: Top-down only / national /regionals coordination - cooperation	124	105	91
Communication: Lack of awareness / capacity building/INSPIRE for managers	85	71	55
Data harmonisation / too wide scope/multi ways to implement/data identification	80	63	55
Access to data - Open data - PSI - licensing - 3rd party IPRs-data sharing	66	55	42
Lack of Human resources (IT/Domain experts)	62	58	55
INSPIRE in the organisation product. line/national requirements/motivation	60	50	48
Financing - EU/ National/local - implementation is too costly also for maintenance	50	41	38
Quality / completeness/ usefulness of MD / limited use of EU Geoportal	49	44	32
Use cases - demonstrations - concrete benefits	43	28	28
Senior level / political commitment	40	33	26
Constant IT/TG development - SW missing to implement/use(WFS) - procurement difficult	32	27	22
EU Directive requirements integration (reporting eGovernment, but also out of ENV)	27	23	24
International standards interactions (OGC mainly, but also IHO, WMO)	23	16	18
Relevance of INSPIRE, too complex, not demand - user based	21	14	13
Long term vision/maintenance EU-national	15	11	10
INSPIRE data not certified for decision making / conformance/service levels	10	10	7
Ambitious road map / too long for implementation	7	7	6

Table 5: Main obstacles to INSPIRE implementation from 2014 INSPIRE Public Consultation

The differences between the views of data producers and users are very marginal: This is not too surprising considering that 70% of the respondents to the public consultation are public sector organisations, and that most are both producers and users of spatial data. Below is a statement from one respondent that summarizes the issues expressed by many:

Due to the wide scope of INSPIRE's data themes responsibility for data in-scope of INSPIRE is federated across a large number of UK local & national public

authorities……. [creating] a significant challenge in engaging with these organisations to ensure they comply. Aspects of INSPIRE's implementation contributed to this challenge: 1. Many of the UK public authorities with obligations under INSPIRE didn't have the capabilities required to publish data (skills or technology). Delays to EC guidance & the ambiguity/quality/presentation of that guidance made INSPIRE more difficult for these organisations to implement. Especially in the context of the INSPIRE deadlines & bearing in-mind the need for national variations in guidance to be made & then for the market to deliver INSPIRE solutions. 2. The technical concepts & architectural model of INSPIRE are also sometimes challenging to implement, particularly in a federated data publishing model. For example there are consistency issues in the models: the data models are focused on features yet the Directive discusses datasets, this feature focus arguably makes datasets redundant. 3. Policy join-up with other Directives has been limited this has caused some problems at member state level & has reduced opportunities to realise benefits from INSPIRE at a UK & EC level, e.g. opportunities to replace outdated Directive reporting processes through INSPIRE have been missed.

A complementary perspective to the one on obstacles is provided by the responses in the public consultation to the open question on the three changes proposed to achieve the INSPIRE objectives (Table 6).

Categories of changes proposed	Total Responses	Data users	Data Producers
Communication, sharing of best practises, demonstrations of benefits	84	68	60
Simplification of IRs, TGs, data models, use of INSPIRE Registry etc. no frequent changes	82	68	58
Improve the National coordination of INSPIRE (+ support to local governments), NSDI, thematic communities, Universities	74	61	51
Financial resources for the Implementation (EU, National level, organisational)	61	55	50
Clarification and more precision to the data scope of INSPIRE (discovery x interoperability) + protection of personal data + data quality/reliability, national datasets	54	43	37
Human resources, capacity building -trainings	53	47	44
Open data policy - support, applications, harmonisations of licenses, AAAs, download	45	35	27
INSPIRE for eReporting, eGovernment, other EU policy requirements (inter-sectorial collaboration)	41	37	32
INSPIRE validation/conformity tools for MD, Data, Services, SLDs, Persistent URIs	40	34	29
Change of internal POs working methods data management, production etc.	36	31	26
Improvement of EU Geoportal - more data!, better filters - more effective searches, better MD, better INSPIRE web site	24	21	15
Better interactions with standardisations bodies (OGS, Thematic, IT etc..)	22	19	19
Support to OS SW tools for Implementation / testing / transformation	16	16	12
Data Harmonisation (financial support, prioritisation, cross border agreements, EU data sets)	16	11	10
Support to SMEs, Private sector for new apps, services etc.	14	13	9
More realistic INSPIRE roadmap for implementation - it is	14	9	8

a process			
Negative reactions (e.g. no invoke services IR, INSPIRE, not relevant)	12	10	9
Missing EU central management organisation - operational (e.g. like EEA, Eurostat, Eurocontrol)	8	5	5
Penalty for non-compliance	6	5	3
EU projects - use of INSPIRE mandatory	4	4	3

Table 6: Main Changes proposed to achieve INSPIRE objectives from 2014 INSPIRE Public Consultation

On the benefits side (Table 7), by far the largest benefits derive from better data discovery and access, which is not surprising as Metadata and Discovery services were the first components of INSPIRE, while the data harmonisation has yet to make its effects felt.

