EJP SOIL

European Joint Programme

Towards climate-smart sustainable management of agricultural soils

Deliverable 6.2

Report on the national and EU regulations on agricultural soil data sharing and national monitoring activities

Due date of deliverable: M18

Actual submission date: 29.07.2021

GENERAL DATA

Grant Agreement: 862695
Project acronym: EJP SOIL
Project title: Towards climate-smart sustainable management of agricultural soils
Project website: www.ejpsoil.eu

Start date of the project: February 1st, 2020
Project duration: 60 months
Name of lead contractor: INRAE

Funding source: H2020-SFS-2018-2020 / H2020-SFS-2019-1
Type of action: European Joint Project COFUND

DELIVERABLE NUMBER:	6.2
DELIVERABLE TITLE:	Report on the national and EU regulations on agricultural soil data sharing and national monitoring activities
DELIVERABLE TYPE:	Report
WORK PACKAGE N:	WP6
WORK PACKAGE TITLE:	Supporting harmonised soil information and reporting
DELIVERABLE LEADER:	M. Fantappiè, CREA
EDITED BY:	M. Fantappiè, G. Peruginelli, S. Conti, S. Rennes, F. van Egmond, and C. Le Bas
DISSEMINATION LEVEL:	PU

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

Authors (alphabetical order):

K. Armolaitis[16] (Answering to the questionnaire)
F. Assennato[29] (Answering to the questionnaire)
Z. Bakacsi[12] (Answering to the questionnaire)
A. Baumgarten[3] (Answering to the questionnaire)
P. Bezak[20] (Answering to the questionnaire)
A. Bispo[1] (Answering to the questionnaire, Revising the deliverable)
K. Blomback[23] (Answering to the questionnaire)
N. Borchard[9] (Answering to the questionnaire)
S. Brenna[28] (Answering to the questionnaire)
J.D. Bulens[2] (Answering to the questionnaire, Revising the deliverable)
F. Calouro[19] (Answering to the questionnaire)
N. Castanheira[19] (Answering to the questionnaire)
C. Chenu[1] (Revising the deliverable)
M. da Conceição Gonçalves[19] (Answering to the questionnaire)
S. Conti[27] (Developing the questionnaire, Editing the deliverable)
A. Don[10] (Answering to the questionnaire)
F. van Egmond[2] (Developing the questionnaire, Editing and revising the deliverable)
M. Fantappiè[14] (Developing, and answering to the questionnaire, Editing the deliverable)
V. Feiza[16] (Answering to the questionnaire)
H. Forsberg Mathiesen[17] (Answering to the questionnaire)
G. de Freitas Leal[31] (Answering to the questionnaire)
C. Garcia[22] (Answering to the questionnaire)
L. Gardin[27 32] (Answering to the questionnaire)
G. Garland[24] (Answering to the questionnaire)
R. Gerasina[1] (Editing the deliverable)
H. P. Haslmayr[3] (Answering to the questionnaire, Revising the deliverable)
A Higgins[26] (Answering to the questionnaire)
B. Houskova[20] (Answering to the questionnaire)
Z. Kadziuliene[16] (Answering to the questionnaire)
R. Kasparinskis[15] (Answering to the questionnaire)
P. Koza[18] (Answering to the questionnaire)
K. Kyllma[23] (Answering to the questionnaire)
C. Le Bas[1] (Developing, and answering to the questionnaire)
A. Lehtonen[9] (Answering to the questionnaire)
S. Madenoglu[25] (Answering to the questionnaire)
E. Nurmi[9] (Answering to the questionnaire)
J. Okx[2] (Answering to the questionnaire)
K. Oorst[4] (Answering to the questionnaire, Revising the deliverable)
L. O'Sullivan[13] (Answering to the questionnaire)
H. Ozcan[25] (Answering to the questionnaire)

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

L. Pasztor[12] (Answering to the questionnaire)
A. Paz[22] (Answering to the questionnaire)
V. Penížek[6] (Answering to the questionnaire)
G. Peruginelli[27] (Developing the questionnaire, Editing the deliverable)
B. Pirko[12] (Answering to the questionnaire)
C. Poeplau[10] (Answering to the questionnaire)
S. Rennes[1] (Developing, and answering to the questionnaire, Editing and revising the deliverable)
G. Ruysschaert[4] (Answering to the questionnaire)
F. Schneider[10] (Answering to the questionnaire)
G. Siebielec[18] (Answering to the questionnaire)
R. Skalský[20] (Answering to the questionnaire)
B. Smreczak[18] (Answering to the questionnaire, Revising the deliverable)
S. Svendgård-Stokke[17] (Answering to the questionnaire)
M. Svicek[20] (Answering to the questionnaire)
M. Tello[22] (Answering to the questionnaire)
B. Tóth[12] (Answering to the questionnaire)
M. Tulipan[3] (Answering to the questionnaire)
M. Vandamme[4] (Answering to the questionnaire)
B. Vrscaj[30] (Answering to the questionnaire)
D. Wall[13] (Answering to the questionnaire)
R. Wawer[18] (Answering to the questionnaire)
J. Wetterlind[23] (Answering to the questionnaire, Revising the deliverable)

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

Affiliations

No	Abbreviation	Name	(linked) third party to
1	INRAE	Institut national de la recherche agronomique	
2	WR	Wageningen Research	
3	BIOS	BIOS Science Austria (Association for the Advancement of Life Sciences)	
4	EV-ILVO	Own capital of the institute for agricultural and fisheries research / Eigen Vermogen van het Instituut voor Landbouw en Visserij Onderzoek (EV ILVO)	
6	CZU	Czech University of Life Sciences Prague / Ceska zemedelska univerzita v Praze	
9	LUKE	Natural Resource Institute of Finland / Luonnonvarakeskus	
10	Thuenen	Johann Heinrich von Thünen Institut Bundesforschungsinstitut für Ländliche Räume, Wald und Fischerei	
12	MTA ATK	Magyar Tudományos Akadémia, Agrártudományi Kutatóközpont	
13	Teagasc	Agriculture and Food Development Authority	
14	CREA	Council for Agricultural Research and Economics / Consiglio per la ricerca in agricoltura e l'analisi dell'economia agraria	
15	UL	University of Latvia, Faculty of Geography and Earth Sciences	
16	LAMMC	Lithuanian Research Centre for Agriculture and Forestry, Lietuvos agrarinių Ir mišku mokslų centras	
17	NIBIO	Norwegian Institute of Bioeconomy, Norsk Institutt for Biookonomi	
18	IUNG	Institute of Soil Science and Plant Cultivation	
19	INIAV	National Institute of Agricultural and Veterinarian Investigations, Instituto Nacional de Investigaçao Agraria e Veterinaria	
20	NPPC	National Agricultural and Food Centre	
22	INIA/CSIC	Spanish National Research Council	
23	SLU	Swedish University of Agricultural Sciences	
24	AGS	Federal Department for Business Education and Research, Eidgenoessisches Deapartement fuer Wirtschaft Bildung und Research	
25	TAGEM	Ministry of Agriculture and Forestry/General Directorate of Agricultural Research and Policies	
26	AFBI	Agrifood and Biosciences Institute	
27	CNR	National Research Council / Consiglio Nazionale delle Ricerche	CREA

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

28	ERSAF	Regional Agency for Agriculture and Forests of Lombardy	CREA
29	ISPRA	Italian National Institute for Environmental Protection and Research	CREA
30	KIS	Agricultural Institute of Slovenia / Kmetijski Inštitut Slovenije	ULBF
31	DGADR	General Directorate of Agriculture and Rural Development/ Direção-Geral de Agricultura e Desenvolvimento Rural	External institution
32	LAMMA	Consorzio LAMMA, Regione Toscana, Italy	External institution

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

Table of Contents

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

List of Tables

This project has received funding from the European Union’s Horizon 2020 research and innovation programme under grant agreement N° 862695

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

List of Figures

List of acronyms and abbreviations

AT	Austria
BE-FL	Belgium-Flanders
CH	Switzerland
CZ	Czech Republic
DE	Germany
DK	Denmark
EE	Estonia
EFTA	European Free Trade Association
ES	Spain
EU	European Union
FI	Finland
FR	France
HU	Hungary
IE	Ireland

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

IT	Italy
LT	Lithuania
LV	Latvia
MS	Member State
NL	Netherlands
NO	Norway
PL	Poland
PT	Portugal
SE	Sweden
SI	Slovenia
SK	Slovakia
TR	Turkey
UK	United Kingdom
WP	Work Package

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

Executive summary

Following the Aarhus Convention of 1998, several European Directives have been approved with the aim to promote the release of the spatial data held by public authorities and improve evidence-based environmental policymaking. Among these, the most relevant EU-Directives were the European Directive 2003/04/EC 'on public access to environmental information', the Directive 2007/2/EC 'on establishing an Infrastructure for Spatial Information in the European Community (INSPIRE)', and the Directive 1024/2019/EC on open data and re-use of public sector information, known as the Open Data Directive. The aim of the present deliverable was to analyse the state of implementation of the above mentioned EU-Directives and the implications linked to their transposition in relation to soil information. Agricultural soils are usually under private property in Europe, therefore the public right to have access to environmental information, must be balanced with the right of landowners in relation to their properties. Member States are allowed to a certain flexibility in the transposition of EU-Directives, given their national legislations, therefore the national transposition may be changed substantially.

After an overview of the regulatory framework at supranational level, and a review of literature and previous projects on the topic, the main activity carried out for this deliverable preparation was the development, distribution, and analysis of an *ad hoc* questionnaire sent to EJP SOIL partners. The final aim was to draft a general agreement for soil data sharing among EJP SOIL partners, between EJP SOIL partners and other institutions at national level owning/holding soil data, and in relation to external EU public institutions, such as EU DGs, EEA-EIONET, and JRC-ESDAC.

Analyzing the questionnaire answers, complemented with information retrieved from EU official web-sites, we found that the EU Directives 2003/04/EC and 2007/2/EC have been transposed in all the EJP SOIL Member State countries (with the exception of the 2003/4/EC for Sweden), in UK (MS up to the 31/01/2020), and even in Norway (EFTA member). Switzerland (EFTA member) has not transposed these two Directives, but has adopted the Aarhus convention, and has adopted a special law on geoinformation analogous to the INSPIRE Directive. With the questionnaire we investigated on the existence of specific national transpositions of the Directive 2003/4/EC in relation to soil, to understand how the conflict between public and private interests had been eventually settled. As the result, we evidenced the lack of specific national transpositions of the Directive 2003/4/EC in relation to soil. The tackling of this conflict of interest was, therefore, to be analysed inside the generic national legislations, and by analysing the concrete implementations of the EU directives given by the EJP SOIL countries in relation to soil information. The analysis of the concrete implementations was performed considering some determinant concepts, and particular key provisions, included in the EU-Directives.

Following the Article 3(5) of the Directive 2003/4/EC the Member States *should design **information officers** required to support the public in seeking access to information, should publish lists of public authorities (responsible for the environmental information), should establish and maintain **facilities** for the examination of the information, should establish and maintain **registers or lists** of the environmental information held by public authorities or information points, with clear indications of where such information can be found. All the above with the aim to ensure that the right of access to*

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

environmental information can be effectively exercised. Therefore, we have investigated on the existence of ***soil information officers***, that is, information officers devoted specifically to soil information. We investigated on their existence, either in the case they were officially designed (pursuant the Directive 2003/4/EC), or in the case they were "*de facto*" acting as. We have also investigated on the existence of maintained ***public registers of soil information***. We found that the majority of EJP SOIL countries had ***"de facto" soil officers***, and that the term "***officer***" and its role were intended with different meanings by the respondents to the questionnaire. The terms "***registers***" and "***facilities***" were also subject to different interpretations, but the majority intended register as metadata registers, and facilities as online portals (network of services). We found that metadata registers and/or network of services for the examination of environmental data, as foreseen by the INSPIRE Directive, were available and maintained by the large majority of the EJP SOIL countries. Although their maintenance evidenced the need for capacity building and financial support, but the availability of soil spatial data inside those registers and facilities was less than the real information owned/hold in the European public institutions.

We investigated on the adoption of ***standards to ensure interoperability or harmonisation of spatial data sets*** (on the base of the art 7. Directive 2007/2/EC), ***and*** on the adoption of such standards ***specifically to the soil theme***. We found a general lack of knowledge of this topic by the respondents, several respondents explicitly declaring their self-ignorance, other giving misleading answers. In relation to the standard specific for soil only Switzerland, Italy, Netherlands, and Norway gave specific references, and only Italy cited the D2.8.III.3 Data Specification on Soil – Technical Guidelines. Even the terms "***soil***" and "***subsoil***" were found to have for some countries/institutions different and misleading interpretations, so that they were intended as a geological substratum, and not as in the definition given in the INSPIRE technical specifications, where ***soil*** is defined as "the upper part of the earth's crust, formed by mineral particles, organic matter, water, air and living organisms […] the interface between rock, air and water which hosts most of the biosphere, […] subject to a series of threats", and ***subsoil*** is "the natural soil material below the topsoil and overlying the unweathered parent material".

This finding has furtherly evidenced the need for national transpositions of the analysed EU Directives in relations to soil information, possibly inserted inside national integrated legislation for soil protection. **The proper management of soil information needs the official assignment of the role of soil information officers to soil experts**, instead, the officially appointed national environmental officers (officers for generic environmental information), and the INSPIRE contact points/reference institutions rarely coincide with soil experts. This suggests the **need to strengthen the national networks** between the institutions generically responsible for environmental information and for the INSPIRE implementation, and the institutions owning/holding soil information. This lack of networking, together with the lack of defined rules for soil data sharing, can partially explain the low proportion of soil spatial information finally shared in the national and INSPIRE portals by the European public institutions owner/holders of soil information. The technical difficulties in the INSPIRE implementation explain the rest.

The last section of the questionnaire was aimed at investigating on the **soil sharing policies** adopted by the institutions respondents to the questionnaire, therefore, it highlighted on the different practical

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

implementations on this topic as reported from different countries, and from institutions of different nature inside the same country. The sharing policies were investigated for 3 kinds of soil spatial datasets: georeferenced point soil information, soil vector maps (polygons), and soil raster (grid) maps. We investigated on the existence of conditions and limitations to the public access to such a kind of soil information, and on possible incentives for sharing. On the base of the answers received, we were finally able to elaborate a ***draft general agreement for soil data sharing***, which consisted of a list of best suggested practices, and is somehow giving a direction to overcome the lack of a specific transposition of the 2003/4/EC Directive in relation to soil.

The following general rules/best practices, inserted in the draft general agreement (which does not substitute specific agreements for the sharing of specific soil datasets, which are still needed to be defined with the respective data owners) have been defined:

1. The point georeferenced soil data eventually shared among EJP SOIL partners, and towards public institutions external to the EJP SOIL consortium, will not be shared online, if there is not the declared consent from the data owner, which may imply obligatorily for some countries/regions/owners of the EJP SOIL consortium, to get the consent from landowners;
2. The consent for the disclosure of point georeferenced soil data may not be needed only in case of data on emissions into the environment, which disclosure can be denied only if the disclosure adversely affects the international relations, the public security or national defence, the course of justice, the ability of any person to receive a fair trial or the ability of a public authority to conduct an enquiry of a criminal or disciplinary nature, and the intellectual property rights;
3. The soil map data, in whichever format (vector or raster), eventually shared among EJP SOIL partners, and towards public institutions external to the EJP SOIL consortium, can be published online given that in the metadata the sharing rules are declared, such as intellectual property rights or specific licenses, as defined by the respective data owners;
4. The soil map data, in whichever format (vector or raster), eventually shared among EJP SOIL partners, and towards public institutions external to the EJP SOIL consortium, which are shared by their owners under the recognition of an economic payment, could be published in metadata repositories explicitly declaring in the sharing rules the respective fees defined by the owners;
5. A 'bottom-up' approach will be adopted in the soil mapping activities promoted by the EJP SOIL involving the national/regional/federal-state soil data officers/services (official or not), similarly as it is adopted by the pillar 4 of the Global Soil Partnership;
6. The signing of specific mutual agreements for soil data sharing between the EJP SOIL partners and external institutional owners of soil data will be promoted inside each EJP SOIL country.

We hope that the defined rules could become a use case, a procedural antecedent, in the long-term a vision to establish a permanent collaboration in Europe, between public institutions (inside and between European countries), finalized to the delivering of standard, harmonised and authoritative

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

soil mapping and monitoring services, in support of an evidence-based, European wide, environmental-soil policy making, as it was in the intention of the European legislators.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

Introduction

The overall objective of the Work Package 6 of the EJP SOIL is the development of an EU-harmonized soil knowledge base and INSPIRE-compliant EU-integrated soil information system, contributing to the European agricultural and environmental policies and research, to the monitoring of the health status of European soils, and towards an EU-integrated international reporting on agricultural soils.

The present deliverable constitutes a first analysis and a knowledge base on the legal aspects behind the soil data production, storing, management, and sharing inside the EJP SOIL countries, and therefore is a contribution to the achievement of the Expected Impact 4 of EJP SOIL, "Supporting harmonised European soil information, including for international reporting".

The Public Participation in Decision-Making and Access to Justice in Environmental Matters has been signed in 1998 with the Aarhus Convention, as an international legal agreement among 47 Parties coming from Europe and Central Asia, including the 28 EU Member States (EU MS) and the EU itself. In a different perspective, agricultural soils are usually under private property in Europe, therefore the public right to have access to environmental information, must be balanced with the rights of landowners in relation to their properties. Member States are allowed to a certain flexibility in the transposition of EU Directives, given their national legislations. Therefore, the transposition of the European Directive 2003/04/EC 'on public access to environmental information', and of the Directive 2007/2/EC 'on establishing an Infrastructure for Spatial Information in the European Community (INSPIRE)', and their practical implementation in relation to soil data, has taken quite diverse paths in the European countries, even in the Member States ones.

Europe is a very small continent, but very dense of cultural and historical diversity. Europe has 24 official languages, and federal states, even in small countries such as Switzerland or Belgium, are a frequent reality. Consequently, monitoring the state of implementation of European Directives at national and sub-national level is not an easy task, so as it is the reaching of a common ground in the implementation. 27 countries currently belong to the European Union, 20 of which are part of the EJP SOIL consortium. United Kingdom, which was Member State up to 2019 is also partner of EJP SOIL. Then are partners of EJP SOIL Switzerland and Norway, which are 2 of the 4 European Free Trade Association (EFTA) members. Finally, Turkey is inside the EJP SOIL consortium, which is one of the 3 Non-Member States European Countries.

Specific aims of this deliverable were: 1) to have an overview on the state of the implementation in the EJP SOIL countries of the European Directives on the topic of environmental data sharing in relation to soil data, and in particular the Directives 2003/04/EC on public access to environmental information, and Directive 2007/2/EC on establishing an Infrastructure for Spatial Information in the European Community (INSPIRE); 2) to analyse and compare the soil data sharing policies adopted at national/sub-national level, by different soil data owners, and in relation to different types of soil data, in order to get to a minimum common denominator of principles and best practices for soil data sharing among EJP SOIL partners, and in relation to external institutions such as JRC ESDAC and the European Commission; 3) to have a first screen on the national and sub-national soil data holders and

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

owners, their in-between interconnections, their roles and the connections with the institutions responsible for INSPIRE implementation in each EJP SOIL countries. This first analysis will be at the base for the activities which will be undertaken by WP 6 of the EJP SOIL, in collaboration with the WP8 and WP9, to strengthen the national and international networking, with the long-term vision to establish a permanent collaboration.

DISCLAIMER: the legal information released in this deliverable is based on the contribution given by the EJP SOIL partners, partially integrated with legal information retrieved by CREA during the editing phase. The final release of the deliverable has passed through a check and has been approved by EJP SOIL partners. Despite this, with the awareness that the information included could not be complete or not up to date, and that the legal analysis and conclusion released could be misleading for some countries, the deliverable should be considered a good draft base to be used and tuned during the future networking activities which will be promoted by the WP6, which will involve important political actors at national and sub-national level.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

2. Structure and objectives of the deliverable

Since the beginning of the activities of WP6, the aim was to put in place an in depth-analysis of the status quo of the development and implementation of agricultural soil data sharing in the countries involved in the project activities and particularly in the EU MS. The EJP SOIL consortium groups 24 countries, among which 20 are MS, UK was MS up to the 31/01/2020, Norway, and Switzerland are EFTA members, and Turkey is non-MS. This deliverable collects all the feedback gathered, distinguishing them according to the source from where they arose.

The deliverable is structured as follows:
Overview of the regulatory framework at supranational level (par. 2.2):
Literature review and investigation of legal provisions in place (par. 2.3);
Analysis of an ad hoc questionnaire sent to EJP SOIL partners (chapter 3);
Comparative analysis at supranational and national level (chapter 4);
Identification of obstacles and barriers currently in place (chapter 3 and 4);
Elaboration of a draft agreement for soil data sharing among EJP SOIL partners and towards ESDAC (chapter 5);
Conclusions and way forward (chapter 6).

2.1 Methodology

In order to acquire the needed information with respect to the agricultural soil data ownership and sharing, different methodologies were put in place.

The first step was to carry out a **desktop research** in order to find out the already existing information on the topic released by the European Commission and other relevant institutions, by the literature and by European Projects dealing with the same topic or linked topics. This activity facilitated the identification of relevant issues and questions to be asked to the relevant stakeholders, through the EJP SOIL partners. The stakeholders with respect to the agricultural soil data ownership and sharing are either soil data holders and soil data owners, which may or not coincide. Soil data may be held by entities which are not the owner.