Categories of identified benefits	Total Responses	Data users	Data producers
Better discovery/access to PSI data sets - more data available, sharing	227	194	153
Use of international GI/IT standards + their support / data interoperability -harmonisation	131	108	97
Improved EU/national/regional coordination / collaboration among PSOs/among international thematic communities/P-P partnership	121	99	86
Improvement of internal data processes (description of Data sets, production process, data quality, publication etc..)	105	90	83
Business / research opportunities, innovative apps, services on cross border etc..	70	60	41
Knowledge transfer, GI /IT capacity building, better Governmental services	49	43	40
Better decision making/env. /local planning problem solving/importance of GI	47	38	35
Running / having own geoportals, web services, better self promotion/PSOs visibility + data stays with the providers, cost saving	44	34	33
Positive support to NSDIs/legislation framework for GI/INSPIRE	43	34	28
Positive support to Open Data initiatives	31	29	25
No benefits yet	16	11	10

Table 7: Main benefits of INSPIRE implementation from 2014 INSPIRE Public Consultation

Greater interoperability through the use of international standards are important benefits, but also improvements in internal data management processes, which is important because it gives something back to those who pay the highest price. The comments expressed by the UK, and reported below, exemplify the type of benefits felt in several countries:

1. Implementation in the UK supported the growth of an open data culture. In particular the identification and cataloguing of data sets held by public authorities supported moves towards open government. Public bodies required to publish data under INSPIRE made other non-INSPIRE datasets open for sharing. We can't attribute only to INSPIRE the high volume of UK data now publicly available it has played a significant part.
2. A noticeable benefit is the publication of previously unpublished data, notably release of property data by Land Registry. It is very popular in the data user

community. Open Data User Group estimated the release of Land Registry's data would generate economic benefits up to £100 million a year. The defining of Open Standards for INSPIRE has made sharing data between organisations easier. Some standards are not necessarily of wide appeal. Many standards provide a basis for interoperability between organisations.
3. Delivering INSPIRE services needs skills and capabilities that did not exist in abundance within the public sector. GI was confined to desktop GIS and internal online GISs. For INSPIRE data publishers significantly developed skills and capabilities in metadata, data management, transformation and integration, and WMS. The increase in skills and capability is a real benefit INSPIRE is beginning to deliver. UK data publishing public bodies have started using these skills and capabilities in providing other data and information related services.

5 Conclusions

This report presented the findings of the public consultation on INSPIRE organised by the European Commission in December 2013-February 2014. Almost 700 responses were received to the consultation from public and private sector, academia, and private citizens.

We identified three tiers of respondents: an outer layer of 40% who have not been involved in the development or implementation of INSPIRE measures, a middle layer of just over one third (56% of 60%) that have been involved in the implementation of INSPIRE but not in the development of the technical specifications, and the inner core of another one third of respondents who were directly involved in implementing INSPIRE as well as the development of the Implementing Rules (IRs).

The key messages from the public consultation are:
- INSPIRE is starting to work and address the key barriers identified at the outset of this initiative that prevented the sharing and use of the spatial information needed to support environmental policies and policies affecting the environment.
- Most progress has been done in documenting data, and making such data discoverable and viewable through web services. There are however delays, particularly for Annex I and II data that should all have become available by the time of the survey. Delays are also present for Annex III, both for completing the metadata and for making data available via download services.
- The area of greater concern is the delay by the Member States in putting in place measures necessary to remove obstacles to the sharing of data at the point of use among public administrations. Only about half of the data producers indicated that such policy measure had been put in place in their organisation, and this was felt by users still finding data policy as a major barrier. Taking into consideration that such measures should have been in place since 2009, this delay is clearly significant.
- Improving communication, and sharing of best practice, reducing as far as possible complexity of technical specifications, and improving coordination are key suggested changes.
- There was almost unanimous view across all participants in the public consultation that the objectives of INSPIRE of making spatial data and services more easily shared and used are still as pertinent as ever.
- INSPIRE is delivering benefits to public administrations through improved data management processes and increased skills/competences in managing and publishing geographic information and related services.

6 Appendix: The Questionnaire

Consultation on the Implementation of the Infrastructure for Spatial Information in the European Community - INSPIRE Directive (2007/2/EC)

Dear respondent, thank you for participating in this survey. Your input is important in determining the current state of implementation of the INSPIRE directive and its further programming.

The questionnaire has two sections.

In the registration section we ask you basic information on yourself and/or the organisation you are part of, where you reside, and at what geographical scale you carry out activities using spatial data and services.

In the second section we first try to find out your level of experience with the implementation of INSPIRE, if you are - or have been involved in projects and if you contributed to preparing the Implementing Rules of INSPIRE.

Of major importance in this section is your feedback on your experiences as a USER and/or PRODUCER of spatial data and services. As the INSPIRE directive requests public authorities to share their spatial data and services with other public authorities (Article 17) and with the public through the network services (Article 11 to 14) we are particularly interested in your experiences as a user of the infrastructure. As a producer of spatial data and services we are interested to learn from you how far you have managed to implement the relevant INSPIRE measures. This may also apply to 'third party' private sector producers as the directive Article 12 grants them the possibility to link to the infrastructure. Please note that for the definition of 'public authority' and 'third party' Article 2(9),(10) of the INSPIRE directive applies.

We are also interested in your experience with the EU and national and/or regional geo-portals as gateways to the spatial data and services you need and produce.

In addition, we look forward to hearing from you on how you rate the co-ordination efforts of the EU and national governments related to the implementation of INSPIRE.

Finally, we have a few questions regarding the relevance of INSPIRE, the utility of its actions and how you evaluate their cost-efficiency. We are interested to find out if you identified positive and/or negative spill-over effects of INSPIRE in the field of environmental policy, but also in relation to other policies such as eGovernment.

You will be given the opportunity to express freely what you consider to be the major challenges, benefits and/or drawbacks of INSPIRE and to formulate some suggestions for changes to the INSPIRE framework.

Depending on the options you choose, the questionnaire will take approximately 15-20 minutes to complete.

We thank you for your interest in INSPIRE and look forward to your replies to this survey.

Please note that it is not possible to submit and save your reply until all compulsory questions have been answered. Once you open the questionnaire you have maximum 90' to respond and submit it.

Questions marked with an asterisk * require an answer to be given.

1. Registration

1.1. Name *

1.2. Email *

1.3. Are you responding as - or on behalf of *

- ○ Public sector organisation
- ○ Private sector organisation
- ○ Academic sector organisation
- ○ Private citizen
- ○ An INSPIRE National Co-ordination organisation

1.4. Name of your organisation *

1.5. Please provide a link to the website of your organisation * (maximum 256 characters)

1.6. Are you or your organisation using and/or producing spatial data and/or services (including for example publishing services or software development) for projects at the *

- ☐ international level
- ☐ national level
- ☐ regional level
- ☐ local level

1.7. Indicate the country where you legally reside or where your organisation is principally based *

- ○ Austria
- ○ Belgium
- ○ Bulgaria
- ○ Croatia
- ○ Cyprus
- ○ Czech Republic
- ○ Denmark
- ○ Estonia
- ○ Finland
- ○ France
- ○ Germany
- ○ Greece
- ○ Hungary
- ○ Iceland
- ○ Ireland
- ○ Italy
- ○ Latvia
- ○ Liechtenstein
- ○ Lithuania
- ○ Luxembourg
- ○ Malta
- ○ Netherlands
- ○ Norway
- ○ Poland
- ○ Portugal
- ○ Romania
- ○ Slovakia
- ○ Slovenia
- ○ Spain
- ○ Sweden
- ○ Switzerland
- ○ United Kingdom
- ○ Other country

1.8. Please provide the name of the country where you legally reside or where your organisation is principally based * (between 1 and 256 characters)

1.1. Your involvement and experience with INSPIRE

1.9. I or my organisation are- or have been involved in projects implementing INSPIRE measures at local, regional, national or international scale*

○ Yes   ○ No

1.10. Please provide links (URL's separeted by a ";") to the projects you and/or your organisation have been involved with (between 1 and 1200 characters)

[text input area]

1.11. Did you and/or your organisation contribute (provided expertise and/or reference documents and/or use-cases, participated in the review and/or testing) to the development of the INSPIRE Implementing Rules.*

○ Yes   ○ No

1.12. I and/or my organisation have contributed (provided expertise and/or reference documents and/or use-cases, participated in the review and/or testing) to the development of the INSPIRE Implementing Rules and/or Technical Guidance on* (at most 5 answers)

☐ Metadata   ☐ Network services   ☐ Data specifications
☐ Data policy   ☐ Monitoring and reporting

1.13. Do you or your organisation USE spatial data and/or services from a public authority or third party covered by one or more of the spatial data themes listed in the Annexes I,II,III of the INSPIRE directive?*

○ Yes   ○ No

1.14. Do you or your organisation USE spatial data and/or services from a public authority or third party NOT covered by one or more of the spatial data themes listed in the Annexes I,II,III of the INSPIRE directive? Is so, please describe the spatial data and use-case (maximum 1024 characters)

1.15. Which spatial data themes listed in Annexe I of the INSPIRE Directive cover the spatial data USED by you or your organisation? (at most 9 answers)

- [ ] 1. Coordinate reference systems
- [ ] 2. Geographical grid systems
- [ ] 3. Geographical names
- [ ] 4. Administrative units
- [ ] 5. Addresses
- [ ] 6. Cadastral parcels
- [ ] 7. Transport networks
- [ ] 8. Hydrography
- [ ] 9. Protected sites

1.16. **Coordinate reference systems** - USER experience

	Yes	No	Partially
1.16.1. is documented (has metadata) *	○	○	○
1.16.2. can be discovered through web-based services *	○	○	○
1.16.3. can be viewed through web-based services *	○	○	○
1.16.4. can be downloaded through web-based services *	○	○	○
1.16.5. comes from a public authority *	○	○	○
1.16.6. data policy (licence, charges, etc.) is no obstacle for use *	○	○	○

1.17. **Geographical grid systems** - USER experience

	Yes	No	Partially
1.17.1. is documented (has metadata) *	○	○	○
1.17.2. can be discovered through web-based services *	○	○	○
1.17.3. can be viewed through web-based services *	○	○	○
1.17.4. can be downloaded through web-based services *	○	○	○
1.17.5. comes from a public authority *	○	○	○
1.17.6. data_policy (licence, charges, etc.) is no obstacle for use *	○	○	○

1.18. **Geographical names** - USER experience

	Yes	No	Partially
1.18.1. is documented (has metadata) *	○	○	○
1.18.2. can be discovered through web-based services *	○	○	○
1.18.3. can be viewed through web-based services *	○	○	○
1.18.4. can be downloaded through web-based services *	○	○	○
1.18.5. comes from a public authority *	○	○	○
1.18.6. data_policy (licence, charges, etc.) is no obstacle for use *	○	○	○

1.19. **Administrative units** - USER experience

	Yes	No	Partially
1.19.1. is documented (has metadata) *	○	○	○
1.19.2. can be discovered through web-based services *	○	○	○
1.19.3. can be viewed through web-based services *	○	○	○
1.19.4. can be downloaded through web-based services *	○	○	○
1.19.5. comes from a public authority *	○	○	○
1.19.6. data policy (licence, charges, etc.) is no obstacle for use *	○	○	○