The second step was the elaboration of a procedure to get information and feedback by those stakeholders, in order to have a picture of the real situation, in the different contexts and EJP SOIL member countries. A tailored questionnaire (figure 1) was elaborated to acquire relevant information about the status quo of agricultural soil data ownership and sharing. The full version of the questionnaire (Annex 1) was uploaded to be compiled online (https://forms.gle/6G2nw2ww88aH1UPd8) and sent by email to the EJP SOIL partners, who take care of compiling it directly, with the involvement of relevant stakeholders of their countries, or otherwise sent it for compilation directly to those stakeholders.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

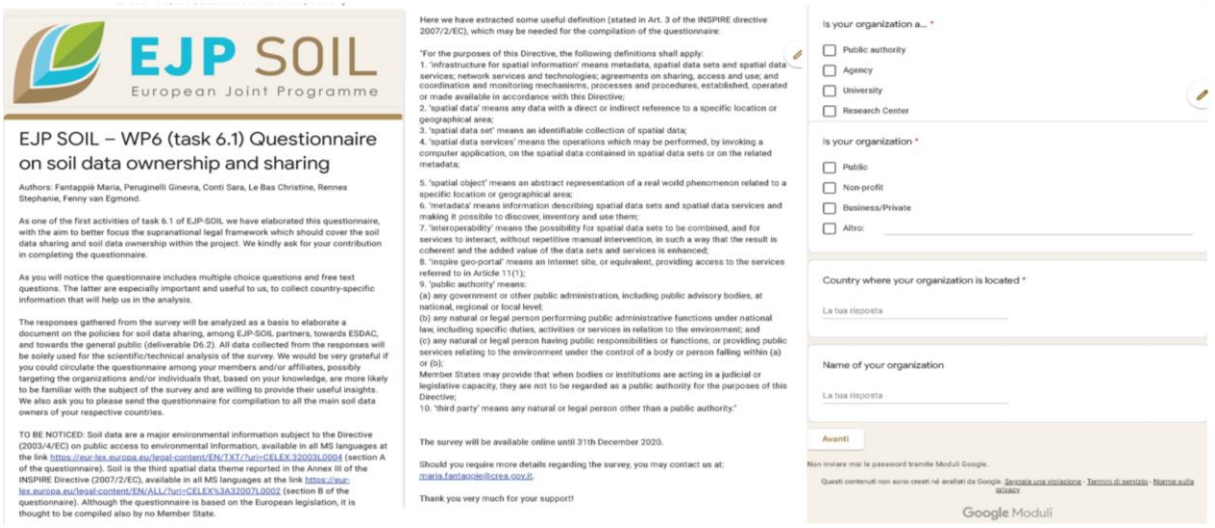

Figure 1 Screenshot of the first page of the questionnaire

The questionnaire was targeted to soil data holders and owners. We considered 4 types of respondent organisations : public authorities, agencies, universities, and research centers. Those organisations could have been either public, or non-profit, or business-private ones.

2.2. Description and analysis of the relevant regulatory framework at European and supranational level (EU provisions on agricultural soil data sharing)

2.2.1 International framework

The Aarhus Convention

The 1998 Aarhus Convention, formally known as the Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters[1], is an international legal agreement among 47 Parties coming from Europe and Central Asia, including the 28 EU Member States and the EU itself (https://treaties.un.org/Pages/ViewDetails.aspx?src=IND&mtdsg_no=XXVII-13&chapter=27&clang=_en). It entered into force in 2001. Its significance lies in the fact that it marks a definitive step forward in the field of environmental governance as it seeks to protect the right of 'every person of present and future generations to live in an environment adequate to his or her health and well-being.' (Article 1, Aarhus Convention). It sets minimum standards empowering members of the public and non-governmental organisations (NGOs) to hold public authorities to account by providing tools to access information, participate in decision-making and obtain redress in matters relating to the environment. For this reason, the Aarhus Convention relates to government accountability, transparency and responsiveness. Issues explored as part of the Convention include

[1] For the text of the Convention in various languages, refer to the United Nations Economic Commission for Europe (UNECE) website: http://www.unece.org/env/pp/treatytext.ht

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

pollutant release and transfer registers, genetically modified organisms, electronic information tools, access to justice and strategic environmental assessment.

The Convention consists of three key elements.

1. Public access to environmental information : public authorities are obliged to share environmental information relevant to their functions, such as the quality of water, air and the atmosphere; land and biological diversity; energy, noise, development plans and policies; and the effects of these on human health, safety and the environment.
2. Public participation in environmental procedures: enables individuals and environmental organisations to participate in environmental decision-making. Public authorities have to inform the public of relevant proposals so that they can submit their comments, which must be taken into consideration.
3. Public access to justice in environmental matters: enables citizens and environmental NGOs to act as "environmental watchdogs" by granting them the right to go to court in cases of failure to apply environmental law.

2.2.2. European Union framework

The three pillars of the Aarhus Convention lie within the areas of authority of the European Union. As such, the EU has been Party to the Convention since 17 February 2005. Its legislation was adapted to the Convention's provisions. The implementation of the Aarhus Convention by the European Community takes the form of two groups of measures:

- Measures that apply to EU bodies and institutions
- Measures taken with regard to EU Member States

Measures that apply to EU bodies and institutions

A draft regulation concerning application of the Convention to institutions and bodies of the European Union was the subject of an agreement between the Council, the Commission and the European Parliament in May 2006. The regulation entered into force on 28 September 2006. According to this regulation, and following the example of the Member States, all European institutions must apply the provisions of the Aarhus Convention on access to information, public participation in decision-making and access to justice regarding the environment. Not only are the Council, Parliament and Commission concerned, but also other institutions (such as the European Investment Bank) or bodies that depend on them (such as the European Environment Agency, European Food Safety Authority, etc.). *In the table 1 are reported the measures taken with regard to EU Member States.*

Table 1 EU regulation for the application of the Aarhus Convention

Pillars of the Aarhus Convention	EU Directives
Access to information	2003/4/EC of 28/01/2003
Public participation	2003/35/EC of 26/05/2003

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

Access to justice	European Commission Directive Proposal COM (2003) 624: withdrawn by the European Commission on the 21st of May 2014

The EU is responsible for developing legally binding policies and directives to ensure compliance with international treaties. There are several EU directives that relate to public access to environmental information, including:

- **Directive 2003/04/EC** on public access to environmental information
- EU Accounts Modernisation Directive 2003 and Transparency Directive 2004
- Directive 2003/98/EC on the re-use of public sector information
- **Directive 2007/2/EC** — Infrastructure for Spatial Information (INSPIRE) aims to promote public access to spatial and infrastructure data that may impact on the environment
- Directive 2010/75/EU on industrial emissions (IED)
- Directive 2014/95/EU on non-financial reporting including the disclosure of policies on environmental, social and other matters by large undertakings and groups
- Directive (EU) 2016/2284 of the European Parliament and of the Council of 14 December 2016 on the reduction of national emissions of certain atmospheric pollutants amending Directive 2003/35/EC for public participation relating to environment plans and programmes
- **Directive 1024/2019/EC** on open data and re-use of public sector information, known as the Open Data Directive

2.2.3 Directive 2003/04/EC on public access to environmental information

The first pillar of the Convention on public access to information has been implemented at European level through Directive 2003/04/EC on public access to environmental information (Access to Information Directive). This Directive grants a general right of access to information to any person, including non-EU citizens, to request environmental information held by or for public authorities and from any public authority within the EU. It aims to ensure that environmental information is made available and disseminated to the public. The directive holds that public authorities should not just be reactive but also proactive in providing this information.

Starting from the belief that as stated in Recital 1 "Increased public access to environmental information and the dissemination of such information contribute to a greater awareness of environmental matters, a free exchange of views, more effective participation by the public in environmental decision-making and, eventually, to a better environment", the Directive establishes in art. 1 the objective to be pursued, that is to guarantee the right of access to environmental information held by public authorities and a wide, systematic and progressive dissemination of this data, allowing Member States to make changes only in melius as provided in the Recital 24 “The provisions of this Directive shall not affect the right of a Member State to maintain or introduce measures providing for broader access to information than required by this Directive”.

This project has received funding from the European Union’s Horizon 2020 research and innovation programme under grant agreement N° 862695

Article 2 Directive 2003/4/EC
Definitions

Environmental information shall mean any information in written, visual, aural, electronic or any other material form on: on the state of elements of the environment such as air, atmosphere, water, land, wetlands, genetically modified organisms etc.; factors such as noise, emissions and discharges etc.; measures such as policies, legislation, environmental agreements and others; reports on the implementation of environmental legislation; cost-benefit and other economic analyses; and, the state of human health and safety, including any effects or consequences of the aforementioned.
A **public authority** is defined as government or other public administration including national, regional and local level bodies; any natural or legal person performing public administrative functions in relation to the environment under national law or having public responsibilities or functions in relation to the environment.
Information held by a public authority means environmental information in its possession which has been produced or received by that authority.
Information held for a public authority means environmental information which is physically held by a natural or legal person on behalf of a public authority.
An **applicant** is the natural or legal person that requests environmental information, while the **public** means one or more legal persons, and in accordance with national legislation or practice, their associations, organizations, or groups.

In line with the Aarhus Convention, the Directive governs 'passive' access to environmental information upon request (art. 3) and 'active' dissemination of environmental information (art. 7).
'Passive' dissemination implies that information officers are designed, which are required to support the public in seeking access to the information, that list of public authorities (holding the different kinds of environmental information) are publicly accessible, that facilities for the examination of the information required are established and maintained, and that registers or lists of the environmental information held by public authorities or information points are established, maintained and made published, with clear indications of where such information can be found. The information actively requested must be made available within two months upon request, therefore, the public authorities shall make all reasonable efforts to **maintain environmental information held by or for them in forms or formats that are readily reproducible and accessible** by computer telecommunications or by other electronic means.
A 'passive' information request may be refused, in line with the Aarhus Convention provisions, if any of the art. 4 '**exceptions**' apply. Some examples of art. 4 'exceptions' to supply environmental information could arise, because the public authority in question does not hold the information requested; the request is too general; or, the request would 'adversely affect' public security or intellectual property rights. However, the grounds for refusal have to be interpreted in a 'restrictive way', requiring a narrow view to be taken of the scope of each exception. Though all exceptions are subject to the 'public interest test', of particular relevance for our purposes is the penultimate closing paragraph of art. 4(2) which provides that, in cases where the information request relates to emissions into the environment, Member States may not apply the following exceptions and are thus required

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

to disclose the relevant information: the confidentiality of the proceedings of public authorities; the confidentiality of commercial or industrial information; the confidentiality of personal data; the interests or the protection of any person who has supplied the requested information on a voluntary basis; or, the protection of the environment to which such information relates.
The information requested shall be free of **charge** (**Article 5**), but public authorities may make a charge for supplying any environmental information but such charge shall not exceed a reasonable amount. **Article 6** concerns **access to justice** in cases where a request for environmental information may have been wrongfully refused, wrongfully ignored, inadequately answered or otherwise not dealt with in accordance with arts 3, 4, and 5 of the Directive.

'Active' dissemination of environmental information requires, *inter alia*, that Member States ensure that "the public authorities make all reasonable efforts to **maintain environmental information held by or for them in forms or formats that are readily reproducible and accessible by computer telecommunications or by other electronic means**.", maintain that information which is relevant to their functions **up to date, accurate and comparable** (Article 8), and make such environmental information 'progressively' available (Article 7) in easily accessible, electronic, public databases. Examples of information that has to be made available includes data or summaries of data derived from monitoring activities and progress reports in the implementation of international treaties and Community environmental law. Thus, the UNFCCC, the Kyoto Protocol and the ET directive, as amended, come under its scope.

Article 3 Directive 2003/4/EC
Access to environmental information upon request

Article 3(1)
Member States shall ensure that public authorities are required, in accordance with the provisions of this Directive, to make available environmental information held by or for them to any applicant at his request and without his having to state an interest.

Article 3(2)
Subject to Article 4 (*on **Exceptions***) and having regard to any timescale specified by the applicant, environmental information shall be made available to an applicant:
(a) as soon as possible or, at the latest, within one month after the receipt by the public authority referred to in paragraph 1 of the applicant's request; or
(b) within two months after the receipt of the request by the public authority if the volume and the complexity of the information is such that the one-month period referred to in (a) cannot be complied with. In such cases, the applicant shall be informed as soon as possible, and in any case before the end of that one-month period, of any such extension and of the reasons for it.

Article 3(3)
If a request is formulated in too general a manner, the public authority shall as soon as possible, and at the latest within the timeframe laid down in paragraph 2(a), ask the applicant to specify the request

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

and shall assist the applicant in doing so, e.g. by providing information on the use of the public registers referred to in paragraph 5(c). The public authorities may, where they deem it appropriate, refuse the request under
Article 4(1)(c).

Article 3(4)
Where an applicant requests a public authority to make environmental information available in a specific form or format (including in the form of copies), the public authority shall make it so available unless:
(a) it is already publicly available in another form or format, in particular under Article 7, which is easily accessible by applicants; or
(b) it is reasonable for the public authority to make it available in another form or format, in which case reasons shall be given for making it available in that form or format.

For the purposes of this paragraph, public authorities shall make all reasonable efforts to **maintain environmental information held by or for them in forms or formats that are readily reproducible and accessible** by computer telecommunications or by other electronic means.

The reasons for a refusal to make information available, in full or in part, in the form or format requested shall be provided to the applicant within the time limit referred to in paragraph 2(a).

Article 3(5)
For the purposes of this Article, Member States shall ensure that:
(a) **officials** are required to support the public in seeking access to information;
(b) **lists of public authorities** are publicly accessible; and
(c) the practical arrangements are defined for ensuring that the right of access to environmental information can be effectively exercised, such as:
— the designation of **information officers**;
— the establishment and maintenance of **facilities for the examination of the information** required,
— **registers or lists of the environmental information** held by public authorities or information points, with clear indications of where such information can be found.

Member States shall ensure that public authorities inform the public adequately of the rights they enjoy as a result of this Directive and to an appropriate extent provide information, guidance and advice to this end.

Article 4 Directive 2003/4/EC
Exceptions

Article 4(1)
Member States may provide for a request for environmental information to be refused if:

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

(a) the information requested **is not held** by or for the public authority to which the request is addressed. In such a case, where that public authority is aware that the information is held by or for another public authority, it shall, as soon as possible, transfer the request to that other authority and inform the applicant accordingly or inform the applicant of the public authority to which it believes it is possible to apply for the information requested;
(b) the **request** is manifestly **unreasonable**;
(c) the request is **formulated in too general** a manner, taking into account Article 3(3);
(d) the request concerns material **in the course of completion** or unfinished documents or data;
(e) the request concerns **internal communications**, taking into account the public interest served by disclosure.

Where a request is refused on the basis that it concerns material in the course of completion, the public authority shall state the name of the authority preparing the material and the estimated time needed for completion.

Article 4(2)
Member States may provide for a request for environmental information to be refused if disclosure of the information would adversely affect:
(a) the **confidentiality** of the proceedings of **public authorities**, where such confidentiality is provided for by law;
(b) international relations, **public security** or **national defence**;
(c) the **course of justice**, the ability of any person to receive a fair trial or the ability of a public authority to conduct an enquiry of a criminal or disciplinary nature;
(d) the **confidentiality of commercial or industrial information** where such confidentiality is provided for by national or Community law to protect a legitimate economic interest, including the public interest in maintaining **statistical confidentiality** and **tax secrecy**;
(e) intellectual property rights;
(f) the **confidentiality of personal data** and/or files relating to a natural person where that person has not consented to the disclosure of the information to the public, where such confidentiality is provided for by national or Community law;
(g) the **interests or protection of any person** who **supplied the information** requested **on a voluntary basis** without being under, or capable of being put under, a legal obligation to do so, unless that person has consented to the release of the information concerned;
(h) the **protection of the environment** to which such information relates, such as the location of rare species.

The grounds for refusal mentioned in paragraphs 1 and 2 shall be interpreted in a restrictive way, taking into account for the particular case the public interest served by disclosure. In every particular case, the public interest served by disclosure shall be weighed against the interest served by the refusal. Member States **may not, by virtue of paragraph 2(a), (d), (f), (g) and (h), provide for a request to be refused where the request relates to information on emissions into the environment**.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

Within this framework, and for the purposes of the application of subparagraph (f), Member States shall ensure that the requirements of Directive 95/46/EC of the European Parliament and of the Council of 24 October 1995 on the protection of individuals with regard to the processing of personal data and on the free movement of such data are complied with (1).

Article 4(3)
Where a Member State provides for exceptions, it may draw up a publicly accessible list of criteria on the basis of which the authority concerned may decide how to handle requests.

Article 4(4)
Environmental information held by or for public authorities which has been requested by an applicant shall be made available in part where it is possible to separate out any information falling within the scope of paragraphs 1(d) and (e) or 2 from the rest of the information requested.

Article 4(5)
A refusal to make available all or part of the information requested shall be notified to the applicant in writing or electronically, if the request was in writing or if the applicant so requests, within the time limits referred to in Article 3(2)(a) or, as the case may be, (b). The notification shall state the reasons for the refusal and include information on the review procedure provided for in accordance with Article 6.

Article 7 Directive 2003/4/EC
Dissemination of environmental information

Article 7(1)
Member States shall take the necessary measures to ensure that public authorities organise the environmental information which is relevant to their functions and which is held by or for them, with a view to its **active and systematic dissemination to the public, in particular by means of computer telecommunication and/or electronic technology**, where available.
The information made available by means of computer telecommunication and/or electronic technology need not **include information collected before the entry into force of this Directive** unless it is already available in electronic form.
Member States shall ensure that environmental information progressively becomes available in electronic databases which are easily accessible to the public through public telecommunication networks.

Article 7(2)
The **information** to be made available and disseminated **shall be updated** as appropriate and shall include at least:
(a) texts of international treaties, conventions or agreements, and of Community, national, regional or local legislation ,on the environment or relating to it;
(b) policies, plans and programmes relating to the environment;

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

(c) progress reports on the implementation of the items referred to in (a) and (b) when prepared or held in electronic form by public authorities;
(d) the reports on the state of the environment referred to in paragraph 3;
(e) data or summaries of data derived from the **monitoring** of activities affecting, or likely to affect, the environment;
(f) authorisations with a significant impact on the environment and environmental agreements or a reference to the place where such information can be requested or found in the framework of Article 3;
(g) **environmental impact studies and risk assessments** concerning the environmental elements referred to in Article 2(1)(a) or a reference to the place where the information can be requested or found in the framework of Article 3.

Article 7(3)
Without prejudice to any specific reporting obligations laid down by Community legislation, Member States shall take the necessary measures to ensure that national, and, where appropriate, regional or local **reports on the state of the environment** are published **at regular intervals not exceeding four years**; such reports shall include information on the quality of, and pressures on, the environment.

Article 8 Directive 2003/4/EC
Quality of environmental information

Article 8(1)
Member States shall, so far as is within their power, ensure that any information that is compiled by them or on their behalf is **up to date, accurate and comparable**.

Article 8(2)
Upon request, public authorities shall reply to requests for information pursuant to Article 2(1)b, reporting to the applicant on the place where information, if available, can be found on the **measurement procedures**, including **methods of analysis, sampling, and pre-treatment of samples**, used in compiling the information, or referring to a **standardised procedure used**.

2.2.4 Directive 2007/2/EC (INSPIRE Directive)

The Infrastructure for Spatial Information in the European Community (INSPIRE) Directive aims to create European Union spatial data infrastructure for EU environmental policies and activities that may have an impact on the environment. The INSPIRE Directive (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 Directive) came into force on 15 May 2007 and it is to be implemented in various stages. Full implementation is expected by 2021.
The Directive places requirements on public bodies that produce, receive, manage or update spatial datasets that cover all of the land and marine areas over which the State has to create such EU-related spatial data infrastructure. This European spatial data infrastructure will enable public sector

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

organisations to share environmental spatial information, to improve public access to spatial information across Europe and to support in policy-making across boundaries.

INSPIRE is based on the infrastructures for spatial information established and operated by EU member states. The Directive has 34 spatial data themes under which datasets are categorised. The themes are grouped into annexes. Each theme has a different deadline by which a dataset must be provided to the EU. Spatial data relates to any direct or indirect reference to specific locations or geographical areas. In the EU such data have been difficult to find online at either a member state (MS) or EU level. The data were often poorly documented and curated in incompatible formats, which made data difficult to use. In addition, no generally available online services were available to enable people to find, access, use and share their spatial data within the country and across borders.

Pan-EU spatial data infra-structure (SDI) of any kind did not exist before the INSPIRE Directive of 2007. The Directive has been designed to address **five identifiable challenges in relation to environmental policies and data**. These challenges include: (1) spatial data that were often missing or incomplete; (2) the absence of metadata description and documentation of the spatial data; (3) the inability to combine spatial datasets; (4) the absence of systems to find, access and use spatial data compatible with other datasets; (5) cultural, institutional, financial and legal barriers that prevented and delayed the sharing and reuse of existing spatial data.

The INSPIRE Directive provides the legal framework to face these challenges. How these challenges are achieved is left to Member States (MS) to decide in terms of the **transposition of the Directive into national laws**.

Each MS in the EU has its own legal structures comprising the laws and administrative divisions. Some of these MS organisational structures have centralised governance while in others the structure may be devolved to municipal government. Legal traditions among MS vary from codified civil law to common law and to other customary rules and regulations. These differences and complexities among various MS have probably led to difficult challenges in attempting to transpose the INSPIRE Directive into MS legislation (Summary Report on Status of implementation of the INSPIRE Directive in EU at http://publications.jrc.ec.europa.eu/repository/bitstream/JRC109035/jrc109035_jrc109035_jrc_inspire_eu_summaryreport_online.pdf

The INSPIRE Directive requires Member States to use common Implementing Rules (IR) in specific areas to ensure spatial data are compatible, usable and can be used seamlessly in cross-border applications. Useful information can be found here: Information for implementers, including a roadmap to full implementation of the Directive

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

SOIL DEFINITION

ANNEX III, 2007/2/EC Directive

Soils and subsoil characterised according to depth, texture, structure and content of particles and organic material, stoniness, erosion, where appropriate mean slope and anticipated water storage capacity.

SOIL, INSPIRE, D2.8.III.3 Data Specification on Soil – Technical Guidelines

For the purpose of the data specification in this document, **soil** is the upper part of the earth's crust, formed by mineral particles, organic matter, water, air and living organisms. It is the interface between rock, air and water which hosts most of the biosphere. Soil is subject to a series of threats as recognized not only in the EU Soil Thematic Strategy (COM(2006)231 final), but indirectly also in several adopted EU Directives (e.g. 1999/31/EC, 91/676/EEC, 86/278/EC..). The requirements of these directives were considered while compiling this data specification.

Based on the definition given by the Directive (2007/2/EC), the scope for the soil theme covers:

a) **Soil inventories**, providing one-off assessments of soil conditions and/or soil properties at certain locations and at a specific point in time, and allow soil monitoring, providing a series of assessments showing how soil conditions and/or properties change over time.

b) **Soil mapping**, providing a spatial presentation of the properties linked to the soils, including soil types; typically, soil maps are derived with the help of data available in soil inventories. Also other soil related information derived from soil properties, possibly in combination with non-soil data are within the scope.

topSoil

Definition	Upper part of a natural soil that is generally dark coloured and has a higher content of organic matter and nutrients when compared to the (mineral) horizons below excluding the humus layer.
Description:	"NOTE 1 For arable lands, topsoil refers to the ploughed soil depth; for grasslands, it is the soil layer with high root content. NOTE 2 The topsoil can be: (i) a grouping of one to several A horizons or (ii) a domain of a soil with a specific vertical extension starting from the surface (e.g. 0-15 cm). NOTE 3 In most soil description guidelines, the topsoil is composed of all A horizons occurring in a soil profile."

subsoil

Definition	Natural soil material below the topsoil and overlying the unweathered parent material.
Description:	SOURCE ISO 11074 NOTE The subsoil can be: (i) a grouping of one to several horizons underlying the horizons with recent humus accumulation from humifying biomass or (ii) a domain of a soil with a specific vertical extension starting well below the soil surface (e.g. 15-75 cm).

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

The table 2 shows the key milestones for INSPIRE implementation

Table 2 Key milestones for INSPIRE implementation

Milestone Date	Description
23 November 2017	Implementation of Commission Regulation (EU) No 1089/2010 of 23 November 2010 , implementing Directive 2007/2/EC of the European Parliament and of the Council. This is about the interoperability of spatial datasets and services for other Annex I spatial datasets still in use at the date of adoption.
04 April 2018	Implementation of Commission Regulation (EU) No 102/2011 of 4 February 2011 amending Regulation (EU) No 1089/2010 implementing Directive 2007/2/EC of the European Parliament and of the Council. This is about the interoperability of spatial datasets and services for other Annex I spatial datasets still in use at the date of adoption.
21 October 2020	Implementation of Commission Regulation (EU) No 102/2011 of 4 February 2011 amending Regulation (EU) No 1089/2010 implementing Directive 2007/2/EC of the European Parliament and of the Council. This is about the interoperability of spatial datasets and services for other Annex I spatial datasets still in use at the date of adoption.
10 December 2021	All relevant spatial data services that shall be conformant with Annexes VI and (where practicable) VII of Commission Regulation (EU) No 1089/2010 as amended by Regulation (EU) No 1312/2014 of 10 December 2014 (...) as regards interoperability of spatial data services.

Please note that, at the time this report is written, the Directive INSPIRE is under evaluation. A public consultation was held from April 19 to July, 12, 2021. At the end of 2021, the European Commission will issue a report on the relevance, effectiveness, efficiency, coherence of the INSPIRE Directive: "*In particular, it will look at how the current legal framework fulfils the objectives of data sharing between the public authorities and making data publicly accessible in a user-friendly manner*".

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

2.2.5 Directive 1024/2019/EC on open data and re-use of public sector information, known as the Open Data Directive

The European Commission's Directive 1024/2019/EC *on open data and re-use of public sector information*, known as the ***Open Data Directive***, came into force in July 2019 (https://eur-lex.europa.eu/eli/dir/2019/1024/oj), which amends the Directive 2003/98/EC (*on the re-use of public sector information*) The Directive encourages the EU's Member States to make as much information available for re-use as possible. It covers data held in the public sector by bodies such as ministries, state agencies and municipalities, as well as organizations funded mostly by or under the control of public authorities. Member States have to implement the Directive into national law by July 2021. As regards the implementation into national law, EU countries have to transpose Directive (EU) 2019/1024 by 16 July 2021. At the moment of writing the Deliverable, only the following EU countries adopted national transposition measures: Denmark, Greece, Lithuania and France.

Directive 1024/2019/EC
Selected recitals

Recital 4

The substantive changes introduced to the legal text so as to fully exploit the potential of public sector information for the European economy and society **should focus on the following areas**: the provision of real- time access to **dynamic data** via adequate technical means, the increase of the supply of **valuable public data** for re-use, including from public undertakings, research performing organisations and research funding organisations, the tackling of the emergence of new forms of exclusive arrangements, the use of exceptions to the principle of charging the marginal cost and the relationship between this Directive and certain related legal instruments, including Regulation (EU) 2016/679 of the European Parliament and of the Council (5) and Directives 96/9/EC (6), 2003/4/EC (7) and 2007/2/EC (8) of the European Parliament and of the Council.

Recital 16

Open data as a concept is generally understood to denote ***data in an open format that can be freely used, re-used and shared by anyone for any purpose***. ***Open data policies*** *which encourage the wide availability and re-use of public sector information for private or commercial purposes, with minimal or no legal, technical or financial constraints*, and which promote the circulation of information not only for economic operators but primarily for the public, can play an important role in promoting social engagement, and kick-start and promote the development of new services based on novel ways to combine and make use of such information. **Member States are therefore encouraged to promote** the creation of data based on the **principle of 'open by design and by default'**, with regard to all documents falling within the scope of this Directive. In doing so they should ensure a consistent level of protection of public interest objectives, such as public security, including where sensitive critical infrastructure protection related information are concerned. They should also ensure the protection of personal data, including where information in an individual data set does not present a risk of

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

identifying or singling out a natural person, but when that information is combined with other available information, it could entail such a risk.

Recital 17

Moreover, without minimum **harmonisation at Union level**, legislative activity at national level, which has already been initiated in a number of Member States in order to respond to the technological challenges, might result in even more significant divergence. The impact of such legislative divergence and uncertainties will become more significant with the further development of the information society, which has already greatly increased cross- border exploitation of information.

Recital 23

This Directive does not restrict or impair the performance of the statutory tasks of public authorities and other public sector bodies. This Directive lays down an obligation for Member States to make all existing documents re- usable unless access is restricted or excluded under national rules on access to documents or subject to the other exceptions laid down in this Directive. **This Directive builds on the existing access regimes in the Member States and does not change the national rules for access to documents.** It does not apply to cases in which citizens or legal entities can, under the relevant access regime, obtain a document only if they can prove a particular interest. At Union level, Article 41 on the right to good administration and Article 42 on the right of access to documents in the Charter recognise the right of any citizen of the Union and any natural or legal person residing or having its registered office in a Member State to have access to documents held by the European Parliament, the Council and the Commission. Public sector bodies should be encouraged to make available for re-use any documents held by them. Public sector bodies should promote and encourage re-use of documents, including official texts of a legislative and administrative nature in those cases where the public sector body has the right to authorise their re-use.

Recital 27

The volume of **research data** generated is growing exponentially and has potential for re-use beyond the scientific community. In order to be able to address mounting societal challenges efficiently and in a holistic manner, it has become crucial and urgent to be able to access, blend and re-use data from different sources, as well as across sectors and disciplines. Research data includes statistics, results of experiments, measurements, observations resulting from fieldwork, survey results, interview recordings and images. It also includes meta-data, specifications and other digital objects. Research data is different from scientific articles reporting and commenting on findings resulting from their scientific research. For many years, the **open availability and re-usability of scientific research data stemming from public funding** has been subject to specific policy initiatives. Open access is understood as the practice of providing online access to research outputs free of charge for the end user and without restrictions on use and re-use beyond the possibility to require acknowledgement of authorship. Open access policies aim in particular to provide researchers and the public at large with access to research data as early as possible in the dissemination process and to facilitate its use and re-use. **Open access helps enhance quality, reduce the need for unnecessary duplication of research, speed up scientific progress, combat scientific fraud, and it can overall favour economic growth and**

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

innovation. *Beside open access, commendable efforts are being made to ensure that data management planning becomes a standard scientific practice and to support the dissemination of research data that are findable, accessible, interoperable and re-usable (the FAIR principle).*

Recital 28

For the reasons explained above, **it is appropriate to set an obligation on Member States to adopt open access policies with respect to publicly funded research data and ensure that such policies are implemented by all research performing organisations and research funding organisations**. Research performing organisations and research funding organisations could also be organised as public sector bodies or public undertakings. This Directive applies to such hybrid organisations only in their capacity as research performing organisations and to their research data. Open access policies typically allow for a range of **exceptions** from making scientific research results openly available. The Commission Recommendation of 25 April 2018 on access to and preservation of scientific information describes, among other things, relevant elements of open access policies. Additionally, the conditions, under which certain research data can be re-used, should be improved. For that reason, certain obligations stemming from this Directive should be extended to research data resulting from scientific research activities subsidised by public funding or co-funded by public and private-sector entities. **Under the national open access policies, publicly funded research data should be made open as the default option**. *However, in this context, concerns in relation to **privacy**, **protection of personal data**, **confidentiality**, **national security**, **legitimate commercial interests**, such as trade secrets, and to **intellectual property rights of third parties** should be duly taken into account, according to the principle* '**as open as possible, as closed as necessary**'. Moreover, research data which are excluded from access on grounds of national security, defence or public security should not be covered by this Directive. *In order to avoid any administrative burden, obligations stemming from this Directive **should apply only to such research data that have already been made publicly available by researchers, research performing organisations or research funding organisations** through an institutional or subject-based repository and should not impose extra costs for the retrieval of the datasets or require additional curation of data.* Member States may extend the application of this Directive to research data made publicly available through other data infrastructures than repositories, through open access publications, as an attached file to an article, a data paper or a paper in a data journal. Documents other than research data should continue to be exempt from the scope of this Directive.

Recital 31

[…] **Reasonable time limits** throughout the Union will stimulate the creation of new aggregated information products and services at pan-Union level. This is particularly important for **dynamic data** (including environmental, traffic, satellite, meteorological and sensor generated data), the economic value of which depends on the immediate availability of the information and of regular updates. Dynamic data ***should therefore be made available immediately after collection***, or in the case of a manual update immediately after the modification of the dataset, ***via an application programming interface (API)*** so as to facilitate the development of internet, mobile and cloud applications based on such data. Where this is not possible due to technical or financial constraints, public sector bodies should make the documents available in a timeframe that allows their full economic potential to be

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

exploited. Specific measures should be taken in order to lift relevant technical and financial constraints. Should a licence be used, the timely availability of documents may be a part of the terms of the licence. Where data verification is essential in the light of justified public interest reasons, in particular for public health and safety, dynamic data should be made available immediately after verification. Such essential verification should not affect the frequency of the updates.

Recital 50

Arrangements between data holders and data re-users which do not expressly grant exclusive rights but which can reasonably be expected to restrict the availability of documents for re-use **should be subject to additional public scrutiny**. The essential aspects of such arrangements should therefore be published online at least two months before coming into effect, namely two months before the agreed date on which the performance of the 26.6.2019 L 172/64 Official Journal of the European Union obligations of the parties is set to begin. The publication should give interested parties an opportunity to request the re-use of the documents covered by those arrangements and prevent the risk of restricting the range of potential re-users. In any event, the essential aspects of such arrangements in their final form agreed by the parties should also be made public online without undue delay following their conclusion.

Recital 52

This Directive does not affect the protection of individuals with regard to the processing of personal data under Union and national law, particularly Regulation (EU) 2016/679 and Directive 2002/58/EC of the European Parliament and of the Council (18) and including any supplementing provisions of national law. This means, inter alia, that the re-use of personal data is permissible only if the principle of purpose limitation as set out in point (b) of Article 5(1) and Article 6 of Regulation (EU) 2016/679 is met. ***Anonymous information*** is information which does not relate to an identified or identifiable natural person or to personal data rendered anonymous in such a manner that the data subject is not or is no longer identifiable. **Rendering information anonymous** *is a means of reconciling the interests in making public sector information as re-usable as possible with the obligations under data protection law*, but it comes at a cost. It is appropriate to consider that cost to be one of the cost items to be considered to be part of the marginal cost of dissemination as referred to in this Directive.

Recital 54

The intellectual property rights of third parties are not affected by this Directive. For the avoidance of doubt, the term 'intellectual property rights' refers to copyright and related rights only, including sui generis forms of protection. This Directive does not apply to documents covered by industrial property rights, such as patents and registered designs and trade marks. **The Directive neither affects the existence or ownership of intellectual property rights of public sector bodies**, nor does it limit the exercise of these rights in any way beyond the boundaries set by this Directive. The obligations imposed in accordance with this Directive should apply only insofar as they are compatible with international agreements on the protection of intellectual property rights, in particular the Berne Convention for the Protection of Literary and Artistic Works (Berne Convention), the Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS Agreement) and the WIPO Copyright

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

Treaty (WCT). **Public sector bodies should, however, exercise their copyright in a way that facilitates re-use**.

Recital 66

In order to provide for conditions supporting the re-use of documents which is associated with important socioeconomic benefits having a particular high value for the economy and society, a list of **thematic categories of high-value datasets** should be set out in an Annex. By way of illustration, and without prejudice to the implementing acts identifying the high-value datasets to which the specific requirements set out in this Directive should apply, taking into account the Commission guidelines on recommended standard licences, datasets and charging for the reuse of documents, the thematic categories could, inter alia, cover postcodes, national and local maps (geospatial), energy consumption and satellite images (earth observation and environment), in situ data from instruments and weather forecasts (meteorological), demographic and economic indicators (statistics), business registers and registration identifiers (companies and company ownership), road signs and inland waterways (mobility).

Recital 68

An Union-wide list of datasets with a particular potential to generate socioeconomic benefits together with harmonised re-use conditions constitutes an important enabler of cross-border data applications and services. In order to ensure uniform conditions for the implementation of this Directive, **implementing powers should be conferred on the Commission** to support the re-use of documents associated with important socioeconomic benefits by **adopting a list of specific high-value datasets to which specific requirements of this Directive apply**, along with the arrangements for their publication and re-use. Consequently, **those specific requirements will not apply prior to the adoption by the Commission of implementing acts**. […]

Recital 69

For the purpose of ensuring their maximum impact and to facilitate re-use, **the high-value datasets should be made available for re-use with minimal legal restrictions and free of charge**. They should also be published **via APIs**. However, this does not preclude public sector bodies from charging for services that they provide in relation to the high-value datasets in their exercise of public authority, in particular certifying the authenticity or veracity of documents.

Recital 71

This Directive respects the fundamental rights and observes the principles recognised in particular by the Charter, including **the right to privacy**, **the protection of personal data**, **the right to property** and **the integration of persons with disabilities**. Nothing in this Directive should be interpreted or implemented in a manner that is inconsistent with the Council of Europe Convention for the Protection of Human Rights and Fundamental Freedoms.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

Article 2 Directive 1024/2019/EC
Definitions

For the purpose of this Directive, the following definitions apply:
(1) 'public sector body' means the State, regional or local authorities, bodies governed by public law or associations formed by one or more such authorities or one or more such bodies governed by public law;
(2) '**bodies governed by public law**' means bodies that have all of the following characteristics: (a) they are established for the specific purpose of meeting needs in the general interest, not having an industrial or commercial character; (b) they have legal personality; and (c) they are financed, for the most part by the State, regional or local authorities, or by other bodies governed by public law; or are subject to management supervision by those authorities or bodies; or have an administrative, managerial or supervisory board, more than half of whose members are appointed by the State, regional or local authorities, or by other bodies governed by public law;
(3) '**public undertaking**' means any undertaking active in the areas set out in point (b) of Article 1(1) over which the public sector bodies may exercise directly or indirectly a dominant influence by virtue of their ownership of it, their financial participation therein, or the rules which govern it. A dominant influence on the part of the public sector bodies shall be presumed in any of the following cases in which those bodies, directly or indirectly: (a) hold the majority of the undertaking's subscribed capital; (b) control the majority of the votes attaching to shares issued by the undertaking; (c) can appoint more than half of the undertaking's administrative, management or supervisory body;
(4) '**university**' means any public sector body that provides post-secondary-school higher education leading to academic degrees;
(5) '**standard licence**' means a set of predefined re-use conditions in a digital format, preferably compatible with standardised public licences available online;
(6) '**document**' means: (a) any content whatever its medium (paper or electronic form or as a sound, visual or audiovisual recording); or (b) any part of such content;
(7) '**anonymisation**' means the process of changing documents into anonymous documents which do not relate to an identified or identifiable natural person, or the process of rendering personal data anonymous in such a manner that the data subject is not or no longer identifiable;
(8) '**dynamic data**' means documents in a digital form, subject to frequent or real-time updates, in particular because of their volatility or rapid obsolescence; data generated by sensors are typically considered to be dynamic data;
(9) '**research data**' means documents in a digital form, other than scientific publications, which are collected or produced in the course of scientific research activities and are used as evidence in the research process, or are commonly accepted in the research community as necessary to validate research findings and results;
(10) '**high-value datasets**' means documents the re-use of which is associated with important benefits for society, the environment and the economy, in particular because of their suitability for the creation of value-added services, applications and new, high-quality and decent jobs, and of the number of potential beneficiaries of the value-added services and applications based on those datasets;

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

(11) '**re-use**' means the use by persons or legal entities of documents held by: (a) public sector bodies, for commercial or non-commercial purposes other than the initial purpose within the public task for which the documents were produced, except for the exchange of documents between public sector bodies purely in pursuit of their public tasks; or (b) public undertakings, for commercial or non-commercial purposes other than for the initial purpose of providing services in the general interest for which the documents were produced, except for the exchange of documents between public undertakings and public sector bodies purely in pursuit of the public tasks of public sector bodies;
(12) '**personal data**' means personal data as defined in point (1) of Article 4 of Regulation (EU) 2016/679; (extract from Regulation (EU) 2016/679: '**personal data**' means any information relating to an identified or identifiable natural person ('data subject'); an identifiable natural person is one who can be identified, directly or indirectly, in particular by reference to an identifier such as a name, an identification number, location data, an online identifier or to one or more factors specific to the physical, physiological, genetic, mental, economic, cultural or social identity of that natural person ;
(13) '**machine-readable format**' means a file format structured so that software applications can easily identify, recognise and extract specific data, including individual statements of fact, and their internal structure;
(14) '**open format**' means a file format that is platform-independent and made available to the public without any restriction that impedes the re-use of documents;
(15) '**formal open standard**' means a standard which has been laid down in written form, detailing specifications for the requirements on how to ensure software interoperability;
(16) '**reasonable return on investment**' means a percentage of the overall charge, in addition to that needed to recover the eligible costs, not exceeding 5 percentage points above the fixed interest rate of the ECB; (17) 'third party' means any natural or legal person other than a public sector body or a public undertaking that holds the data.

Article 2 Directive 1024/2019/EC
ANNEX I

List of **thematic categories of high-value datasets**, as referred to in Article 13(1)

1. Geospatial
2. Earth observation and environment
3. Meteorological
4. Statistics
5. Companies and company ownership
6. Mobility

This directive was intended to further promote **Open data policies in Member States**, "*which encourage the wide availability and re-use of public sector information for private or commercial purposes, with minimal or no legal, technical or financial constraints […]*

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

*Member States are therefore encouraged to promote the creation of data based on the principle of **'open by design and by default'**, with regard to all documents falling within the scope of this Directive*". But it is also clearly reaffirmed that "*In doing so they (Member States) should ensure a consistent level of **protection of public interest objectives**, such as public security, including where sensitive critical infrastructure protection related information are concerned. They should also ensure the **protection of personal data**, including where information in an individual data set does not present a risk of identifying or singling out a natural person, but when that information is combined with other available information, it could entail such a risk*." In fact, in other recitals, it is also clearly stated that the Directive 1024/2019/EC "*lays down an obligation for Member States to make all existing documents re- usable unless access is restricted or excluded under national rules on access to documents or subject to the other exceptions laid down in this Directive. This Directive **builds on the existing access regimes in the Member States and does not change the national rules for access to documents***." […], "***does not affect the protection of individuals with regard to the processing of personal data under Union and national law**, particularly Regulation (EU) 2016/679 and Directive 2002/58/EC of the European Parliament and of the Council (18) and including any supplementing provisions of national law*", and […] "***The intellectual property rights of third parties are not affected** by this Directive. […]The Directive neither affects the existence or ownership of intellectual property rights of public sector bodies. [...] Public sector bodies should, however, exercise their copyright in a way that facilitates re-use.*"

We underline here some mayor changes in comparison to previous Directives which are linked to the Directive 1024/2019/EC. The Directive 1024/2019/EC defines differentiated rules for the re-use of certain categories of data, namely the i) publicly funded research data; ii) the 'dynamic data', and the 'high value data set'. In relation to the **publicly funded research data**, the Directive states that "*it is appropriate to set an obligation on Member States to adopt open access policies (e.g. FAIR principles) with respect to publicly funded research data and ensure that such policies are implemented by all research performing organisations and research funding organisations*." Therefore "**Under the national open access policies, publicly funded research data should be made open as the default option**." Given this, also in case of research data, the data protection rules are reaffirmed, therefore, it is stated that "*concerns in relation to **privacy, protection of personal data, confidentiality, national security, legitimate commercial interests**, such as trade secrets, and to **intellectual property rights of third parties** should be duly taken into account, according to the principle* '**as open as possible, as closed as necessary**'. […], and the directive do not necessarily apply to research data produced before the entering in force of the Directive, which are not already available "*through an institutional or subject-based repository and should not impose extra costs for the retrieval of the datasets or require additional curation of data."*

In relation to the '**dynamic data**', which are defined as "documents in a digital form, subject to frequent or real-time updates, in particular because of their volatility or rapid obsolescence; data generated by sensors are typically considered to be dynamic data.", and which economic value "depends on the immediate availability of the information and of regular updates.", the Directive states that they "***should be made available immediately after collection***, or in the case of a manual update immediately after the modification of the dataset, ***via an application programming interface (API)*** so as to facilitate the development of internet, mobile and cloud applications based on such data."