1.20. **Addresses** - USER experience

	Yes	No	Partially
1.20.1. is documented (has metadata) *	○	○	○
1.20.2. can be discovered through web-based services *	○	○	○
1.20.3. can be viewed through web-based services *	○	○	○
1.20.4. can be downloaded through web-based services *	○	○	○
1.20.5. comes from a public authority *	○	○	○
1.20.6. data policy (licence, charges, etc.) is no obstacle for use *	○	○	○

1.21. **Cadastral parcels** - USER experience

	Yes	No	Partially
1.21.1. is documented (has metadata) *	⊙	⊙	⊙
1.21.2. can be discovered through web-based services *	⊙	⊙	⊙
1.21.3. can be viewed through web-based services *	⊙	⊙	⊙
1.21.4. can be downloaded through web-based services *	⊙	⊙	⊙
1.21.5. comes from a public authority *	⊙	⊙	⊙
1.21.6. data policy (licence, charges, etc.) is no obstacle for use *	⊙	⊙	⊙

1.22. **Transport networks** - USER experience

	Yes	No	Partially
1.22.1. is documented (has metadata) *	⊙	⊙	⊙
1.22.2. can be discovered through web-based services *	⊙	⊙	⊙
1.22.3. can be viewed through web-based services *	⊙	⊙	⊙
1.22.4. can be downloaded through web-based services *	⊙	⊙	⊙
1.22.5. comes from a public authority *	⊙	⊙	⊙
1.22.6. data policy (licence, charges, etc.) is no obstacle for use *	⊙	⊙	⊙

1.23. **Hydrography** - USER experience

	Yes	No	Partially
1.23.1. is documented (has metadata) *	○	○	○
1.23.2. can be discovered through web-based services *	○	○	○
1.23.3. can be viewed through web-based services *	○	○	○
1.23.4. can be downloaded through web-based services *	○	○	○
1.23.5. comes from a public authority *	○	○	○
1.23.6. data policy (licence, charges, etc.) is no obstacle for use *	○	○	○

1.24. **Protected sites** - USER experience

	Yes	No	Partially
1.24.1. is documented (has metadata) *	○	○	○
1.24.2. can be discovered through web-based services *	○	○	○
1.24.3. can be viewed through web-based services *	○	○	○
1.24.4. can be downloaded through web-based services *	○	○	○
1.24.5. comes from a public authority *	○	○	○
1.24.6. data policy (licence, charges, etc.) is no obstacle for use *	○	○	○

1.25. Which spatial data themes listed in Annexe II of the INSPIRE Directive cover the spatial data USED by you or your organisation? (at most 4 answers)

☐ 1.Elevation ☐ 2. Land cover ☐ 3. Ortho-imagery ☐ 4. Geology

1.26. Elevation - USER experience

	Yes	No	Partially
1.26.1. is documented (has metadata) *	○	○	○
1.26.2. can be discovered through web-based services *	○	○	○
1.26.3. can be viewed through web-based services *	○	○	○
1.26.4. can be downloaded through web-based services *	○	○	○
1.26.5. comes from a public authority *	○	○	○
1.26.6. data policy (licence, charges, etc.) is no obstacle for use *	○	○	○

1.27. Land cover - USER experience

	Yes	No	Partially
1.27.1. is documented (has metadata) *	○	○	○
1.27.2. can be discovered through web-based services *	○	○	○
1.27.3. can be viewed through web-based services *	○	○	○
1.27.4. can be downloaded through web-based services *	○	○	○
1.27.5. comes from a public authority *	○	○	○
1.27.6. data policy (licence, charges, etc.) is no obstacle for use *	○	○	○

1.28. **Ortho-imagery** - USER experience

	Yes	No	Partially
1.28.1. is documented (has metadata) *	○	○	○
1.28.2. can be discovered through web-based services *	○	○	○
1.28.3. can be viewed through web-based services *	○	○	○
1.28.4. can be downloaded through web-based services *	○	○	○
1.28.5. comes from a public authority *	○	○	○
1.28.6. data policy (licence, charges, etc.) is no obstacle for use *	○	○	○

1.29. **Geology** - USER experience

	Yes	No	Partially
1.29.1. is <u>documented</u> (has metadata) *	○	○	○
1.29.2. can be <u>discovered</u> through web-based services *	○	○	○
1.29.3. can be <u>viewed</u> through web-based services *	○	○	○
1.29.4. can be <u>downloaded</u> through web-based services *	○	○	○
1.29.5. comes from a public authority *	○	○	○
1.29.6. <u>data policy</u> (licence, charges, etc.) is <u>no obstacle</u> for use *	○	○	○

1.30. Which spatial data themes listed in Annexe III of the INSPIRE Directive cover the spatial data USED by you or your organisation? (at most 21 answers)

☐ 1. Statistical units	☐ 2. Buildings	☐ 3. Soil
☐ 4. Land use	☐ 5. Human health and safety	☐ 6. Utility and governmental services
☐ 7. Environmental monitoring facilities	☐ 8. Production and industrial facilities	☐ 9. Agricultural and aquaculture facilities
☐ 10. Population distribution – demography	☐ 11. Area management/ restriction/regulation zones & reporting units	☐ 12. Natural risk zones
☐ 13. Atmospheric conditions	☐ 14. Meteorological geographical features	☐ 15. Oceanographic geographical features
☐ 16. Sea regions	☐ 17. Bio-geographical regions	☐ 18. Habitats and biotopes
☐ 19. Species distribution	☐ 20. Energy Resources	☐ 21. Mineral resources

1.31. **Statistical units** - USER experience

	Yes	No	Partially
1.31.1. is documented (has metadata) *	○	○	○
1.31.2. can be discovered through web-based services *	○	○	○
1.31.3. can be viewed through web-based services *	○	○	○
1.31.4. can be downloaded through web-based services *	○	○	○
1.31.5. comes from a public authority *	○	○	○
1.31.6. data policy (licence, charges, etc.) is no obstacle for use *	○	○	○

1.32. **Buildings** - USER experience

	Yes	No	Partially
1.32.1. is documented (has metadata) *	○	○	○
1.32.2. can be discovered through web-based services *	○	○	○
1.32.3. can be viewed through web-based services *	○	○	○
1.32.4. can be downloaded through web-based services *	○	○	○
1.32.5. comes from a public authority	○	○	○
1.32.6. data policy (licence, charges, etc.) is no obstacle for use *	○	○	○

1.33. **Soil** - USER experience

	Yes	No	Partially
1.33.1. is documented (has metadata) *	○	○	○
1.33.2. can be discovered through web-based services *	○	○	○
1.33.3. can be viewed through web-based services *	○	○	○
1.33.4. can be downloaded through web-based services *	○	○	○
1.33.5. comes from a public authority *	○	○	○
1.33.6. data policy (licence, charges, etc.) is no obstacle for use *	○	○	○

1.34. **Land use** - USER experience

	Yes	No	Partially
1.34.1. is documented (has metadata) *	○	○	○
1.34.2. can be discovered through web-based services *	○	○	○
1.34.3. can be viewed through web-based services *	○	○	○
1.34.4. can be downloaded through web-based services *	○	○	○
1.34.5. comes from a public authority *	○	○	○
1.34.6. data policy (licence, charges, etc.) is no obstacle for use *	○	○	○

1.35. **Human health and safety** - USER experience

	Yes	No	Partially
1.35.1. is documented (has metadata) *	○	○	○
1.35.2. can be discovered through web-based services *	○	○	○
1.35.3. can be viewed through web-based services *	○	○	○
1.35.4. can be downloaded through web-based services *	○	○	○
1.35.5. comes from a public authority *	○	○	○
1.35.6. data policy (licence, charges, etc.) is no obstacle for use *	○	○	○

1.36. **Utility and governmental services** - USER experience

	Yes	No	Partially
1.36.1. is documented (has metadata) *	○	○	○
1.36.2. can be discovered through web-based services *	○	○	○
1.36.3. can be viewed through web-based services *	○	○	○
1.36.4. can be downloaded through web-based services *	○	○	○
1.36.5. comes from a public authority *	○	○	○
1.36.6. data policy (licence, charges, etc.) is no obstacle for use *	○	○	○

1.37. **Environmental monitoring facilities** - USER experience

	Yes	No	Partially
1.37.1. is documented (has metadata) *	○	○	○
1.37.2. can be discovered through web-based services *	○	○	○
1.37.3. can be viewed through web-based services *	○	○	○
1.37.4. can be downloaded through web-based services *	○	○	○
1.37.5. comes from a public authority *	○	○	○
1.37.6. data policy (licence, charges, etc.) is no obstacle for use *	○	○	○

1.38. **Production and industrial facilities** - USER experience

	Yes	No	Partially
1.38.1. is documented (has metadata) *	○	○	○
1.38.2. can be discovered through web-based services *	○	○	○
1.38.3. can be viewed through web-based services *	○	○	○
1.38.4. can be downloaded through web-based services *	○	○	○
1.38.5. comes from a public authority *	○	○	○
1.38.6. data policy (licence, charges, etc.)is no obstacle for use *	○	○	○

1.39. **Agricultural and aquaculture facilities** - USER experience

	Yes	No	Partially
1.39.1. is documented (has metadata) *	○	○	○
1.39.2. can be discovered through web-based services *	○	○	○
1.39.3. can be viewed through web-based services *	○	○	○
1.39.4. can be downloaded through web-based services *	○	○	○
1.39.5. comes from a public authority *	○	○	○
1.39.6. data policy (licence, charges, etc.) is no obstacle for use *	○	○	○

1.40. **Population distribution - demography** - USER experience

	Yes	No	Partially
1.40.1. is documented (has metadata) *	○	○	○
1.40.2. can be discovered through web-based services *	○	○	○
1.40.3. can be viewed through web-based services *	○	○	○
1.40.4. can be downloaded through web-based services *	○	○	○
1.40.5. comes from a public authority *	○	○	○
1.40.6. data policy (licence, charges, etc.) is no obstacle for use *	○	○	○

1.41. Area management/restriction/regulation zones & reporting units - USER experience

	Yes	No	Partially
1.41.1. is documented (has metadata) *	○	○	○
1.41.2. can be discovered through web-based services *	○	○	○
1.41.3. can be viewed through web-based services *	○	○	○
1.41.4. can be downloaded through web-based services *	○	○	○
1.41.5. comes from a public authority *	○	○	○
1.41.6. data policy (licence, charges, etc.) is no obstacle for use *	○	○	○