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

Finally, particular attention is paid to the re-use of the so-called '**High value data set'**, to be understood as data whose reuse is linked to important benefits for society, the environment and the economy, which have significant commercial potential and can accelerate the development of information products and added value services (this includes, for example, geospatial, meteorological, statistical, mobility data, etc.).

The Directive identifies six thematic categories of high-value datasets, which include geospatial, Earth observation & environment, meteorological and statistics, and postpones the definition and adoption of a list of specific high-value datasets by the adoption of an implementing act by the Commission, which is foreseen in the 4th quarter of 2021, following an impact assessment which will include:

- Identifying in every Member State specific datasets that should belong to the list of high-value datasets.
- Analyzing the possible impacts of making the high-value datasets available for re-use free of charge on public sector bodies and public undertakings and the markets in which they operate.

For the purpose of ensuring their maximum impact and to facilitate re-use, **the high-value datasets should be made available for re-use with minimal legal restrictions and free of charge**. They should also be published **via APIs**.

2.2.6 Conclusions on European Framework

In conclusion, the Aarhus Convention and the EU Directives constitute solid foundations in the creation of the so-called "environmental democracy", understood as the right of individuals and groups to know, participate and influence decisions on environmental matters. They also support the application of knowledge-based policies and monitoring of activities that have an environmental impact. They set out actions to remove obstacles to the sharing of spatial data between all levels of government within and across Member States (Szpor, 2017).

2.3 Literature review and projects on the topic

Before the questionnaire, the team has carried out a preliminary analysis on legal literature, projects and initiatives relevant for the topic.
A specific focus on legal literature has been considered to focus on the legal framework at European level. The attention of legal publication is dedicated not specifically on soil data but in general on environmental data. Furthermore, many are the publications dealing with the European legal framework and implementation of the different Directives across countries.

In particular the table 3 shows a selection of the most recent legal publications (articles, book chapters) on the matter.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

Table 3 Selection of relevant recent publications

Bibliographic references	Abstract
Cho, G., Crompvoets, J., 2019. *The INSPIRE directive: some observations on the legal framework and implementation*, Survey Review, 51:367, 310-317, https://doi.org/10.1080/00396265.2018.1454686	The observation that spatial and environmental data relating to specific locations or geographic areas in the European Union (EU) have been difficult to find online is undisputed. Whether the EU INSPIRE Directive of 2007 which establishes an infrastructure to enable the sharing of spatial data and services to support European and national environmental policies will achieve its objectives is a topic of debate. The INSPIRE Directive was conceived and implemented to address identifiable challenges relating to environmental policies and data. Before the complete implementation of the Directive, it may be necessary to reflect on what progress has been achieved at a legal and policy level. The central argument of this paper is that legal and policy issues may have hindered the rapid and smooth implementation of the Directive. The implementation of the legal framework of the Directive provides salutary lessons. Evaluation reports from the European Commission and the four case studies demonstrably paint an encouraging future. The conclusion is that INSPIRE should foster good governance, use and sharing of environmental data and information for the common good of all Europeans
Cetl, V., Tomas, R., Kotsev, A., de Lima, V.N., Smith, R.S., Jobst, M., 2019. *Establishing Common Ground Through INSPIRE: The Legally-Driven European Spatial Data Infrastructure*. In: Döllner, J., Jobst, M., Schmitz, P. (eds) Service-Oriented Mapping. Lecture Notes in Geoinformation and Cartography. Springer, Cham. https://doi.org/10.1007/978-3-319-72434-8_3	Back in the 1990s, there were several barriers for accessing and using the spatial data and information necessary for environmental management and policy making in Europe. These included different data policies, encodings, formats and semantics, to name a few. Data was collected for, and applied to, domain specific use cases and comprehensive standards did not exist, all impacting on the re-usability of such public sector data. To release the potential of spatial data held by public authorities and improve evidence-based environmental policy

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

	making, action was needed at all levels (Local, Regional, National, European) to introduce more effective data and information management and to make data available for citizens' interest. The INSPIRE Directive, the Infrastructure for Spatial Information in Europe, directly addresses this set of problems. The Directive came into force on 15 May 2007, with full implementation in every EU Member State required by 2021. It combines both a legal and a technical framework for the EU Member States, to make relevant spatial data accessible and reused. Specifically, this has meant making data discoverable and interoperable through a common set of standards, data models and Internet services. The Directive's data scope covers 34 themes of cross-sector relevance as a decentralised infrastructure where data remains at the place it can be best maintained. A great deal of experience has been gained by public administrations through its implementation. Due to its complexity and wide scope, this is taking place in a stepwise manner, with benefits already emerging as important deadlines approached. Efficient and effective coordination are following the participatory approach established in its design. It is timely to reflect on 10 years of progress of the "cultural change" which the European Spatial Data Infrastructure represents. We therefore, consider the lessons INSPIRE is offering for those interested in joined-up and federated approaches to geospatial data-sharing and semantic interoperability across borders and sectors. The approach itself is evolving through this experience.
Szpor, G., 2017. T*he Dilemmas of implementing the Inspire Directive.* In: Conference Proceedings: Geographic Information Systems Conference and Exhibition (GIS ODYSSEY), Trento, 4 September 2017, pp. 379-384 http://www.gis.us.edu.pl/index.php?option=com_mtree&task=att_download&link_id=766&cf_id=24	The aim of this article is to show diverse patterns of the INSPIRE directive (2007) transposition and to point at the best practices in its implementation among the EU-member states so far. For that reason, different coordination structures and data sharing policies are analysed. Based on the analysis, several dilemmas in relation to Spatial Information

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

	Infrastructure are presented: the openness versus security of data, free of charge or paid access, creation and maintenance model, finally, public versus private subjects' participation. Ten years after the directive's adoption, the integration of regulations seems to be the main success, yet presented dilemmas need still to be readdressed.
Cetl, V., de Lima, V.N., Tomas, R., Lutz, M., D'Eugenio, J., Nagy, A., Robbrecht, J., 2017. *Summary Report on Status of implementation of the INSPIRE Directive in EU*, EUR 28930 EN, Publications Office of the European Union, Luxembourg, 2017, ISBN 978-92-79-77058-6, JRC109035. https://doi.org/10.2760/143502	The INSPIRE Directive sets the minimum conditions for interoperable sharing and exchange of spatial data across Europe as part of a larger European Interoperability Framework and the e-Government Action Plan that contributes to the Digital Single Market Agenda. Article 21 of INSPIRE Directive defines the basic principles for monitoring and reporting. More detailed implementing rules regarding INSPIRE monitoring and reporting have been adopted as COMMISSION DECISION regarding INSPIRE monitoring and reporting on the 5th of June 2009. Summary Report on Status of implementation of the INSPIRE Directive in EU has been prepared to highlight the overall implementation performance across Member States. The report combines the findings of the specific country fiches which have been based on: • the 2016 tri-annual INSPIRE implementation reports and action plans for future development • the 2016 monitoring reports • bilateral meetings on the implementation of the INSPIRE Directive between the Commission and most of the Member States. It shows the progress in relation to the INSPIRE mid-term report4 and the REFIT evaluation5 which referred to the situation in 2013-14. The monitoring reports submitted by the Member States in May 2017 show further progress in some countries and areas.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

Besides the abstracts, we report some other useful citations of the reported publications.

Szpor (2017) summarises the contents of the 3 annexes of the INSPIRE Directive as follow : "Annex I contains basic data themes, e.g. coordinate reference systems, addresses, cadastral parcels and transport networks; Annex II has geographic data themes, e.g. elevation and land cover; Annex III covers environmental, health and energy data themes e.g. monitoring facilities, industrial, agricultural or aquaculture facilities, natural risk zones, habitats or energy resources".

Cetl et al. (2017) pointed out that "in some cases INSPIRE implementation was setup purely from a national mapping and cadastral agencies perspective, resulting in a strong focus on Annex I and II data sets and showing gaps on the availability of Annex III data sets and the coordination with the environmental domain".

Szpor (2017) summarises very well the steps to be followed in the INSPIRE implementation:
(1) set up coordination structures and adopt and implement legal measures to remove procedural obstacles to the sharing of spatial data ;
(2) identify their spatial data relevant to environmental policies and policies and actions with an environmental impact according to themes listed in the annexes of the Directive ;
(3) document the spatial data so that they can be accessed on the Internet together with information on aspects such as their source, geographical coverage, quality and conditions of use, in line with the metadata specifications ;
(4) implement interoperable online services allowing the discovery, visualisation and download of spatial data ;
(5) gradually organise and publish the spatial data according to common data models for greater interoperability and improved productivity.

It is clear that the first step (to set up coordination structures) is determinant in the effective achievement of the INSPIRE implementation. Cetl et al. (2017) summarised as follow the situation at the 2016: "Member States have installed a coordination structure and governance for their INSPIRE implementation. 21 Member States show a positive trend in ensuring an effective coordination. In some cases the coordination is not effective enough and needs to be improved or changed. The coordination structure reflects the administrative culture and the constitutional setup of the Member State (federated vs centralized, involvement of local authorities …)".

Szpor (2017) listed the following dilemmas to which decide on by Member States when implementing the INSPIRE Directive :

1. Dividing tasks between multiple entities means that it is important what entity is the national coordinator and whether it has legal instruments that enable effective coordination. In some EU Member States, e-Government activity, opening of data for re-use and modernizing of spatial information infrastructure are the tasks that compete for the budget. Combining those tasks under the responsibility of one minister increases the chances that they will be compatible and not competitive tasks.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

2. The second dilemma relates to the model of financing of Spatial Information Infrastructure. Different EU Member States have different scope of data sharing services. Charging fees for downloading spatial data is a rule that lays down exceptions in the public interest. Under an unstable external supply, such a model should be considered to be beneficial, provided that the exceptions are duly regulated.
3. The third dilemma of the regulation is openness versus security. The over-average broad range of online access to electronic public records has resulted in downloading entire sets of data, e.g., land and mortgage registers, by anonymous entities who were using the data in a manner that may collide with the security requirements of the state and its citizens.
4. The fourth dilemma of the regulation is the division of roles of creating and maintaining the information infrastructure between public and private entities. Increasingly more frequent cyber-attacks require, among others, to change the situation of public and private entities in telecommunications and to re-consider the relation between them in terms of offering and using spatial data, in relation to: a) public security, including the development of emergency notification systems; b) investment activities of enterprises and investments in telecommunication networks c) current activity of technical network construction and business activity of entrepreneurs in telecommunication.

A review of relevant projects has already been done in the EJP SOIL deliverable D6.1 (Report on harmonized procedures for creation of databases and maps), paragraph 1.1.1 (Procedures for creating soil databases and exchanging soil data), and ANNEX 1. The following relevant projects were identified: ENVASSO[2], GS Soil[3], SIEUSOIL[4], CIRCASA[5], ENVRI-FAIR [6].

Summarizing the literature and project review, it is clear that the full implementation of the INSPIRE directive in relation to environmental data and in particular in relation to soil, still needs to pass through several steps, and to overcame several barriers :

1) the coordination of the different actors involved, with the definition of coordinating institution and clear rules for the several actors, and with the fully involvement of all the data holders and owners ;
2) the definition of data sharing arrangements between public authorities and towards the Community institutions and bodies, and the reporting of actions and best practices taken to overcome the existing sharing barriers ;
3) the definition of data sharing arrangements in relation to specific environmental data and in particular for soil data which could preserve either the private and the public interests ;
4) the definition of the financial maintenance of the infrastructure, including first of all, the costs for the permanent recruitment of specialized expert personnel, and for the capacity building for this personnel ;

[2] https://esdac.jrc.ec.europa.eu/projects/envasso
[3] https://www.eurogeosurveys.org/projects/gssoil/
[4] https://www.sieusoil.eu/newsletter-3/#1596610924468-29c0a5d7-2dc9
[5] https://www.circasa-project.eu/
[6] https://www.circasa-project.eu/

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

5) the contemporarily definition of a common (English) technical language for each environmental data theme, in order to effectively publish and share environmental data in the multilingual European reality.

2.4 Questionnaire concept, structure, and type of respondent by country

The questionnaire was drafted with the contribution of both legal and technical experts of the CNR, CREA, INRAE, and WR Institutions, and included the following 7 sections :

a) general information on the respondent
b) soil data ownership, with reference to the Directive (2003/4/EC) on public access to environmental information
b) adoption/transposition of the INSPIRE Directive (2007/2/EC)
c) metadata, with reference to the INSPIRE Directive (2007/2/EC)
d) interoperability of spatial data sets and services, with reference to the INSPIRE Directive (2007/2/EC)
e) network services, with reference to the INSPIRE Directive (2007/2/EC)
f) conditions/limitations and incentives for soil data sharing, with reference to the INSPIRE Directive (2007/2/EC)

The aim of the questionnaire was to acquire directly from participating countries the information on the national/sub-national/local implementation of the Directive (2003/4/EC) and of the INSPIRE Directive (2007/2/EC). In particular, the questionnaire was focused on the adaptation to national legislations, the gaps in the implementation, common “policies” adopted in the implementation, the barriers faced, and the needed action forward related to the implementation, with a specific attention on soil data.

The questionnaire included multiple choice questions and free text questions. The latter have been especially important and useful to collect country-specific information. Depending on the context of the question it may also be expected from the participant to upload a document (a link to).This has supported the present analysis on soil data sharing and ownership.

The full version of the questionnaire (Annex 1) was uploaded to be compiled online (https://forms.gle/6G2nw2ww88aH1UPd8) and sent by email to the EJP SOIL partners.

All data collected from the responses has been solely used for the scientific/technical analysis of the survey and for the draft of this deliverable.

The user can use the ‘Previous’, or ‘Next’ buttons to move between subpages. The user can submit the survey only at the end of the survey. The administrators of the platform can access the so-called ‘admin page’ which provides reporting and exporting capabilities: listing all submitted questionnaires; reviewing submitted questionnaires per user (email address) or per question; providing basic statistics on questionnaires (answers frequencies); exporting all data.

This project has received funding from the European Union’s Horizon 2020 research and innovation programme under grant agreement N° 862695

The questionnaire was compiled, between 25/11/2020 and the 05/03/2021, by at least one respondent in 22 of the 24 countries belonging to the EJP SOIL consortium (figure 2). We received 3 answers from Latvia and 3 answers from Italy. No responds were provided by Denmark and Estonia. Of the 22 responding countries, the following 3 were not MS in the period of implementation of the studied EU directive: Norway, Switzerland, and Turkey. The UK was MS up to 31/01/2020. Finland and Hungary gave partial answers. Slovenia answered after two months after the deadline for submission.

For 5 countries the answers were given by the research centers partners of the EJP SOIL: Slovenia (AIS), Poland (IUNG), Lithuania (LAMMC), Finland (LUKE), and Netherlands (WR). For Sweden (SLU), and Czech Republic (CZU) the answers were given by EJP SOIL partners which are universities. For the UK the answers were given by a group of research centers: the Agri-Food and Biosciences Institute (AFBI), which is the EJP SOIL partner, the UK Centre for Ecology and Hydrology (CEH), and the James Hutton Institute.

For 4 countries the answers were given by EJP SOIL partners which are both public authorities and research centers : Germany (Thuenen), Hungary (MTA ATK), Spain (CSIC+INIA), and Slovakia (NPPC). For Norway the answers were given by the EJP SOIL partner NIBIO, which is either a public authority, an agency, and a research center. For Turkey and Belgium, the answers were given by the EJP SOIL partner which are public authorities: TAGEM (Ministry of Agriculture and Forestry of Turkey General Directorate of Agricultural Research and Policies), for Turkey, and VPO (Flemish Planning Bureau for the Environment and Spatial Development) for Belgium. It is worthy to make note that no answers have been received from the EJP SOIL partner from Wallonia Region of Belgium, therefore the answers received for Belgium could be not representative of the Wallonian situation. The EJP SOIL partners from Switzerland and Portugal preferred to leave the compilation to their respective public authorities: the Swiss Federal Office for the Environment and the Direção-Geral de Agricultura e Desenvolvimento Rural (DGADR). The questionnaire was compiled by the EJP SOIL partner Teagasc for Ireland, which is both a research center and an agency.

France and Austria produced a common compilation. For France the compilation was done by public authorities, and research centers members of "GIS SOL" (www.gissol.fr), a group devoted to coordinate the soil mapping and monitoring activities for France. for France. For Austria the questionnaire was answered by several organizations both Public authorities and agencies belonging to BIOS.

For Italy the answers were given separately but in coordination by CREA (with the contribution of ISPRA), ERSAF, and by the Consorzio Lamma. CREA and ISPRA are research centers partners of EJP SOIL. ERSAF is a regional agency of Lombardy (Italy) and is an EJP SOIL partner. Consorzio Lamma is a consortium between the regional administration of Tuscany (Italy), therefore a public authority, and a research center.

For Latvia the answers were given separately but in coordination by the University of Latvia (UL), EJP SOIL partner, the State Plant Protection Service, a public authority, and the Ministry of Agriculture Real Estate, a state limited company.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

For these 2 countries, different answers were counted on the basis of the majority of responses. In any case, the divergence of the answers was specified for each question.

The results that are reported in the chapter 3 and their analysis offer the current status of soil data sharing across all the EJP SOIL countries that have been asked to fill in the questionnaire created for the purpose of this deliverable.

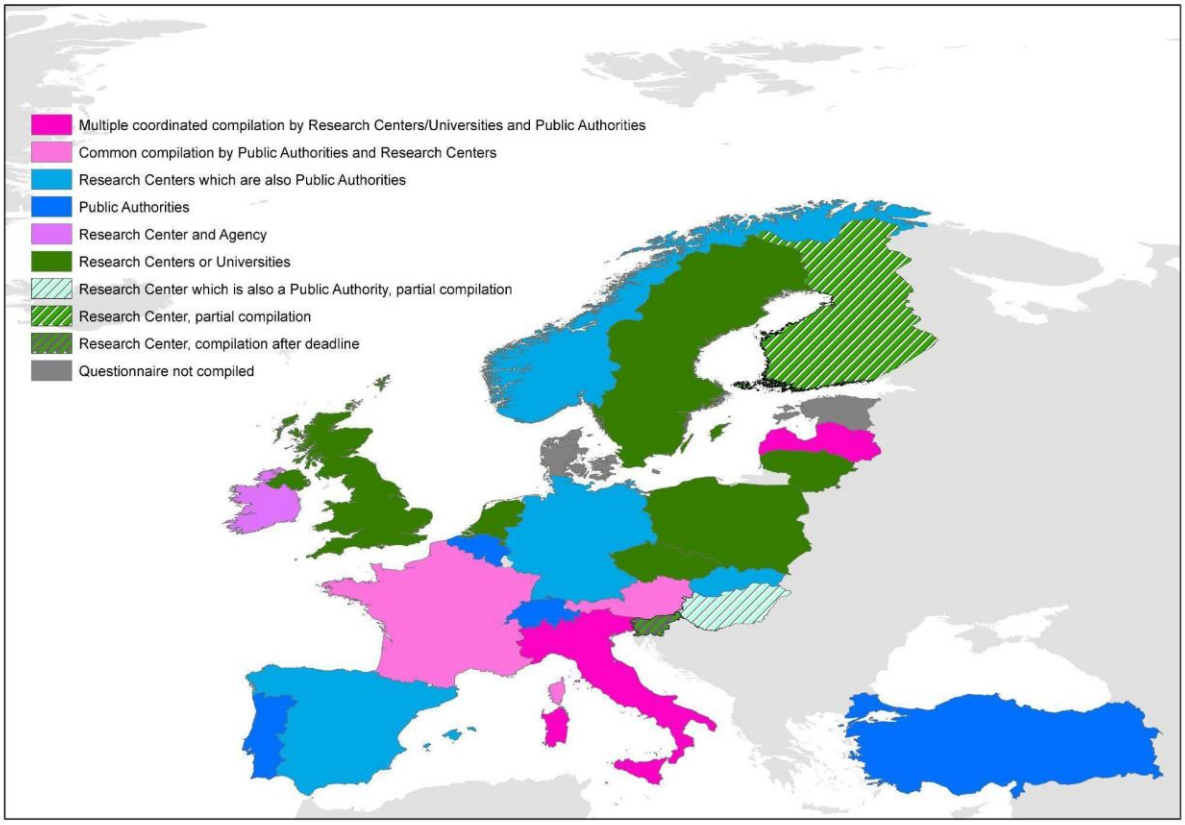

Figure 2 Soil data ownership and sharing questionnaire compilation by EJP SOIL countries.

3. Analysis of the Questionnaire Results

3.1 SOIL DATA OWNERSHIP (Section A)

The Section aims at offering a glance on the state of the art on the soil data ownership, with particular focus on sovranational legislation on access to public data. The respondents were asked to answer on the implementation of the Directive 2003/4/CE.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

According to recital 1 of the cited Directive the *increased public access to environmental information and the dissemination of such information contribute to a greater awareness of environmental matters, a free exchange of views, more effective participation by the public in environmental decision-making and, eventually, to a better environment*. In particular, article 2 let. a) of the Directive clarifies that for the purposes of Directive itself "Environmental information shall mean any information in written, visual, aural, electronic or any other material form on the state of the elements of the environment, such as, among others, soil".