1.42. **Natural risk zones** - USER experience

	Yes	No	Partially
1.42.1. is <u>documented</u> (has metadata) *	○	○	○
1.42.2. can be <u>discovered</u> through web-based services *	○	○	○
1.42.3. can be <u>viewed</u> through web-based services *	○	○	○
1.42.4. can be <u>downloaded</u> through web-based services *	○	○	○
1.42.5. comes from a public authority *	○	○	○
1.42.6. <u>data policy</u> (licence, charges, etc.) is <u>no obstacle</u> for use *	○	○	○

1.43. **Atmospheric conditions** - USER experience

	Yes	No	Partially
1.43.1. is <u>documented</u> (has metadata) *	○	○	○
1.43.2. can be <u>discovered</u> through web-based services *	○	○	○
1.43.3. can be <u>viewed</u> through web-based services *	○	○	○
1.43.4. can be <u>downloaded</u> through web-based services *	○	○	○
1.43.5. comes from a public authority *	○	○	○
1.43.6. <u>data policy</u> (licence, charges, etc.) is <u>no obstacle</u> for use *	○	○	○

1.44. **Meteorological geographical features** - USER experience

	Yes	No	Partially
1.44.1. is <u>documented</u> (has metadata) *	⊙	⊙	⊙
1.44.2. can be <u>discovered</u> through web-based services *	⊙	⊙	⊙
1.44.3. can be <u>viewed</u> through web-based services *	⊙	⊙	⊙
1.44.4. can be <u>downloaded</u> through web-based services *	⊙	⊙	⊙
1.44.5. comes from a public authority *	⊙	⊙	⊙
1.44.6. <u>data policy</u> (licence, charges, etc.) is <u>no obstacle</u> for use *	⊙	⊙	⊙

1.45. **Oceanographic geographical features** - USER experience

	Yes	No	Partially
1.45.1. is <u>documented</u> (has metadata) *	⊙	⊙	⊙
1.45.2. can be <u>discovered</u> through web-based services *	⊙	⊙	⊙
1.45.3. can be <u>viewed</u> through web-based services *	⊙	⊙	⊙
1.45.4. can be <u>downloaded</u> through web-based services *	⊙	⊙	⊙
1.45.5. comes from a public authority *	⊙	⊙	⊙
1.45.6. <u>data policy</u> (licence, charges, etc.) is <u>no obstacle</u> for use *	⊙	⊙	⊙

1.46. **Sea Regions** - USER experience

	Yes	No	Partially
1.46.1. is documented (has metadata) *	○	○	○
1.46.2. can be discovered through web-based services *	○	○	○
1.46.3. can be viewed through web-based services *	○	○	○
1.46.4. can be downloaded through web-based services *	○	○	○
1.46.5. comes from a public authority *	○	○	○
1.46.6. data policy (licence, charges, etc.) is no obstacle for use *	○	○	○

1.47. **Bio-geographical regions** - USER experience

	Yes	No	Partially
1.47.1. is documented (has metadata) *	○	○	○
1.47.2. can be discovered through web-based services *	○	○	○
1.47.3. can be viewed through web-based services *	○	○	○
1.47.4. can be downloaded through web-based services *	○	○	○
1.47.5. comes from a public authority *	○	○	○
1.47.6. data policy (licence, charges, etc.) is no obstacle for use *	○	○	○

1.48. **Habitats and biotopes** - USER experience

	Yes	No	Partially
1.48.1. is documented (has metadata) *	○	○	○
1.48.2. can be discovered through web-based services *	○	○	○
1.48.3. can be viewed through web-based services *	○	○	○
1.48.4. can be downloaded through web-based services *	○	○	○
1.48.5. comes from a public authority *	○	○	○
1.48.6. data policy (licence, charges, etc.) is no obstacle for use *	○	○	○

1.49. **Species distribution** - USER experience

	Yes	No	Partially
1.49.1. is documented (has metadata) *	○	○	○
1.49.2. can be discovered through web-based services *	○	○	○
1.49.3. can be viewed through web-based services *	○	○	○
1.49.4. can be downloaded through web-based services *	○	○	○
1.49.5. comes from a public authority *	○	○	○
1.49.6. data policy (licence, charges, etc.) is no obstacle for use *	○	○	○

1.50. **Energy resources** - USER experience

	Yes	No	Partially
1.50.1. is documented (has metadata) *	○	○	○
1.50.2. can be discovered through web-based services *	○	○	○
1.50.3. can be viewed through web-based services *	○	○	○
1.50.4. can be downloaded through web-based services *	○	○	○
1.50.5. comes from a public authority *	○	○	○
1.50.6. data policy (licence, charges, etc.) is no obstacle for use *	○	○	○

1.51. **Mineral resources** - USER experience

	Yes	No	Partially
1.51.1. is documented (has metadata) *	○	○	○
1.51.2. can be discovered through web-based services *	○	○	○
1.51.3. can be viewed through web-based services *	○	○	○
1.51.4. can be downloaded through web-based services *	○	○	○
1.51.5. comes from a public authority *	○	○	○
1.51.6. data policy (licence, charges, etc.) is no obstacle for use *	○	○	○

1.52. I have used the EU geo-portal to access spatial data *

○ Yes   ○ No

1.53. I have not used the EU geo-portal because (maximum 512 characters)

1.54. I have used the EU geo-portal and was able to

a: Agree strongly

b: Agree

c: No opinion

d: Disagree

e: Disagree strongly

	a	b	c	d	e
1.54.1. Discover the spatial data that I need as well as the conditions for use and other relevant documentation (metadata) *	○	○	○	○	○
1.54.2. View (display) the spatial data that I need *	○	○	○	○	○
1.54.3. Download the spatial data that I need *	○	○	○	○	○

1.55. I have used other international, national or regional geo-portals to access spatial data *

○ Yes   ○ No

1.56. I have used other international, national or regional geo-portals to access spatial data and was able to

a: Agree strongly
b: Agree
c: No opinion
d: Disagree
e: Disagree strongly

	a	b	c	d	e
1.56.1. Discover the spatial data that I need as well as the conditions for use and other relevant documentation (metadata) *	○	○	○	○	○
1.56.2. View (display) the spatial data that I need *	○	○	○	○	○
1.56.3. Download the spatial data that I need *	○	○	○	○	○

1.57. Do you or your organisation PRODUCE spatial data and services covered by one or more of the spatial data themes listed in the Annexes I,II,III of the INSPIRE Directive? *

○ Yes   ○ No

1.58. Which spatial data themes listed in Annexe I of the INSPIRE Directive cover the spatial data PRODUCED by you or your organisation? (at most 9 answers)

☐ 1. Coordinate reference systems   ☐ 2. Geographical grid systems   ☐ 3. Geographical names

☐ 4. Administrative units   ☐ 5. Addresses   ☐ 6. Cadastral parcels

☐ 7. Transport networks   ☐ 8. Hydrography   ☐ 9. Protected sites

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1.59. Which spatial data themes listed in Annexe II of the INSPIRE Directive cover the spatial data PRODUCED by you or your organisation? (at most 4 answers)

☐ 1.Elevation   ☐ 2. Land cover   ☐ 3. Ortho-imagery   ☐ 4. Geology

1.60. Which spatial data themes listed in Annexe III of the INSPIRE Directive cover the spatial data PRODUCED by you or your organisation? (at most 21 answers)

- [ ] 1. Statistical units
- [ ] 2. Buildings
- [ ] 3. Soil
- [ ] 4. Land use
- [ ] 5. Human health and safety
- [ ] 6. Utility and governmental services
- [ ] 7. Environmental monitoring facilities
- [ ] 8. Production and industrial facilities
- [ ] 9. Agricultural and aquaculture facilities
- [ ] 10. Population distribution – demography
- [ ] 11. Area management/ restriction/regulation zones & reporting units
- [ ] 12. Natural risk zones
- [ ] 13. Atmospheric conditions
- [ ] 14. Meteorological geographical features
- [ ] 15. Oceanographic geographical features
- [ ] 16. Sea regions
- [ ] 17. Bio-geographical regions
- [ ] 18. Habitats and biotopes
- [ ] 19. Species distribution
- [ ] 20. Energy Resources
- [ ] 21. Mineral resources

1.61. My organisation has a data policy (licensing, charging, copyright, etc.) which allows public authority organisations in my country to access and use its spatial data and services without restrictions likely to create practical obstacles for their use *

- ( ) Yes
- ( ) No
- ( ) Partially

1.62. Please indicate the % of your spatial datasets and services for which there are no restrictions likely to create obstacles to their use *

- ( ) >76%
- ( ) 51-75%
- ( ) 26-50%
- ( ) < 25%
- ( ) do not know

1.63. The data policies of my organisation (licensing, charging, copyright, etc.) which allow public organisations in my country to access, exchange and use its spatial data and services are also open on equal terms to public authorities of other EU Member States, to the EU institutions and bodies, and to bodies established by international agreements to which the EU and Member States are parties *

- ( ) Yes
- ( ) No
- ( ) Partially

1.64. The spatial datasets and services of my organisation are documented (have metadata) *

- ( ) Yes
- ( ) No
- ( ) Partially

1.65. The documentation of the spatial datasets and services of my organisation is compliant with the INSPIRE implementing rules on metadata *

- ( ) Yes
- ( ) No
- ( ) Partially

1.66. Please indicate the % of your spatial datasets and services which are documented (have metadata) *

- ○ >76%
- ○ 51-75%
- ○ 26-50%
- ○ < 25%
- ○ do not know

1.67. The spatial datasets and services of my organisation are discoverable through web-based services *

- ○ Yes
- ○ No
- ○ Partially

1.68. Please indicate the % of your spatial datasets and services which is discoverable through web-based services *

- ○ >76%
- ○ 51-75%
- ○ 26-50%
- ○ < 25%
- ○ do not know

1.69. The web-based services through which the spatial datasets and services of my organisation can be discovered are compliant with the INSPIRE implementing rule on network services *

- ○ Yes
- ○ No
- ○ Partially

1.70. The spatial datasets of my organisation can be viewed (displayed) through web-based services *

- ○ Yes
- ○ No
- ○ Partially

1.71. Please indicate the % of your spatial datasets which can be viewed (displayed) through web-based services *

- ○ >76%
- ○ 51-75%
- ○ 26-50%
- ○ < 25%
- ○ do not know

1.72. The web-based services through which the spatial datasets of my organisation can be viewed (displayed) are compliant with the INSPIRE implementing rule on network services *

- ○ Yes
- ○ No
- ○ Partially

1.73. The spatial data of my organisation can be downloaded through web-based services *

- ○ Yes
- ○ No
- ○ Partially

1.74. Please indicate the % of your spatial datasets which can be can be downloaded through web-based services *

- ○ >76%
- ○ 51-75%
- ○ 26-50%
- ○ < 25%
- ○ do not know

1.75. The web-based services through which the spatial datasets of my organisation can be downloaded are compliant with the INSPIRE implementing rule on network services *