In relation to the first slot of questions (**Q1**, **Q2**, **Q3** and **Q4**), they aim at investigating the status quo of the transposition of the Directive 2003/4/CE across the 24 EJP SOIL countries (20 of which are European Member States), in general and specifically for soil data.

Q1. Has your State transposed the Directive (2003/4/EC) on public access to environmental information into national law? If yes to the question 1, please list the specific references.

Q2. Has your State transposed the Directive (2003/4/EC) specifically in relation to soil information? If yes to the question 2, please list the specific references.

Q3. Is an official English version of the national legislation transposing the Directive (2003/4/EC) available? If yes to the question 3, please list the specific references.

Q4. Which laws, regulations and administrative provisions have been brought into force by your State to comply with the Directive (2003/4/EC), as foreseen in the article 10? Please list the specific references.

As regards **Q1** It is worth to note that the majority of the EJP SOIL countries have implemented the Directive (figure 3). 18 EJP SOIL countries (of which 16 MS, plus Norway, and UK), declared they have transposed the Directive. The national transposition can be found at the following link : https://eur-lex.europa.eu/legal-content/EN/NIM/?uri=celex:32003L0004. Therefore, we verified that also Denmark and Estonia have transposed the directive. Norway, although it is not a MS, has transposed the Directive. Sweden, Turkey, Spain, and Switzerland declared they have not. Among these 4, Spain, and Sweden are MS. Retrieving it from the EU link, we have found that the Spanish transposition do exist, and instead it is confirmed that a Swedish transposition is missing. Turkey and Switzerland, as they are not MS, are not supposed to adopt EU regulations. Despite that, Switzerland declared specific provisions out of the context of the Directive. More specifically Switzerland adopted the Aarhus Convention (https://www.bafu.admin.ch/bafu/de/home/themen/recht/fachinformationen/aarhus-konvention.html) on the federal level. Adoption of the Aarhus Convention up to the cantonal level is ongoing.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

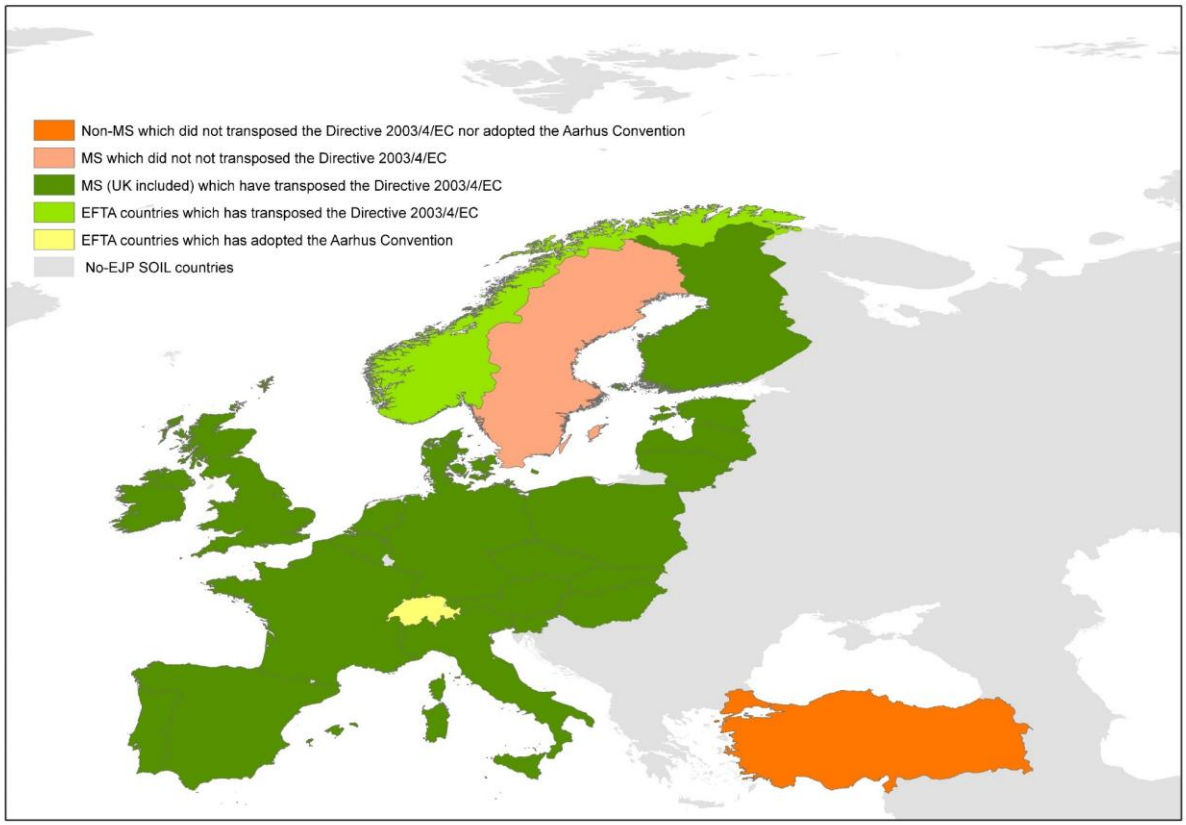

Figure 3 Transposition of the Directive 2003/4/EC in the EJP SOIL countries

In the table 4 are reported the national transpositions, as reported by the EJP SOIL respondents to the questionnaire, integrated if necessary by information retrieved in the official eu-link: https://eur-lex.europa.eu/legal-content/EN/NIM/?uri=celex:32003L0004.

Table 4 References and links to the online versions of the national implementing laws of the Directive 2003/4/CE on Public Access to Environmental Information

State	References and links to online versions
AT	Consolidated federal law: Entire legal regulation for the Environmental Information Act, version dated June 23, 2021, https://www.ris.bka.gv.at/GeltendeFassung.wxe?Abfrage=Bundesnormen&Gesetzesnummer=10010766; https://www.umweltbundesamt.at/umweltinformation/rechtliche-grundlagen.
BE-FL	Decree of the Flemish Government of 28 October 2005 on the dissemination of environmental information, https://www.ejustice.just.fgov.be/mopdf/2005/11/30_1.pdf#Page206, https://www.ejustice.just.fgov.be/img_l/pdf/2005/10/28/2005036461_N.pdf; Ordinance of 18 March 2004 on access to information relating to the environment in the Brussels-Capital Region, https://www.etaamb.be/fr/ordonnance-du-18-mars-

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

	2004_n2004031137.html; Decree of March 16, 2006 modifying Book I of the Environmental Code with regard to the public's right of access to environmental information, https://www.etaamb.be/fr/decret-du-16-mars-2006_n2006201234.html; Law on Public Access to Environmental Information, https://www.ejustice.just.fgov.be/mopdf/2006/08/28_1.pdf#Page6. On open data, https://overheid.vlaanderen.be/organisatie/informatiemanagement/omzetting-psi-richtlijn
CZ	Act No 123/1998 on the right to information on the environment, https://www.zakonyprolidi.cz/cs/1998-123; Act No 83/2015 amending Act No 123/1998 on the right to information on the environment, as amended, https://aplikace.mvcr.cz/sbirka-zakonu/ViewFile.aspx?type=z&id=28807
DE	Federal Environmental Information Act, https://www.bmu.de/fileadmin/Daten_BMU/Download_PDF/Strategien_Bilanzen_Gesetze/umweltinformationsgesetz_en_bf.pdf; Environmental Information Act, Umweltinformationsgesetz (UIG) 27. Oktober 2014 http://www.gesetze-im-internet.de/uig_2005/index.html; Bavarian Environmental Information Act, Bayerisches Umweltinformationsgesetz (BayUIG) 8. Dezember 2006 https://www.gesetze-bayern.de/Content/Document/BayUIG-8; Law on Access to Environmental Information, Gesetz über den Zugang zu Umweltinformationen vom 7. März 2006 (GBl. S. 50), Article 1 of the Act on Access to Environmental Information contains the State Environmental Information Act, Artikel 1 des Gesetzes über den Zugang zu Umweltinformationen enthält das Landesumweltinformationsgesetz (LUIG) https://ec.europa.eu/environment/aarhus/pdf/reports/germany.pdf; Berlin Freedom of Information Act of December 19, 2005; Environmental Information Act of the State of Brandenburg, Berliner Informationsfreiheitsgesetz vom 19. Dezember 2005; Umweltinformationsgesetz des Landes Brandenburg (BbgUIG) vom 26. März 2007, https://bravors.brandenburg.de/gesetze/bbguig_2007/2; Environmental Information Act for the State of Bremen, Umweltinformationsgesetz für das Land Bremen (BremUIG) vom 15. November 2005 https://www.transparenz.bremen.de/sixcms/detail.php?gsid=bremen2014_tp.c.70196.de&asl=bremen203_tpgesetz.c.55340.de&template=20_gp_ifg_meta_detail_d; Hamburg Environmental Information Act, Hamburgisches Umweltinformationsgesetz (HmbUIG) vom 4. November 2005 http://www.landesrecht-hamburg.de/jportal/portal/page/bshaprod.psml;jsessionid=3E86B44DC71ECDB22DA63FEC93D2F4B7.jp22?showdoccase=1&st=lr&doc.id=jlr-UIGHArahmen&doc.part=X&doc.origin=bs; Hessian Environmental Information Act, Hessisches Umweltinformationsgesetz (HUIG) vom 14. Dezember 2006 https://www.rv.hessenrecht.hessen.de/bshe/document/jlr-UIGHErahmen; State Environmental Information Act, Landes-Umweltinformationsgesetz (LUIG M-V) vom 14. Juli 2006 http://www.umweltinformationsrecht.de/media/content/files/LUIG_MV.pdf; Lower Saxony Environmental Information Act, Niedersächsisches

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

	Umweltinformationsgesetz (NUIG) vom 7. Dezember 2006 http://www.nds-voris.de/jportal/?quelle=jlink&query=UIG+ND&psml=bsvorisprod.psml&max=true&aiz=true#jlr-UIGNDrahmen; Environmental Information Act of North Rhine-Westphalia, Umweltinformationsgesetz Nordrhein-Westfalen (UIG NRW) vom 29. März 2007 https://recht.nrw.de/lmi/owa/br_text_anzeigen?v_id=10000000000000000633; State Environmental Information Act, Landesumweltinformationsgesetz (LUIG) vom 19. Oktober 2005 http://www.umweltinformationsrecht.de/media/content/files/RLPf_LUIG.pdf; Saarland Environmental Information Act, Saarländisches Umweltinformationsgesetz (SUIG) vom 12. September 2007 https://recht.saarland.de/bssl/document/jlr-UmwInfGSLrahmen; Saxon Environmental Information Act, Sächsisches Umweltinformationsgesetz (SächsUIG) vom 1. Juni 2006 https://www.revosax.sachsen.de/vorschrift/1471-Saechsisches-Umweltinformationsgesetz; Environmental Information Act of the State of Saxony-Anhalt, Umweltinformationsgesetz des Landes Sachsen-Anhalt (UIG LSA) vom 14. Februar 2006 https://www.landesrecht.sachsen-anhalt.de/bsst/document/jlr-UIGSTrahmen; Environmental Information Act for the State of Schleswig-Holstein, Umweltinformationsgesetz für das Land Schleswig-Holstein (UIG-SH) vom 2. März 2007 https://beck-online.beck.de/Dokument?vpath=bibdata%2Fges%2Fshuig%2Fcont%2Fshuig.htm&anchor=Y-100-G-SHUIG; Thüringer Umweltinformationsgesetz, Thüringer Umweltinformationsgesetz (ThürUIG) vom 10. Oktober 2006
DK	Act amending the Act on Access to Environmental Information, Lov om ændring af lov om aktindsigt i miljøoplysninger of 02/05/2005, https://www.retsinformation.dk/eli/lta/2005/310; Order on the active dissemination of environmental information, Bekendtgørelse om aktiv formidling af miljøoplysninger of 13/05/2005, https://www.retsinformation.dk/eli/accn/B20050041505; Order on payment for access to environmental information not provided on paper within the Ministry of the Environment, Bekendtgørelse om betaling for aktindsigt i miljøoplysninger, der ikke udleveres på papir, indenfor Miljøministeriets område, of 28/09/2005, https://www.retsinformation.dk/eli/accn/B20060143105; Order No 1519 of 7 December 2016 on environmental monitoring, Bekendtgørelse nr. 1519 af 7. december 2016 om miljøtilsyn, of 07/12/2016, https://www.retsinformation.dk/eli/lta/2016/1519; Order of the Act on Access to Environmental Information (Consolidation Act No 102 of 26/01/2017), Bekendtgørelse af lov om aktindsigt i miljøoplysninger (LBK nr 102 af 26/01/2017), https://www.retsinformation.dk/eli/lta/2017/980.
EE	Environmental Register Act, Keskkonnaregistri seadus, RTI, 10.07.2002, 58, 361, https://www.riigiteataja.ee/akt/113032019082; Environmental Impact Assessment and Environmental Management System Act, Keskkonnamõju hindamise ja keskkonnajuhtimissüsteemi seadus, RTI, 22.02.2005, 15, 87, https://www.riigiteataja.ee/akt/116112010013; Detailed procedure for keeping the environmental register, Keskkonnaregistri pidamise täpsustatud kord, RTL, 25.01.2005, 14, 129, https://www.riigiteataja.ee/akt/839591; Act implementing the General Part of

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

	the Environmental Code Act, Keskkonnaseadustiku üldosa seaduse rakendamise seadus, RTI, 08.07.2014, 3, https://www.riigiteataja.ee/akt/108072014003.
ES	Law 27/2006 of 18 July regulating the rights of access to information, public participation and access to justice in environmental matters (incorporating Directives 2003/4/EC and 2003/35/EC), https://www.boe.es/buscar/doc.php?id=BOE-A-2006-13010; Order PRE/1597/2014 of 5 September 2007 establishing the amounts and laying down rules on the management and collection of the fee for the provision of environmental information in the context of the General State Administration and its Public Bodies, https://www.boe.es/buscar/doc.php?id=BOE-A-2014-9188.
FI	15.06.2012/355, Act amending Section 2 of the Act on Access to Information, Public Participation and the Right to Appeal and Initiate in Environmental Matters, https://www.finlex.fi/fi/laki/alkup/2012/20120355; 13.8.2004/768, Act on the redemption permit for certain projects affecting the use of the environment, https://finlex.fi/fi/laki/ajantasa/2004/20040768; 30.6.2000/738, Act Amending the Nuclear Energy Act, https://finlex.fi/fi/laki/alkup/2000/20000738; Government's proposal to Parliament on the adoption of the Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters and its legislation in the field of legislation the entry into force of the provisions of this Regulation certain projects affecting the use of the environment processing in the redemption procedure and the Nuclear Energy Act amending, https://www.eduskunta.fi/FI/vaski/HallituksenEsitys/Documents/he_165+2003.pdf.
FR	*LOI n° 78-753 du 17 juillet 1978, v. init.*, Law No 78-753 of 17 July 1978, as amended, laying down various measures to improve relations between the administration and the public and various administrative, social and fiscal provisions. Consolidated version as at 24 March 2006, https://www.legifrance.gouv.fr/loda/id/JORFTEXT000000339241/ ; *Loi n° 2005-1319 du 26 octobre 2005*, v. init., Law No 2005-1319 of 26/10/2005 laying down various provisions adapting to Community law in the field of the environment, , https://www.legifrance.gouv.fr/loda/id/JORFTEXT000000635725/; *Décret n°2005-1755 du 30 décembre 2005*, v. init., Decree No 2005-1755 of 30 December 2005 on freedom of access to administrative documents and the re-use of public information, adopted for the implementation of Law No 78-753 of 17 July 1978, https://www.legifrance.gouv.fr/loda/id/JORFTEXT000000265304/; *Décret n°2006-578 du 22 mai 2006*, v. init., Decree No. 2006-578 of May 22, 2006 relating to information and public participation in environmental matters, amending the Environmental Code and Decree No. 77-1133 of September 21, 1977 relating to classified installations for the protection of the environment, https://www.legifrance.gouv.fr/loda/id/JORFTEXT000000609999/; *Arrêté du 31 janvier 2008, v. init.*, Order of 31 January 2008 relating to the register and annual declaration of polluting emissions and waste, https://www.legifrance.gouv.fr/jorf/id/JORFTEXT000018276495.
HU	Act LXXXI of 2001 promulgating the Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters, adopted

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

	in Aarhus on 25 June 1998, https://net.jogtar.hu/jogszabaly?docid=a0100081.tv; The Government DOC. 311/2005. (XII. 25.) Government Decree No/ Decree public access to environmental information on the order of access, https://net.jogtar.hu/jogszabaly?docid=A0500311.KOR; Act LIII of 1995 on the general rules of environmental protection, https://net.jogtar.hu/jogszabaly?docid=99500053.tv.
IE	S.I. No. 133/2007 - European Communities (Access to Information on the Environment) Regulations 2007, http://www.irishstatutebook.ie/eli/2007/si/133/made/en/print; S.I. No. 662/2011 - European Communities (Access to Information on the Environment) (Amendment) Regulations 2011, http://www.irishstatutebook.ie/eli/2011/si/662/made/en/print; S.I. No. 615/2014 - European Communities (Access to Information on the Environment) (Amendment) Regulations 2014, http://www.irishstatutebook.ie/eli/2014/si/615/made/en/print; S.I. No. 309/2018 - European Communities (Access to Information on the Environment) (Amendment) Regulations 2018, http://www.irishstatutebook.ie/eli/2018/si/309/made/en/print.
IT	Implementation of Directive 2003/4/EC on public access to environmental information, DECRETO LEGISLATIVO 19 agosto 2005, n. 195 https://www.gazzettaufficiale.it/eli/id/2005/10/13/05A09687/s
LT	Regarding the approval of the description of the procedure for providing environmental information to the public in the Republic of Lithuania, LR Vyriausybės nutarimas, Valstybės žinios, 1999, Nr. 90-2660, https://e-seimas.lrs.lt/portal/legalAct/lt/TAD/TAIS.88827/asr?positionInSearchResults=38&searchModelUUID=d948f059-ca54-4125-bfef-383ff18cf6ea. Regarding the Government of the Republic of Lithuania October 22 Resolution no. 1175 "On the Amendment to the Procedure for Providing Environmental Information to the Public in the Republic of Lithuania", Resolution of the Government of the Republic of Lithuania, State of knowledge, 2005-02-24, Nr. 26-831, https://e-seimas.lrs.lt/portal/legalAct/lt/TAD/TAIS.250678
LV	Freedom of Information Law (29.10.1998, with amendments to the law by 22.09.2015)https://likumi.lv/ta/en/en/id/50601-freedom-of-information-law, https://likumi.lv/ta/id/50601-informacijas-atklatibas-likums; Geospatial Information Law (17.12.2009., with amendments to the law by 30.05.2018.)https://likumi.lv/ta/en/id/202999-geospatial-information-law, https://likumi.lv/ta/id/202999-geotelpiskas-informacijas-likums; Environmental Protection Law (2.11.2006, with amendments to the law by 22.06.2020.)https://likumi.lv/ta/en/en/id/147917-environmental-protection-law; Land Management Law (30,10,2014. with amendments to the law by 28.11.2019.) https://likumi.lv/ta/en/en/id/60460-land-register-law; Republic of Latvia Cabinet Regulation No. 158. Regulations Regarding the Requirements with Respect to Environmental Monitoring and the Procedures for Performance Thereof, the Creation of the Register of Polluting Substances and Public Availability of Information (17 February 2009) https://likumi.lv/ta/en/en/id/188150 Republic of Latvia Cabinet Regulation No. 833 Procedures by which the Information Regarding the Fertility Level of the Agricultural

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

	Land and the Changes Thereof is Obtained and Compiled (5 October 2004) http://extwprlegs1.fao.org/docs/pdf/lat190873ENG.pdf
NL	Law on public access to the administration (Wet openbaarheid van bestuur). https://wetten.overheid.nl/BWBR0005252/2018-07-28
NO	Environment Information Act: https://lovdata.no/dokument/NL/lov/2003-05-09-31?q=milj%C3%B8informasjonsloven
PL	Dz.U. 2008 Nr 199 poz. 1227. Act of 3 October 2008 on the provision of information on the environment and its protection, public participation in environmental protection and on environmental impact assessment. http://isap.sejm.gov.pl/isap.nsf/DocDetails.xsp?id=WDU20081991227
PT	Decreto-Lei n. 180/2009 modified by the Decreto-Lei n. 84/2015 https://dre.pt/application/conteudo/494010, https://dre.pt/application/conteudo/69968702 (Diretiva 2007/2/CE); Decreto-Lei n. 214-G/2015 https://dre.pt/application/conteudo/70423756 modifying the Lei n. 46/2007 (Diretiva 2003/98/CE); the Lei n. 19/2006 (Diretiva 2003/4/CE), revoked by the Lei n. 26/2016, de 22 de agosto https://dre.pt/application/conteudo/75177807
SI	Law on environmental protection, http://www2.gov.si/zak/Zak_vel.nsf/d7deb4e66512c8a1c1256616002db332/c12563a400338836c1257109002decac?OpenDocument&ExpandSection=1 ; Freedom of Information Act, http://pisrs.si/Pis.web/pregledPredpisa?id=ZAKO3336; Act ratifying the Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters, https://www.uradni-list.si/_pdf/2004/Ur/u2004062.pdf; Act amending the Environmental Protection Act, http://www.pisrs.si/Pis.web/pregledPredpisa?sop=2016-01-1264.
SK	Act No 211/2000 on freedom of access to information and amending certain acts (Freedom of Information Act) https://www.slov-lex.sk/pravne-predpisy/SK/ZZ/2000/211/ Act no. 205/2004 Coll. on the collection, storage and dissemination of information on the environment and on the amendment of certain laws https://www.slov-lex.sk/pravne-predpisy/SK/ZZ/2004/205/20191227; In March 2004, Act no. 205/2004 Coll. on the collection, storage and dissemination of information on the environment and on the amendment of certain laws. This law entered into force on 1 July 2004.
UK	For England, Wales and Northern Ireland: Environmental Information Regulations 3391 of 2004, https://www.legislation.gov.uk/uksi/2004/3391/contents/made; For Scotland: Environmental Information (Scotland) Regulations 520 of 2004, https://www.legislation.gov.uk/ssi/2004/520/contents/made.

The question **Q2** was devoted to specify whether the transposition of the Directive 2003/4/EU has been realized in relation to soil data. The results showed that few countries opted for a positive answer (the 38.5%, as reported in the figure 3). It is worthy to mention that Sweden, which answered negatively to the previous question, specifically declared to have implemented the Directive 2003/4/EU in relation to soil data. The references given by Sweden for this transposition, cite the INSPIRE directive, and although they do not directly cite the 2003/4/EC, they treat the geographical

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

environmental information, and therefore share some contents with the 2003/4/EC. France opted for a positive answer, but specified that soil information is addressed inside the laws related to environmental information. Similarly, Latvia, UK, Ireland answered positively but gave the same references as for Q1. Finland gave further references in relation to environmental data, but none of them was specific for soil, and only one refers explicitly to soil. Hungary did not give any specific reference. Netherlands gave a specific transposition in relation to subsoil, where subsoil is defined as "solid part of the earth with the liquids and gases contained therein, including the hollow spaces present therein". The use of the term subsoil, in this Dutch law is intended as "substratum" for mining activities, and not as "subsoil" in the pedological meaning. We can therefore evidence here that none of the EJP SOIL countries has a transposition of the Directive 2003/4/EC specifically for soil. The references to the transpositional laws given by the respondents are reported in the table 5.

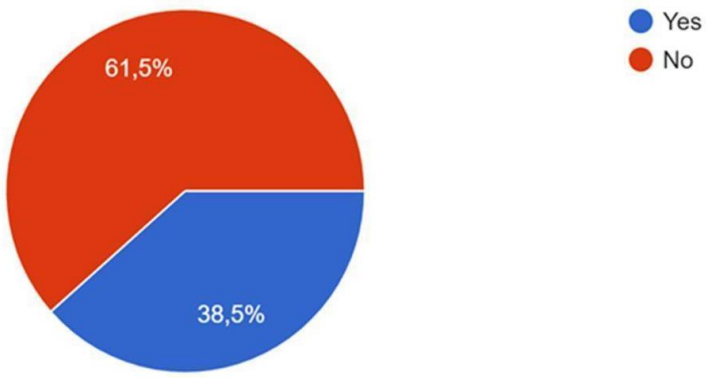

Figure 4 Percentage of the respondent to the questionnaire which declared a transposition of the Directive (2003/4/EC) in relation to soil data

Table 5 References and links to the online versions of the national implementing laws of the Directive 2003/4/CE on Public Access to Environmental Information in relation to soil data

State	References and links to online versions
FI	The Government's proposal to Parliament to amend the Act on the Finnish Forest Centre's Forest Information System, https://finlex.fi/fi/esitykset/he/2017/20170170?search%5Bpika%5D=kumoamisesta&search%5Btype%5D=pika; Government's proposal to Parliament for legislation amending certain provisions concerning public announcements in the administrative sector of the Ministry of the Environment, https://finlex.fi/fi/esitykset/he/2019/20190073; The Government's proposal to Parliament on the Food Administration Information Reserve and related laws, https://www.finlex.fi/fi/esitykset/he/2020/20200262; The Government's proposal to Parliament to amend the Ministry of Agriculture and Forestry's administrative information disclosure regulations, https://www.finlex.fi/fi/esitykset/he/2020/20200133.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

FR	Soil information is addressed among other environmental information: *Loi n° 2005-1319 du 26 octobre 2005, v. init.*, Law No 2005-1319 of 26/10/2005 laying down various provisions adapting to Community law in the field of the environment, https://www.legifrance.gouv.fr/loda/id/JORFTEXT000000635725; Environmental Code, Chapter IV: Right of access to information relating to the environment (Articles L124-1 to L124-8), https://www.legifrance.gouv.fr/codes/id/LEGISCTA000006159212.
IE	S.I. No. 133/2007 - European Communities (Access to Information on the Environment) Regulations 2007, http://www.irishstatutebook.ie/eli/2007/si/133/made/en/print; S.I. No. 662/2011 - European Communities (Access to Information on the Environment) (Amendment) Regulations 2011, http://www.irishstatutebook.ie/eli/2011/si/662/made/en/print; S.I. No. 615/2014 - European Communities (Access to Information on the Environment) (Amendment) Regulations 2014, http://www.irishstatutebook.ie/eli/2014/si/615/made/en/print; S.I. No. 309/2018 - European Communities (Access to Information on the Environment) (Amendment) Regulations 2018, http://www.irishstatutebook.ie/eli/2018/si/309/made/en/print.
LV	Environmental Protection Law (2.11.2006, with amendments to the law by 22.06.2020.) https://likumi.lv/ta/en/en/id/147917-environmental-protection-law; Land Management Law (30,10,2014. with amendments to the law by 28.11.2019.) https://likumi.lv/ta/en/en/id/60460-land-register-law; Republic of Latvia Cabinet Regulation No. 158. Regulations Regarding the Requirements with Respect to Environmental Monitoring and the Procedures for Performance Thereof, the Creation of the Register of Polluting Substances and Public Availability of Information (17 February 2009) https://likumi.lv/ta/en/en/id/188150.
NL	Act of September 30, 2015, containing rules regarding the basic registration subsoil (Basic Registration Subsoil Act), https://wetten.overheid.nl/BWBR0037095/2019-04-24.
SE	Act (2010: 1767) on geographical environmental information, Lag (2010:1767) om geografisk miljöinformation, 2010-12-03, https://www.riksdagen.se/sv/dokument-lagar/dokument/svensk-forfattningssamling/lag-20101767-om-geografisk-miljoinformation_sfs-2010-1767; Ordinance (2010: 1770) on geographical environmental information, 2010-12-03, Förordning (2010:1770) om geografisk miljöinformation, 2010-12-03, https://www.riksdagen.se/sv/dokument-lagar/dokument/svensk-forfattningssamling/forordning-20101770-om-geografisk_sfs-2010-1770.
UK	Environmental Information Regulations 3391 of 2004, https://www.legislation.gov.uk/uksi/2004/3391/contents/made.

The question **Q3** aimed at verifying whether an English version of the transposition laws was available. Only 4 countries (the 26.9%, figure 5) gave a positive answer to this question: Latvia, Lithuania, and obviously UK and Ireland. Latvia gives all the laws either in the Latvian and in the English version. For Norway the English version of the transposition is available, although the answer was negative.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

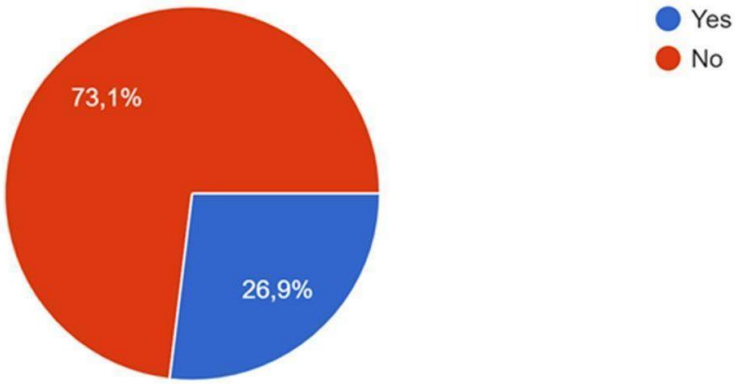

Figure 5 Percentage of the respondent to the questionnaire which declared the availability of an English version of the national transposition of the Directive (2003/4/EC)

The countries which opted for a positive answer to **Q3**, were requested to give pertinent references to the English version of the transpositional laws. The table 6 reports the results.

Table 6 References and links to the online English version versions of the national implementing laws of the Directive 2003/4/CE on Public Access to Environmental Information

State	References and links to online versions
IE	S.I. No. 133/2007 - European Communities (Access to Information on the Environment) Regulations 2007, http://www.irishstatutebook.ie/eli/2007/si/133/made/en/print; S.I. No. 662/2011 - European Communities (Access to Information on the Environment) (Amendment) Regulations 2011, http://www.irishstatutebook.ie/eli/2011/si/662/made/en/print; S.I. No. 615/2014 - European Communities (Access to Information on the Environment) (Amendment) Regulations 2014, http://www.irishstatutebook.ie/eli/2014/si/615/made/en/print; S.I. No. 309/2018 - European Communities (Access to Information on the Environment) (Amendment) Regulations 2018, http://www.irishstatutebook.ie/eli/2018/si/309/made/en/print.
LT	Resolution No 1175 on the Approval of the Procedure for the Provision of Environmental Information of the Republic of Lithuania to the Public, Government of the Republic of Lithuania, https://e-seimas.lrs.lt/portal/legalAct/lt/TAD/082b19d2087f11e687e0fbad81d55a7c?jfwid=2r1mjo4q.
LV	Freedom of Information Law (29.10.1998, with amendments to the law by 22.09.2015) https://likumi.lv/ta/en/en/id/50601-freedom-of-information-law, https://likumi.lv/ta/id/50601-informacijas-atklatibas-likums; Geospatial Information Law (17.12.2009., with amendments to the law by

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

	30.05.2018.)https://likumi.lv/ta/en/id/202999-geospatial-information-law, https://likumi.lv/ta/id/202999-geotelpiskas-informacijas-likums; Environmental Protection Law (2.11.2006, with amendments to the law by 22.06.2020.) https://likumi.lv/ta/en/en/id/147917-environmental-protection-law; Land Management Law (30,10,2014. with amendments to the law by 28.11.2019.) https://likumi.lv/ta/en/en/id/60460-land-register-law; Republic of Latvia Cabinet Regulation No. 158. Regulations Regarding the Requirements with Respect to Environmental Monitoring and the Procedures for Performance Thereof, the Creation of the Register of Polluting Substances and Public Availability of Information (17 February 2009) https://likumi.lv/ta/en/en/id/188150; Republic of Latvia Cabinet Regulation No. 833 Procedures by which the Information Regarding the Fertility Level of the Agricultural Land and the Changes Thereof is Obtained and Compiled (5 October 2004) http://extwprlegs1.fao.org/docs/pdf/lat190873ENG.pdf.
NO	Act relating to the right of access to documents held by public authorities and public undertakings (Freedom of Information), https://lovdata.no/dokument/NLE/lov/2006-05-19-16#KAPITTEL_1
UK	2004 No. 3391, FREEDOM OF INFORMATION, ENVIRONMENTAL PROTECTION, the Environmental Information Regulations 2004, https://www.legislation.gov.uk/uksi/2004/3391/pdfs/uksi_20043391_en.pdf.

The question **Q4** was devoted to investigate whether other provisions, such as other laws or regulations and administrative provisions have been brought into force by a single State to comply with the Directive (2003/4/EC).

Belgium (Region of Flanders), Spain and Hungary did not give any answer, due to little clarity of the question in their opinion, while Switzerland, Czech Republic, France, Ireland, Latvia, and UK gave the same references as well as for the question Q1.

These countries reaffirmed explicitly that the national provisions identified by each country are the solely that have been brought into force in order to ensure compliance to the Directive on public access to environmental information.

Turkey listed some laws not directly in relation to the Directive on public access, such as the Law of Soil Conservation and Land Use (The Law Number is 5403), the Regulation of Conservation, Use and Planning of Agricultural Areas, the Law of Agricultural Reform on Land Planning in Irrigated Areas (The Law Number is 3083), The Law on Environment (Number 2872).

The remaining countries did not give pertinent references.

The results of this question are presented in the table 7.

Table 7 References and links to other laws, administrative provisions and regulations related to the Directive 2003/4/CE on Public Access to Environmental Information

State	References and links to online versions
AT	There are different laws in the federal provinces (there is no possibility to give an overview of all regulations)

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

DE	UIG-Kostenverordnung, Ordinance on fees and expenses for individually attributable public services by the bodies required to provide information in the implementation of the Environmental Information Act, http://www.gesetze-im-internet.de/uiggebv/.
FI	9.2.2001/119, Water Supply Act, https://www.finlex.fi/fi/laki/ajantasa/2001/20010119; 28.1.2005/54, Law amending section 16 of the Water Supply Act, https://www.finlex.fi/fi/laki/alkup/2005/20050054#Pidp445814464; 6.5.2011/419, Act on the Finnish Forest Centre's forest information system, https://www.finlex.fi/fi/laki/ajantasa/2011/20110419; 12.1.2018/66, https://www.finlex.fi/fi/laki/ajantasa/2011/20110419?search%5Btype%5D=pika&search%5Bpika%5D=2003%2F4%2FEY#a12.1.2018-66; 27.6.2014/527, Environmental Protection Act, https://www.finlex.fi/fi/laki/ajantasa/2014/20140527?search%5Btype%5D=pika&search%5Bpika%5D=2003%2F4%2FEY#L18.
IT	Decreto Legislativo del 14 marzo 2013, n. 33, Reorganization of the regulations concerning the obligations of publicity, transparency and dissemination of information by public administrations, https://www.gazzettaufficiale.it/eli/id/2013/04/05/13G00076/sg.
LT	Law on Environmental Protection of the Republic of Lithuania, Official Gazette. 1992, No.5-75, https://e-seimas.lrs.lt/portal/legalActEditions/lt/TAD/TAIS.2493?faces-redirect=true.
NL	Act of September 30, 2015, containing rules regarding the basic registration subsoil (Basic Registration Subsoil Act), https://wetten.overheid.nl/BWBR0037095/2019-04-24, articles 9 and 10
NO	The Constitution of the Kingdom of Norway https://lovdata.no/dokument/NLE/lov/1814-05-17; Spatial data act: https://www.regjeringen.no/en/dokumenter/spatial-data-act/id613612/; Regulations on the Complaints Board for environmental information, https://lovdata.no/dokument/SF/forskrift/2003-12-14-1572; Register on environmental regulations: https://www.miljovedtak.no/.
PL	*Dz. U. z 2020 r. poz. 283, z późn. zm.*, Announcement of the Marshal of the Sejm of the Republic of Poland of February 13, 2020 on the publication of the uniform text of the Act on the provision of information on the environment and its protection, public participation in environmental protection and on environmental impact assessments, http://isap.sejm.gov.pl/isap.nsf/DocDetails.xsp?id=WDU20200000283; Dz. U. z 2019 r. poz. 1429 oraz z 2020 r. poz. 695, Announcement of the Marshal of the Sejm of the Republic of Poland of 5 July 2019 on the publication of the uniform text of the Act on access to public information, https://isap.sejm.gov.pl/isap.nsf/DocDetails.xsp?id=WDU20190001429; Dz. U. z 2019 r. poz. 1446, Announcement of the Marshal of the Sejm of the Republic of Poland of June 28, 2019 on the publication of the uniform text of the Act on the re-use of public sector information, http://isap.sejm.gov.pl/isap.nsf/DocDetails.xsp?id=WDU20190001446; Dz. U. poz. 1249, Regulation of the Council of Ministers of 24 June 2020 amending the regulation on the Polish Classification of Activities (PKD), https://isap.sejm.gov.pl/isap.nsf/DocDetails.xsp?id=WDU20200001249; Dz. U. poz. 1415 oraz z 2016 r. poz. 2089, Regulation of the Minister of the Environment of November 12, 2010 on

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

	fees for disclosing information on the environment, http://isap.sejm.gov.pl/isap.nsf/DocDetails.xsp?id=WDU20102151415; Dz. U. poz. 1485, Regulation of the Minister of Finance of December 3, 2013 on invoicing, http://isap.sejm.gov.pl/isap.nsf/DocDetails.xsp?id=WDU20130001485.
PT	Lei n.º 58/2019, de 8 de agosto, protection of natural persons with regard to the processing of personal data and the free movement of such data, https://dre.pt/application/conteudo/123815982.
SE	Strategy for environmental data management, https://www.naturvardsverket.se/strategi-for-miljodatahantering#.
SK	Decree No. 448/2010 Coll. on the collection, storage and dissemination of environmental information, https://www.slov-lex.sk/pravne-predpisy/SK/ZZ/2010/448/; Decree No. 411/2007, implementing Act No. 205/2004 Coll. on the collection, storage and dissemination of information on the environment and on the amendment of certain laws as amended by Act no. 24/2006 Coll., https://www.slov-lex.sk/pravne-predpisy/SK/ZZ/2007/411/20070901.html.

The following slot of questions (**Q5-7**) intended to collect information on the existence of **soil officer(s) is(are) appointed at national level**, to permit the access to soil information upon request (Article 3 Directive 2003/4/EC), and, if yes, to which mapping requests do(does) the national soil officer(s) answer. As stated in the Article 3(4) "the public authorities shall make all reasonable efforts to **maintain environmental information held by or for them in forms or formats that are readily reproducible and accessible** by computer telecommunications or by other electronic means." Furthermore, Member States should also actively disseminate the environmental information (Article 7), maintaining it updated and easily accessible by means of computer telecommunication and/or electronic technology.

Given the Article 3 and 7 of the Directive, it is requested by MS to organize the environmental information held by public authorities in the form of electronic databases, maintained up-dated and easily accessible by the public. A list of public authorities holding the different kinds of environmental information (e.g. water, air, soil) should also be made publicly accessible. The questions Q5-7 seek to understand if such a system was put in place in the EJP SOIL countries to permit easy access not the environmental information in general, but specifically to soil information.

Q5. On the basis of the article 3 of the 2003/4/EC, has your State appointed "soil information officers"? If yes to the question, please list the officially appointed "soil information officers".

Q6. On the basis of article 3 of the 2003/4/EC, has your State established and maintained facilities for the examination of the soil information ? If yes to the question, please indicate a reference to the facilities established and maintained for the examination of the soil information.

Q7. On the basis of article 3 of the 2003/4/EC, has your State published registers or lists of the environmental information (including soil information) held by public authorities or information points, with clear indications of where such information can be found ? If yes to the question, please indicate a reference to the published registers or lists.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

Q8. If a national soil information service (official or not) exists, to which mapping requests does it answer?

As for the question **Q5**, which investigated whether national soil information officers have been appointed by each European State, the results are the following (figure 6).

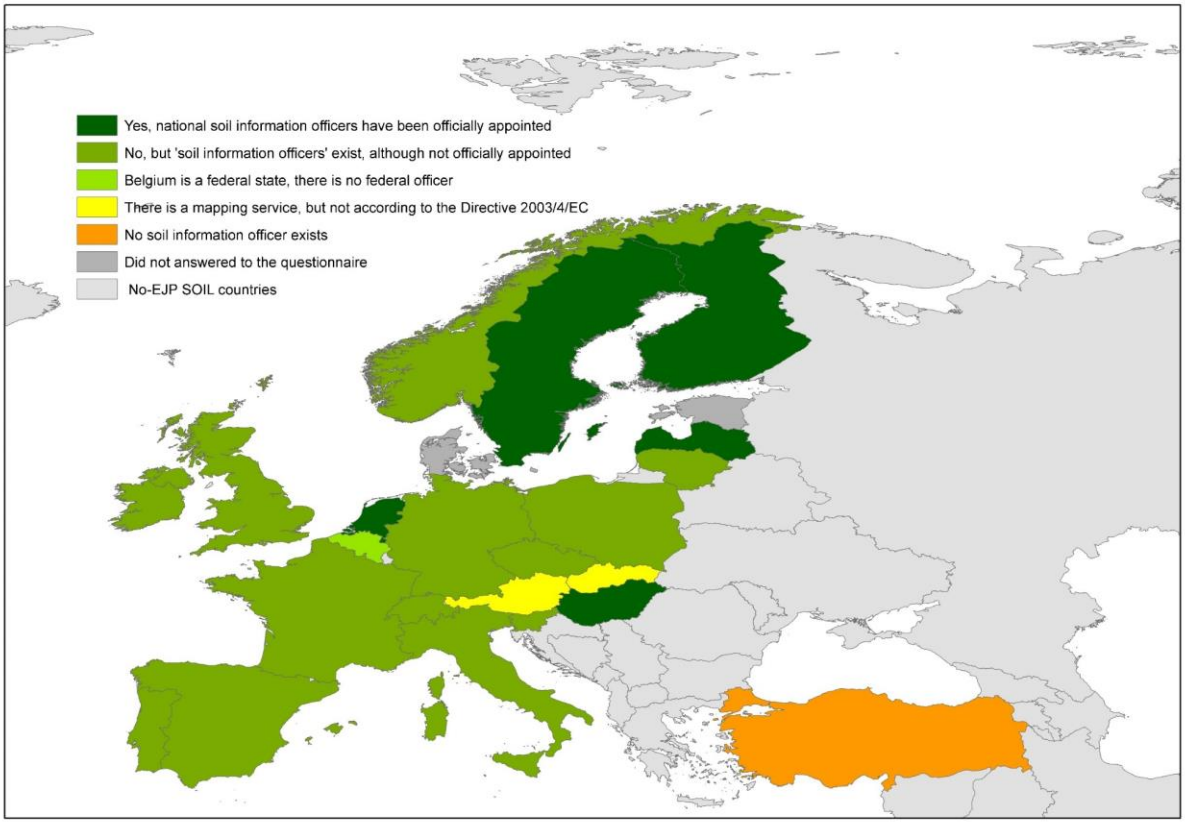

Figure 6 On the presence of national 'soil information officers'

The majority of the respondents (Switzerland, Czech Republic, Germany, Spain, France, Ireland, Italy, Lithuania, Norway, Poland, Portugal, Slovenia, and UK) were aligned with a negative answer, but with a specification: the respective State has not appointed any national soil information officers, which however exist as not officially appointed. These countries were requested to list, if possible, the not officially appointed "soil information officers". The table 8 shows the results.