○ Yes   ○ No   ○ Partially

1.76. My organisation has restructured its spatial datasets according to the INSPIRE data specifications or has implemented transformation services *

○ Yes   ○ No   ○ Partially

1.77. Please indicate the **%** of spatial datasets which you and/or your organisation have restructured according to the INSPIRE data specifications or for which transformation services have been set up *

○ >76%   ○ 51-75%   ○ 26-50%   ○ < 25%   ○ do not know

1.78. The spatial datasets and services of my organisation can be discovered and accessed through the EU-INSPIRE geo-portal *

○ Yes   ○ No   ○ Partially

1.79. Please indicate the **%** of your spatial datasets and services which can be discovered and accessed through the EU-INSPIRE geo-portal *

○ >76%   ○ 51-75%   ○ 26-50%   ○ < 25%   ○ do not know

1.80. The spatial datasets and services of my organisation can be discovered and accessed through the national and/or regional geo-portal *

○ Yes   ○ No   ○ Partially

1.81. Please indicate the **%** of your spatial datasets and services which can be discovered and accessed through the national and/or regional geo-portal *

○ >76%   ○ 51-75%   ○ 26-50%   ○ < 25%   ○ do not know

1.82. INSPIRE co-ordination

a: Agree strongly
b: Agree
c: No opinion
d: Disagree
e: Disagree strongly

	a	b	c	d	e
1.82.1. The implementation of INSPIRE is well co-ordinated in my country *	○	○	○	○	○
1.82.2. The implementation of INSPIRE is well co-ordinated between my country and its neighbouring countries *	○	○	○	○	○
1.82.3. The implementation of INSPIRE is well co-ordinated at EU level by the Commission assisted by relevant organisations, in particular the European Environment Agency *	○	○	○	○	○

1.83. My opinion on INSPIRE

a: Agree strongly
b: Agree
c: No opinion
d: Disagree
e: Disagree strongly

	a	b	c	d	e
1.83.1. The objectives of INSPIRE of making spatial data and services more easily shared and used are still pertinent *	○	○	○	○	○
1.83.2. The actions foreseen by INSPIRE are still appropriate to meet its objectives *	○	○	○	○	○
1.83.3. INSPIRE has helped me/my organisation in becoming more efficient and effective *	○	○	○	○	○

1.83.4. INSPIRE has stimulated the use of the spatial data and services *	◉	◉	◉	◉	◉
1.83.5. INSPIRE has improved the availability and accessibility of spatial data and services *	◉	◉	◉	◉	◉
1.83.6. INSPIRE makes it easier to find and use spatial data and services in cross-border areas *	◉	◉	◉	◉	◉
1.83.7. The benefits of INSPIRE will be greater than the costs *	◉	◉	◉	◉	◉
1.83.8. INSPIRE improves access to the information needed for environmental policies and decisions *	◉	◉	◉	◉	◉
1.83.9. INSPIRE also improves access to the information needed for other (non-environmental) policies and decisions *	◉	◉	◉	◉	◉
1.83.10. INSPIRE contributes to a more open policy for public sector data *	◉	◉	◉	◉	◉
1.83.11. INSPIRE contributes to more innovative applications and services using spatial data *	◉	◉	◉	◉	◉
1.83.12. INSPIRE contributes to more general eGovernment activities *	◉	◉	◉	◉	◉

1.84. Please feel free to describe (if possible in English) the 3 biggest challenges you and/or your organisation encountered on INSPIRE (between 1 and 1500 characters)

1.85. Please feel free to describe (if possible in English) the 3 biggest benefits of INSPIRE for you and/or your organisations (maximum 1500 characters)

1.86. Please feel free to describe (if possible in English) up to 3 changes which you and/or your organisation would consider necessary to achieve the INSPIRE objectives (between 1 and 1500 characters)

Useful links

For more information on INSPIRE, visit the INSPIRE website: http://inspire.jrc.ec.europa.eu/

European Commission

Joint Research Centre – Institute for Environment and Sustainability

Title: INSPIRE Public Consultation 2014: Report of Findings

Author(s): Max Craglia, Elena Roglia and Robert Tomas

Abstract

This report presented the findings of the public consultation on INSPIRE organised by the European Commission in December 2013-February 2014. Almost 700 responses were received to the consultation from public and private sector, academia, and private citizens.

The key messages from the public consultation are:

- INSPIRE is starting to work and address the key barriers identified at the outset of this initiative that prevented the sharing and use of the spatial information needed to support environmental policies and policies affecting the environment.
- Most progress has been done in documenting data, and making such data discoverable and viewable through web services. There are however delays, particularly for Annex I and II data that should all have become available by the time of the survey. Delays are also present for Annex III, both for completing the metadata and for making data available via download services.
- The area of greater concern is the delay by the Member States in putting in place measures necessary to remove obstacles to the sharing of data at the point of use among public administrations. Only about half of the data producers indicated that such policy measure had been put in place in their organisation, and this was felt by users still finding data policy as a major barrier. Taking into consideration that such measures should have been in place since 2009, this delay is clearly significant.
- Improving communication, and sharing of best practice, reducing as far as possible complexity of technical specifications, and improving coordination are key suggested changes.
- There was almost unanimous view across all participants in the public consultation that the objectives of INSPIRE of making spatial data and services more easily shared and used are still as pertinent as ever.
- INSPIRE is delivering benefits to public administrations through improved data management processes and increased skills/competences in managing and publishing geographic information and related services.

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