Table 8 Reference to the "not official" national soil information officers[7]

State	Not official soil information officers
CH	There are several quasi-official institutions or officers appointed. On the governmental level, our office (Swiss Federal Office for the Environment) fulfils the role of soil information officers. On a scientific level, several institutions have soil

[7] *The names and surnames given by the EJP SOIL partners are not shown here, since it is a public deliverable.*

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

	information expertise. The Swiss competence centre for soil (CCSols) maintains and supports various services regarding soil information, probably comparable to EU Topic centres.
CZ	Research Institute for Soil and Water Conservation; Forest Management Institute; Central Institute for Supervising and Testing in Agriculture; Czech geological Survey
DE	A reference person from BGR and a reference person from Thünen.
ES	A reference person from the Ministry for Ecological Transition and Demographic Challenge https://www.miteco.gob.es/en/
FR	Under French Law and in conformity with EU regulation, public officers who can be in charge of access and sharing of such information exist, although they are not called « soil information officers » : articles R124-2 of the Code de l'environnement and L330-1, R330-2 of the Code des relations entre le public et l'administration (CRPA) which require some categories of public administrations to appoint an officer in charge of the access to « public information » and/or to « environmental information » (which includes soil information). In May 2020, a circular was issued by the Ministry for an Ecological Transition, in order to improve the support and the monitoring of the implementation of access to environmental information. This circular provides a set of procedural directives (guidelines, recommendations …) for public administrations in charge of collecting and processing environmental information. Cf. Circulaire du 11 mai 2020 relative à la mise en œuvre des dispositions régissant le droit d'accès à l'information relative à l'environnement (see full text: https://www.legifrance.gouv.fr/circulaire/id/44969).
IE	Teagasc, https://www.teagasc.ie/; EPA, https://www.epa.ie/; Department of the Environment, Climate and Communications, https://www.gov.ie/en/organisation/department-of-the-environment-climate-and-communications/
IT	In the Italian transposition of the law, the paragraph 5 of the article 3, has been partially transposed. No reference has been made to the designation of information officers, nor to the establishment and maintenance of facilities for the examination of the information required. The right of access to environmental information is foreseen to be assured only by registers or lists of the environmental information held by public authorities or information points, with clear indications of where such information can be found. Despite that, with the DM 10879 del 10 ottobre 2005 has been put in place the *Osservatorio Nazionale Pedologico*), which is actually the only officially recognized authority for soil information in Italy. Inside the *Osservatorio Nazionale Pedologico* are grouped the Ministry of Agriculture and Forestry, the Ministry of Environment, the Italian Regions, the research center linked to those Ministries, CREA for environment and forestry, ISPRA for environment, the CNR, the Regional Agencies for Environmental Protection (ARPA), and soil experts inside the Universities. (https://www.reterurale.it/flex/cm/pages/ServeBLOB.php/L/IT/IDPagina/1034)

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

	Inside the web-site of the Ministry for Environment it is published a page concerning the National Center for Soil Mapping (CNCP). https://va.minambiente.it/it-IT/DatiEStrumenti/MetadatoRisorsa/adfe8a05-c7c9-40c4-ab35-aa9c9f24749e. The activity of CNCP is actually performed by CREA, which holds and maintains a national soil database. ISPRA has been officially appointed as officer for environmental information. Therefore ISPRA has responsibility of EIONET NRC LAND USE and planning, and NRC SOIL; and for the application of the 2003/4/EC (https://www.snpambiente.it/si-urp/informazioni-ambientali/). ISPRA is responsible for land monitoring under L.132/2016, the ley on establishment of the national network system for protection of the environment and discipline of the Higher Institute for Protection and Environmental Research (ISPRA) (https://www.gazzettaufficiale.it/eli/id/2016/07/18/16G00144/sg)Inside ISPRA the land and soil theme are treated under the Department for Geological Survey. They produce and publish the Geological Map of Italy at different scales (https://www.isprambiente.gov.it/Media/carg/), the lithological Map of Italy at 1: 100,000 scale, and other lithological maps, land use and land cover maps Layers relating to use and land cover (http://groupware.sinanet.isprambiente.it/uso-coprezza-e-consumo-di-suolo/library/coprezza-del-suolo/carta-di-coprezza- del-soil) and land consumption by urbanisation (http://groupware.sinanet.isprambiente.it/uso-coprezza-e-consumo-di-suolo/library/consumo-di-suolo/). ISPRA NRC Soil monitors the land uptake by urbanisation, updated once a year. ISPRA does not hold a soil database. ISPRA land monitoring responsibility (L.132/2016) is intended as geology, lithology, and land consumption.
LT	The Ministry of Agriculture of the Republic of Lithuania; Ministry of Environment of the Republic of Lithuania; Lithuanian Research Centre for Agriculture and Forestry (LAMMC); Lithuanian Institute of Agrarian Economics; Vytautas Magnus University, Agriculture Academy; Lithuanian Agricultural Advisory Service; SE State Land Fund; SE "GIS-Centras"; National Land Service under the Ministry of Agriculture; Nature Research Centre , Geology and Geography Institute; Lithuanian Geological Survey under Ministry of Environment of the Republic of Lithuania
NO	The head of soil survey dept. NIBIO - Norwegian Institute of Bioeconomy Research; The head of geomatics dept. NIBIO - Norwegian Institute of Bioeconomy Research; the head of Division for housing, property, spatial and agricultural statistics at SSB, Statistics Norway.
PL	Council for Spatial Information Infrastructure. The Council consists of seven Directors of various state bodies e.g. Ministry of Climate and Environment; Chief Surveyor Chief National Geologist of the Country; Chief Inspectorate of Environmental Protection. This is regulated by the act on spatial information infrastructure http://isap.sejm.gov.pl/isap.nsf/DocDetails.xsp?id=wdu20100760489, which is the Polish las transposing the Directive 2007/2/EC, INSPIRE. The act defines principles of creating and using the spatial information infrastructure, which for concerns:

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

	- spatial data and metadata of the spatial information infrastructure - spatial data services; - the interoperability of spatial data sets and spatial data services; - principles of data sharing; - cooperation and coordination principles in the field of spatial information infrastructure.
PT	The Director of the General Directorate of Agriculture and Rural Development (DGADR, Direção-Geral de Agricultura e Desenvolvimento Rural)
SI	Agricultural Institute of Slovenia, University of Ljubljana; Biotechnical Faculty
UK	England & Wales; LandIS – Cranfield University; UK Centre for Ecology and Hydrology. Scotland; James Hutton Institute. Northern Ireland; Agri-Food and Biosciences Institute

Finland, Hungary, Latvia, Netherlands, and Sweden opted for a positive answer and also gave pertinent references of the national soil information officers appointed by the national authorities, as described in the table 9.

Only 4 countries gave a negative answer : Austria, Belgium, Slovakia, Turkey. Belgium clarified that, since it is a federal state, only regional not official soil information officers exist. Austria clarified that they do not have a soil information officer (according to Art. 3 in the 2003/4 EC directive) but instead there is an Austrian mapping service. Slovakia, also, intended the question a restrictive way. Instead, in Slovakia there are soil mapping and monitoring services, coordinated by the Research Institute of Soil Science and Soil Protection, NPPC-VUPOP, and by the Ministry of Environment, respectively.

Table 9 Reference to the officially appointed national soil information officers[8]

State	Not official soil information officers
FI	The management of soil information is scattered among authorities. ELY centers are the competent authorities regarding and maintaining information on soil pollution: https://tem.fi/en/ely-centres; Data systems and data sets of the Finnish environmental administration: https://www.ymparisto.fi/fi-fi/kartat_ja_tilastot/tietojarjestelmat; Finnish Environment Institute: https://www.syke.fi/fi-FI/Avoin_tieto/Paikkatietoaineistot/Ladattavat_paikkatietoaineistot. Geological Survey of Finland (GTK) https://www.gtk.fi/en/front-page/; National Land Survey of Finland: https://www.maanmittauslaitos.fi/en/e-services/geodata-portal-paikkatietoikkuna.
HU	Soil conservation officers are run by the County Governmental Offices covering the whole country. https://portal.cor.europa.eu/divisionpowers/Pages/Hungary-Intro.aspx
LV	Ministry of Agriculture; Ministry of Environmental Protection and Regional Development

[8] *The names and surnames given by the EJP SOIL partners are not shown here, since it is a public deliverable.*

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

NL	357 municipalities, 25 water boards, 12 provinces and 2 ministries have appointed Basisregistratie Ondergrond (BRO, Basic Registration of the Substrate https://basisregistratieondergrond.nl/[9]) officers. BRO includes geology, geomorphology, groundwater and soil. The current head of the Ministry of Interior and Kingdom Affairs, Programme Bureau BRO. The current programme leader BRO Soil: Wageningen Environmental Research. Officials from municipalities, water boards, provinces and ministries.
SE	SGU Sveriges geologiska undersökning

The question **Q6** was devoted to investigate whether the European State established and maintained facilities for the examination of the soil information.
Replies, in general, communicated that almost all the respondents have such facilities. Germany, Hungary, Ireland, Lithuania, Poland, Portugal, and Turkey indicated physical offices where soil information could be examined: Austria, Belgium, Czech Republic, France, Italy, Netherlands, Norway, Sweden, and Slovakia gave online links. This demonstrates that the Directive is vague in the Article 3(5), since it does not specify which kind of facilities are foreseen, leaving the countries free to decide the kind of implementation. Only 5 countries opted for a negative answer to this question: Switzerland, Spain, Latvia, Slovenia, and UK. It should be investigated if those 5 countries has intended the 'facilities' named in the Directive as physical or dematerialized (online) ones. European States which gave a positive answer also indicated pertinent references, as shown in the table 10.

Table 10 Reference and online link to the facilities

State	References and online links to the facilities
AT	Advisory council for soil fertility and soil protection: user board of BORIS Soil information, www.borisdaten.at; Austrian soil map, www.bodenkarte.at; Biosoil, https://bfw.ac.at.
BE-FL	For the region of Flanders: www.dov.vlaanderen.be (soil and subsoil data at Databank Ondergrond Vlaanderen); https://services.ovam.be/ovam-geloketten/#/bodemdossier?x=140410&y=198535&z=10.000000000000007 (data about soil pollution).
CZ	https://geoportal.gov.cz/.
DE	Bundesanstalt für Geowissenschaften und Rohstoffe (BGR), Hannover
FR	In France, the Ministry for Food and Agriculture and the Ministry for an Ecological Transition support the "GIS SOL" consortium ("groupement d'intérêt scientifique sol", see https://www.gissol.fr/) with INRAE, ADEME, BRGM, IGN, IRD and OFB. GIS SOL was created in 2001 to set up and manage an information system on soils in France and to meet the demands of public authorities and society at local and national levels. GIS SOL designs, guides and coordinates the geographic inventory of soils (monitoring their properties and changes in their qualities) and manages the soil information

[9] This is the website of the Subsurface Basic Registration Programme. The program is working on a national facility with reliable information about the Dutch soil and subsoil that is accessible to everyone.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

	system. GIS SOL ensures the valorization of soil data in France, in line with European programs. These programs are carried out by the network of the European Soil Office of the European Commission and the European Environment Agency (EEA). It provides studies and practical tools aimed at facilitating soil information access and sharing, in compliance with international, European and national regulations.
HU	Soil information facilities are at: •county soil conservation officers • soil conservation officers of the National Food Chain Safety Office (http://www.escaa.org/index/action/page/id/6/title/agency-by-country/country/HU); Directorate of Plant Protection, Soil Conservation and Agri – Environment (https://portal.nebih.gov.hu/hu/web/english/hungarian-forest-management/-/asset_publisher/pHBk9pq6UNxK/content/directorate-of-plant-protection-and-soil-conservation/contacts)
IE	National Soil Database for Ireland Irish Soil Information System
IT	ISPRA is responsible for Italy (ley 132 of 2016) for collecting and making accessible to the public the relevant environmental data from activities funded or co-funded by public authorities, and this is done through SINANET (http://www.sinanet.isprambiente.it/it). Information on land consumption by urbanisation is updated yearly and made available (https://webgis.arpa.piemonte.it/secure_apps/consumo_suolo_agportal/), and other thematic mapping are made available through portals (http://portalesgi.isprambiente.it/it, http://www.sinanet.isprambiente.it/it). These thematic mapping already include soil information at regional scale, but still do not include soils information at national scale.
LT	SE “GIS-Centras”; National Land Service under the Ministry of Agriculture; SE State Land Fund; Agrochemical Research Laboratory, Lithuanian Research Centre for Agriculture and Forestry (LAMMC)
NL	https://basisregistratieondergrond.nl/. General information, data catalogues www.broloket.nl. Data platform www.pdok.nl.
NO	Soil maps: https://kartkatalog.geonorge.no/metadata/soil/c961484d-9d4b-4f6a-8bd5-e145e96d1560; Soil Mapping https://nibio.no/en/subjects/soil/soil-mapping; Soil Map services: https://www.nibio.no/tjenester/wms-tjenester/wms-tjenester-jordsmonn.
PL	The Chief Surveyor of the Country is responsible for a publicly available register of sets and services of spatial data covered by the infrastructure and gives them uniform identifiers. The ordinance of the Ministry of the Interior Affaire and Infrastructure on spatial data sets and services covered by the spatial information infrastructure https://sip.lex.pl/akty-prawne/dzu-dziennik-ustaw/ewidencja-zbiorow-i-uslug-danych-przestrzennych-objetych-17655244 Geodetic data collected in the state geodetic and cartographic resource are also the basis (reference) for many state registers whose objects are located on the basis of geodetic data e.g. for registration plots or address points.

This project has received funding from the European Union’s Horizon 2020 research and innovation programme under grant agreement N° 862695

	County (NUTS3) administration offices are responsible at regional level.
PT	The Director of the General Directorate of Agriculture and Rural Development (DGADR, Direção-Geral de Agricultura e Desenvolvimento Rural)
SE	Geodataportalen https://www.geodata.se/geodataportalen. This is the national INSPIRE facility. Sweden has two other facilities for soil information on a national scale: SGU https://www.sgu.se/produkter. and Datavärdskap Jordbruksmark https://www.slu.se/en/departments/soil-environment/environment/data-host/.
SK	https://www.enviroportal.sk/environmentalne-temy/zlozky-zp/poda/cms-poda.
TR	There are some soil information systems under different governmental Institutions. TAGEM has a Soil Fertilizer and Water Resources Central Research Institute Soil Information System.

The last question of this slot (**Q7**), aimed at investigating whether the European State publish registers or lists of the environmental information (including soil information). The majority of participating countries (figure 6) replied opting for a positive answer to this question. Countries answering positively gave links to online registers of metadata for environmental information, but analysing the answers received it is clear that also in this case the reading of the Article 3(5) leads to different interpretations. In fact, France has answered to this question giving a different interpretation of the term "register" : they have given links to controlled vocabularies maintained by BRGM (https://www.brgm.fr/fr), a French public service for geological sciences. Hungary gave a description of where to retrieve soil information, and did not give links to online metadata portals. All the other countries answering positively gave links to lists of metadata of published environmental information. The link given by Austria needs a registration. Belgium gave the link only for the Flanders region. Only Switzerland, Czech Republic, Spain, Ireland, and Slovenia declared that their States don't publish registers or lists of the environmental information held by public authorities or information points. Comparing these answers to the answers received to the questions 19 and 20, where all the countries (with the exception of Turkey), have declared to publish the metadata of their soil spatial datasets and services, it confirms that the meaning of the term '*publish registers or lists*', since some countries have intended it as metadata registers, some other not. Although answering negatively, Switzerland gave some references, reported in the table 11. Turkey opted for a positive answer to the question, however didn't fill in any reference to public registers or lists: the country specified that there is not a unique publication but this information is located under the relevant Institution website.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

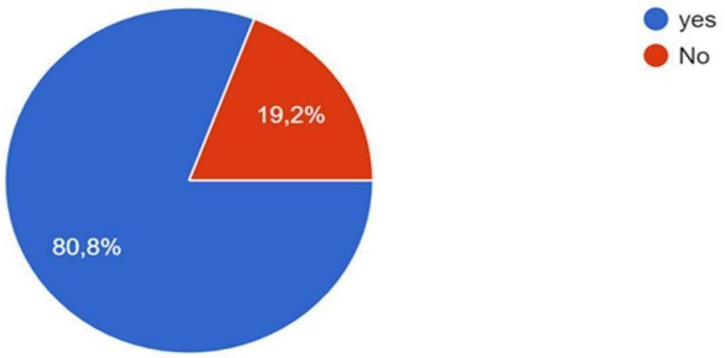

Figure 7 Percentage of the states which publish registers or lists of the environmental information (including soil information) held by the public authorities or information points

Countries which reply positively to the question have been requested to put a reference to the published registers or lists, as shown in the table 11.

Table 11 References to the published registers or lists

State	References to the published registers or lists
AT	https://geometadatensuche.inspire.gv.at/metadatensuche/srv/ger/catalog.
BE-FL	For the region of Flanders: www.dov.vlaanderen.be (Databank ondergrond Vlaanderen) and https://www.geopunt.be/catalogus.
CH	Soil data portal is in the planning stage. Meanwhile, the publicly available soil data can be obtained from the website of the Swiss Soil Information Database NABODAT: https://www.nabodat.ch/index.php/de/service/bodendatensatz. This data contains point data, no maps.
DE	https://www.geoportal.de/portal/main/#; https://geoviewer.bgr.de/.
FI	Data systems and data sets of the Finnish environmental administration: https://www.ymparisto.fi/fi-fi/kartat_ja_tilastot/tietojarjestelmat. HAKKU of Geological Survey of Finland (GTK): https://hakku.gtk.fi/. Geodata portal Paikkatietoikkuna of National Land Survey of Finland: https://www.maanmittauslaitos.fi/en/e-services/geodata-portal-paikkatietoikkuna. Suomen maannostietokanta 1:250 000 https://jukuri.luke.fi/bitstream/handle/10024/441748/mtts114.pdf?sequence=1&isAllowed=y.
FR	The publication of registers or lists of environmental information are among the most important directives of the ministerial circulars. Examples: Register of anthropogenic materials, https://data.geoscience.fr/ncl/AnthroMat; Register of dominant formations of lithostratigraphic units, https://data.geoscience.fr/ncl/LithoStratForDo; Fossil record

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

	https://data.geoscience.fr/ncl/GeolFos; register of types of geological units, https://data.geoscience.fr/ncl/GeolUnitTyp; Lithology register, https://data.geoscience.fr/ncl/litho; Mineral registers, https://data.geoscience.fr/ncl/Minls; Register of objects of interest, chemical parameters, https://data.geoscience.fr/ncl/ObjParSubs; Register of types of observation media, https://data.geoscience.fr/ncl/obssup; Register of observed properties, https://data.geoscience.fr/ncl/ObsProp; Method/process register, https://data.geoscience.fr/ncl/; Register of units of measure https://data.geoscience.fr/ncl/uom; Register of sensor types, https://data.geoscience.fr/ncl/SenTy; Register of sedimentary structures and figures, https://data.geoscience.fr/ncl/GeolStrcSed.
HU	Soil information can be found at: •county soil conservation officers •soil conservation officers of the National Food Chain Safety Office (http://www.escaa.org/index/action/page/id/6/title/agency-by-country/country/HU); Directorate of Plant Protection, Soil Conservation and Agri – Environment (https://portal.nebih.gov.hu/hu/web/english/hungarian-forest-management/-/asset_publisher/pHBk9pq6UNxK/content/directorate-of-plant-protection-and-soil-conservation/contacts) •MTA-ATK •Universities
IT	The following links are available on environmental information. http://www.pcn.minambiente.it/mattm/catalogo-metadati/; http://portalesgi.isprambiente.it/it; http://www.sinanet.isprambiente.it/it; https://annuario.isprambiente.it/; https://www.snpambiente.it/2020/05/19/e-online-il-nuovo-portale-dellispra/ https://www.sian.it/portale-sian/home.jsp; https://webgis.arpa.piemonte.it/secure_apps/consumo_suolo_agportal/.
LT	https://www.geoportal.lt/geoportal/web/en; https://zis.lt/en/; SE “GIS-Centras”; National Land Service under the Ministry of Agriculture (LIS supervisor); SE State Land Fund (LIS manager); Agrochemical Research Laboratory, Lithuanian Research Centre for Agriculture and Forestry (LAMMC)
LV	https://data.gov.lv/dati/lv/dataset?q=augsne.
NL	www.nationaal georegister.nl, national geo register, and data.overheid.nl/ Open data of the government
NO	National spatial data infrastructure (Geonorge) map catalogue - https://www.geonorge.no/; Environmental Norway: https://www.environment.no/.
PL	www.geoportal.gov.pl; http://www.gdos.gov.pl/jak-uzyskac-informacje.
PT	Acesso do público às informações sobre ambiente - Relatório de Portugal sobre a experiência adquirida na aplicação da Directiva 2003/4/CE https://apambiente.pt/index.php?ref=16&subref=142&sub2ref=726&sub3ref=729; https://sniamb.apambiente.pt/?language=pt-pt.

This project has received funding from the European Union’s Horizon 2020 research and innovation programme under grant agreement N° 862695

SE	https://www.geodata.se/geodataportalen.
SK	https://www.enviroportal.sk/en/about-enviroportal; https://www.enviroportal.sk/en/environmental-burdens/registers-of-the-public-administration-information-system
UK	UK Wide: http://www.ukso.org/. Northern Ireland: https://www.nidirect.gov.uk/articles/accessing-environmental-information. England & Wales: https://www.gov.uk/guidance/access-the-public-register-for-environmental-information; https://eip.ceh.ac.uk/; http://www.landis.org.uk/soilscapes/. Scotland: https://soils.environment.gov.scot/soils-in-scotland/state-of-scotlands-soils/; https://www.hutton.ac.uk/learning/natural-resource-datasets/soilshutton/soils-maps-scotland/; https://www.environment.gov.scot/.

As regards to the question **Q8**, aiming at verifying to which mapping requests the national soil information officers answer, countries were requested to opt among multiple choices: national scale mapping (1 :500.000 to 1 :250.000 scale); collaboration to the international scale mapping (> 1 :500.000 scale); collaboration to regional scale mapping (1 :50.000 to 1 :250.000 scale). Countries could also fill in "the mapping service is not given".

Belgium, and Turkey, have no national soil information officer and the mapping service is not given. Latvia has an officially appointed national soil information officer, but the mapping service is not given. Spain, and Switzerland have a non official national soil information officer, but the mapping service is not given. Austria, and Slovakia do not have a soil information officer (according to Art. 3 in the 2003/4 EC directive) but he mapping service is given.

As it could be expected (figure 8), the main mapping service given by the national soil officers is at national scale, but half of them also declared collaboration at regional scale mapping, and with the same proportion to the international scale mapping.

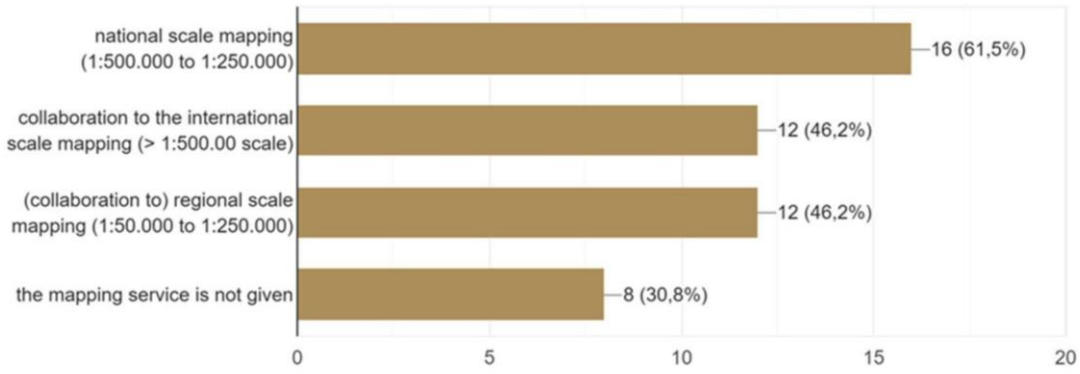

Figure 8 Percentages of the mapping requests to which the national soil information officers answer

The table 12 shows the detailed results :

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

Table 12 Mapping services given by the national soil information officers

State	Collaboration to the international scale mapping (> 1:500.00 scale)	National scale mapping (1:500.000 to 1:250.000)	Collaboration to the regional scale mapping (1:50.000 to 1:250.000)	Mapping service not given
AT		x	x	
CH				x
CZ	x	x	x	
DE	x	x	x	
ES				x
FI		x		
FR	x	x	x	
HU			x	
IE		x		
IT	x	x		
LT	x	x		
LV				x
NL[10]	x	x	x	
NO			x	
PL	x	x	x	
PT	x	x	x	
SE	x	x	x	
SI	x	x	x	
SK		x	x	
UK		x	x	

The following slot of questions (**Q9**-**Q10**) were devoted to investigate the existence of regional/federal state soil information officers, and to which mapping requests they answer.

Q9. Did your State/Region appointed regional/federal-state "soil information officers"?

Q10. If regional/federal-states soil information service (official or not) exist, to which mapping requests do they answer?

In relation to the question **Q9**, the answers demonstrated that the majority of participating countries didn't appoint official regional/federal-state "soil information officers" (figure 9).

12 countries, the majority, declared that they do not have regional/federal-state "soil information officers", neither un-official ones: Austria, Czech Republic, Spain, Finland, France, Latvia, Poland,

[10] Scale 1:50.000 is the national scale in the Netherlands, but smaller scales up to 1:250.000 are also provided

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

Sweden, Slovenia, Slovakia, and Turkey. Among those Turkey do not have soil information officers neither at national scale.

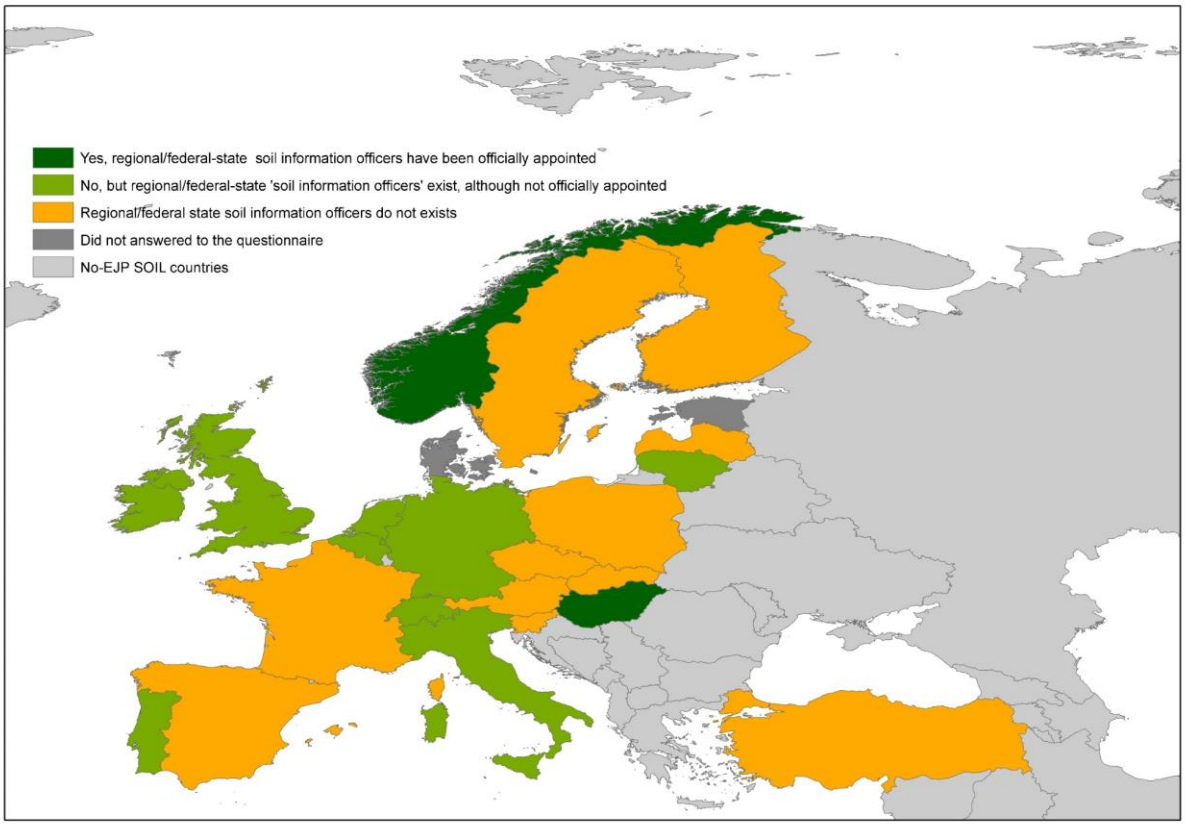

Figure 9 On the presence of regional/federal state 'soil information officers'

Only two countries declared that they have officially appointed regional/federal-state "soil information officers": Norway and Hungary. 9 countries, Belgium, Switzerland, Germany, Ireland, Italy, Lithuania, Netherlands, Portugal, and UK declared that they have not-officially appointed regional/federal-state "soil information officers''. Among those, Belgium is the only one which does not have a national soil information officer. Among these 9 countries, 8 gave pertinent references. Germany specified that personal data can be made available for specific requests only. The table 13 shows the detailed results.

Table 13 Reference to the Regional/federal soil information officers, official and not official[11]

State	Reference to the Regional/federal soil information officers, official and not official
BE-FL	Flemish Planning Bureau for the Environment and Spatial Development (VPO: soil data); Openbare Afvalstoffen Maatschappij (OVAM: soil pollution data)
CH	A general list of the cantonal points of contact for soil can be obtained from the following website https://www.kvu.ch/de/adressen/boden. All contact to the cantons shall be coordinated with this office, the Swiss Federal Office for the

[11] *Any parsonal data was given here by the EJP SOIL partners.*

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

	Environment, Soil section: https://www.bafu.admin.ch/bafu/de/home/amt/abteilungen-sektionen/abteilung-boden-und-biotechnologie/sektion-boden.html.
DE	Data not specified
HU	County soil conservation officers run by County Governmental Offices.
IE	Teagasc; EPA; Department of the Environment, Climate and Communications
IT	Inside each administrative italian region the "soil information officers" exist or not exist, and "soil" can be managed under different offices, depending on the region: e.g. environmental or agricultural offices, by external Agencies or by regional departments, or even by sub-contracted private companies. ERSAF and Consorzio LaMMA, which has answered to the questionnaire, are non-officially appointed officers for soil information of Lombardy and Tuscany respectively. These "soil information officers" are coordinated by CREA-CNCP to produce mapping services at national scale. Recent examples of delivered maps are: the map of "less favoured areas", the GSOCmap, and the GSSmap. ISPRA has established a "Geological Coordination Committee between the State and the Regions" between the structures that deal with geology at national and regional level, as an initial step in the creation of the Italian network of geological services (RISG, http://portalesgi.isprambiente.it/it/consiglio-risg). The coordination established several thematic tables. Inside the national network of environmental agencies SNPA a land cover/land consumption by urbanisation network of regional officers is established (https://www.snpambiente.it/attivita/tavoli-istruttori-del-consiglio-tic/tic-v-sinanet-reporting-comunicazione-formazione-educazione-ambientale/monitoraggio-del-territorio-e-del-consumo-di-suolo/)
LT	SE "GIS-Centras"; National Land Service under the Ministry of Agriculture (http://zis.lt/en/duomenys); SE State Land Fund (LIS manager); Agrochemical Research Laboratory, Lithuanian Research Centre for Agriculture and Forestry (LAMMC)
NL	Wageningen Environmental Research, Dorothée van Tol-Leenders
NO	NIBIO - Norwegian Institute of Bioeconomy Research; SSB - Statistics Norway.
PT	The Director of the General Directorate of Agriculture and Rural Development (DGADR, Direção-Geral de Agricultura e Desenvolvimento Rural)
UK	England & Wales: •LandIS – Cranfield University •UK Centre for Ecology and Hydrology Scotland: •James Hutton Institute Northern Ireland: •Agri-Food and Biosciences Institute

In relation to the question **Q10**, aiming at investigating to which mapping requests regional/federal soil information officers (official or not) answer, 10 of the 12 countries, which do not have

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

regional/federal-state "soil information officers", coherently also declared that the mapping service is not given, but unexpectedly Slovakia declared that they give regional scale mapping (1:50.000 to 1:250.000) service, and France declared that they collaborate to national scale mapping (1:500.000 to 1:250.000). Therefore, for Slovakia and France the declared mapping service is given by national soil information officers.

Among the 11 countries with regional/federal-state "soil information officers", as it could be expected, the main mapping service given was the regional scale mapping. Italy, and the UK declared that they also collaborate on national scale mapping. Belgium, Germany, and Portugal declared that they participated either to the national and to the international scale mapping. Ireland declared that they do not give the service for the regional scale mapping, but instead they collaborate to the national scale mapping. The table 14 shows the detailed results.

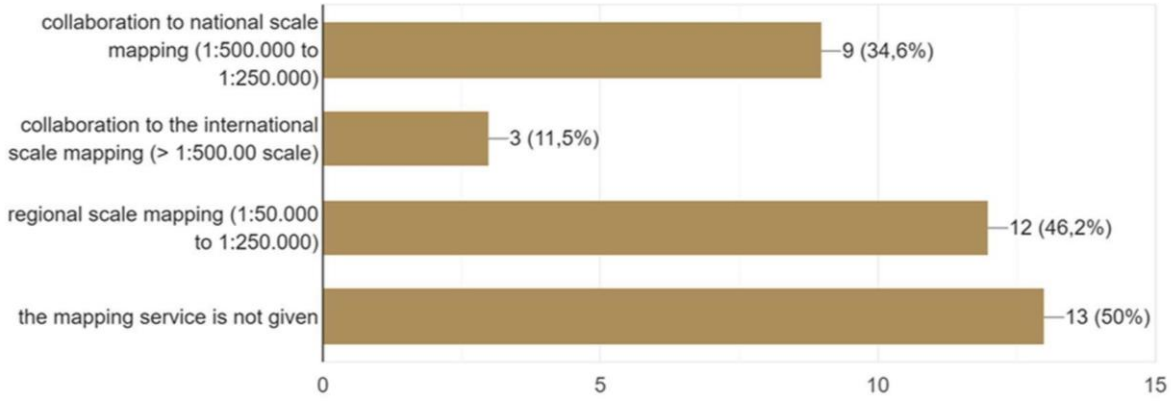

Figure 10 Percentages of the mapping requests to which the regional/federal-state soil information officers answer

Table 14 Mapping services given by the regional/federal state soil information officers

State	Collaboration to the international scale mapping (> 1:500.00 scale)	National scale mapping (1:500.000 to 1:250.000)	Collaboration to the regional scale mapping (1:50.000 to 1:250.000)	Mapping service not given
BE-FL	x	x	x	
CH			x	
DE	x	x	x	
FR		x	x	
HU			x	
IE		x		
IT		x	x	
LT				x
NL				x

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

NO			x	
PT	x	x	x	
SK			x	
UK		x	x	

The following 2 questions (**Q11**-**Q12**) were devoted to investigating which soil information officers were responsible for soil indicators mapping and for soil monitoring.

Q11. Which soil information service(s) is(are) supplying the mapping services needed to answer the request for soil indicators mapping coming from the European Commission ?

Q12. Which soil information service(s) is(are) supplying the soil monitoring service ?

Q11 was devoted to investigating which soil information service(s) is(are) supplying the mapping services needed to answer to the request for soil indicators mapping coming from the European Commission.

13 countries declared that the service is given by a national centralized soil service. Among these, 7 countries, namely Czech Republic, Finland, France, Hungary, Latvia, Poland, Slovenia, and Sweden, do not have regional/federal soil services, 5 countries, namely Germany, Lithuania, Netherlands, Norway, and Portugal, do have regional/federal soil services.

In 4 countries the service is given as a collaboration between the national and the regional/federal-states soil services. 3 of these countries are Switzerland, Ireland, and Italy, which have both national and regional/federal soil services. The fourth is Belgium, although it declared having only regional soil services.
UK and Spain, although having un-official soil officers, answered that they don't give the service for soil indicators mapping.

Austria, Turkey, and Slovakia, which had declared not having a soil officer, neither at national nor at regional/federal state level, gave a wider explanation here, in relation to the soil indicators mapping service, which helps interpreting also the previous answers. The table 15 shows the detailed results.

Table 15 Reference to soil information service(s) supplying the soil indicators mapping services

State	Reference to soil information service(s) supplying the soil indicators mapping services
AT	There is no centralized service. Basically, requests are assigned by the Ministry of Agriculture individually to different institutions that cooperate within a framework ("b5 – Cooperate Soil Competence") and which take action on demand.
BE-FL	A collaboration between the national and the regional/federal-states soil services
CH	A collaboration between the national and the regional/federal-states soil services

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

CZ	National centralized soil service
DE	National centralized soil service
ES	None, service not supplied by our country
FI	National centralized soil service
FR	National centralized soil service
HU	National centralized soil service
IE	A collaboration between the national and the regional/federal-states soil services
IT	A collaboration between the national and the regional/federal-states soil services
LT	National centralized soil service
LV	Information is provided by Ministry of Agriculture or Ministry of Environmental Protection and Regional Development
NL	National centralized soil service
NO	National centralized soil service
PL	National centralized soil service
PT	National Soil Service – Directorate of Agriculture and Rural Development in collaboration with universities as member of Portuguese Soil Partnership
SE	National centralized soil service
SI	National centralized soil service. Research institutions (e.g. Agricultural Institute of Slovenia) on request.
SK	Data are collected upon request from individual institutions
TR	There is no mapping service yet, but the service is under construction in the Ministry of Environment and Urbanization. Different Institutions produce different soil indicators maps.
UK	None, service not supplied by our country

Q12 investigated which soil information service(s) is(are) supplying the soil monitoring service.

16 countries declared that the service is given by a national centralized soil service, namely Czech Republic, Germany, Spain, France, Finland, Hungary, Lithuania, Latvia, Netherlands, Norway, Sweden, Slovenia, Slovakia, Poland, and Portugal.

In Belgium the service is given by the regional soil officers, since there is not a national soil information one. Italy and Austria are in a similar condition, since the service is given only by some of the regional (for Italy) or federal state (for Austria) soil services (soil officers).

In Switzerland the service is given as a collaboration between the national and the regional/federal-states soil services.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

Slovenia declared they give a soil monitoring service at national scale, but only on demand, therefore it is not a monitoring constantly maintained in place and functioning. Ireland, Turkey, and UK answered that they don't give the service. The table 16 shows the detailed results.

Table 16 Reference to soil information service(s) supplying the soil monitoring service

State	Reference to soil information service(s) supplying the soil monitoring service
AT[12]	Regional/federal-states soil services
BE-FL	Regional/federal-states soil services
CH	A collaboration between the national and the regional/federal-states soil services
CZ	National centralized soil service
DE	National centralized soil service
ES	National centralized soil service
FI	National centralized soil service
FR	National centralized soil service
HU	National centralized soil service
IE	None, service not supplied by our country
IT[13]	Regional/federal-states soil services, but which are not active in all the Italian regions.
LT	National centralized soil service
LV	National centralized soil service
NL	National centralized soil service
NO	National centralized soil service
PL	National centralized soil service
PT[14]	National centralized soil service
SE	National centralized soil service
SI[15]	National soil monitoring system
SK[16]	National soil monitoring system
TR	None, service not supplied by our country
UK	None, service not supplied by our country

The following 2 questions (**Q13**-**Q14**) were devoted to investigate if the country contributed to the soil mapping activity of Global Soil Partnership of FAO (GSP-FAO) and through which soil information service.

[12] There is no soil monitoring system in Austria except in two federal states (Styria, Upper Austria) which regularly execute soil investigation campaigns
[13] But they are not active in all the Italian regions.
[14] National Soil Service – General Directorate of Agriculture and Rural Development in collaboration with universities as member of Portuguese Soil Partnership
[15] AIS on request can give this service. Therefore it is not a monitoring constantly maintained in place and functioning.
[16] https://www.enviroportal.sk/environmentalne-temy/zlozky-zp/poda/cms-poda

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

The GSP (http://www.fao.org/global-soil-partnership/en/) is a FAO worldwide initiative aimed at promoting soil protection. The country's contribution is on a voluntary basis. The Pillar 4 of GSP on *information and data* (http://www.fao.org/global-soil-partnership/pillars-action/4-information-data/en/) has the objective to "enhance the quantity and quality of soil data and information: data collection (generation), analysis, validation, reporting, monitoring and integration with other disciplines." This objective has led to the promotion and launch of a worldwide mapping activity, which has been put in place through harmonised procedures, but with a country-driven approach. The pillar 4 activity is based on the establishment of a world network of soil information services, the so-called International Network of Soil Information Institutions (INSII, http://www.fao.org/global-soil-partnership/insii/en/). GSP National Focal Points are "designed by FAO members countries", with no defined rules for the designation procedure, therefore the countries themselves decide which public authority and by which procedure the National Focal Points are designed. The National Focal Points design then which is(are) the Soil Information Institution(s) of their respective countries and the reference personnel inside that(those) institution(s).

Although GSP is still on a voluntary basis, and it is still not clearly defined its relationship with the national/european soil protection policies, the concrete impact of GSP has become evident in the facts, especially as driven by the intense mapping activity. Although the GSP maps are produced on an international scale (1 km pixel grid), they are becoming officially recognised products to be used as a reference at least for the national scale soil policies purposes. These were the reasons why it was interesting to investigate the EJP SOIL countries participation in the GSP pillar 4 activities.

The question **Q13** was directed to collect information about the collaboration to the soil mapping activity of FAO-GSP.

All the countries, except for Latvia, declared a collaboration with the soil mapping activity of GSP. Therefore, also the countries without a soil information officer, and which do not give soil indicators mapping and/or soil monitoring service, declared that they collaborate with the GSP mapping activity, which demonstrates the great success of the GSP pillar 4 initiative.

The following question (**Q14**) was aimed to investigate on which soil service(s) was (were) collaborating to the GSP soil mapping activities. Countries were requested to choose among different options of services (more than one answer was possible):

- National centralized soil service;
- Regional/federal-states soil services;
- A collaboration between the national and the regional/federal-states soil services;
- None, service not supplied by our country;
- Other.

12 EJP SOIL countries, the majority, declared that the service was given by the national soil service, namely Switzerland, Czech Republic, Germany, Hungary, Finland, France, Lithuania, Netherlands, Norway, Portugal, Poland, and Slovenia.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

Italy, Ireland, and UK declared that the service was given as a collaboration between the national and the regional/federal-states soil services.
In Belgium the service is given by the regional soil officers, since there is not a national soil information one.
In Spain the service is given by the EJP SOIL partner CSIC (incorporating INIA), which is not a soil information officer.
It is interesting that Slovakia and Turkey, which have declared not having a soil information officer, instead participate to the GSP pillar 4 mapping activity, and the EJP SOIL partners are the officially appointed INSII members.
In Austria there is no central unit collaborating with FAO-GSP in terms of soil information officer. The ministry for agriculture is the GSP partner for general issues, and occasionally in case of specific projects (e.g. LUCAS Soil Austria or Austrian Soil Organic Carbon map as part of the GSOC) some soil science institutions act as partners in behalf of the ministry.
Latvia declared that the collaboration with the GSP pillar4 soil mapping activity is a service not given.
Detailed results are shown in the table 17.

Table 17 Reference to soil information officer(s) collaborating to the soil mapping activity of FAO-GSP

State	Reference to soil information officer(s) collaborating to the soil mapping activity of FAO-GSP
AT	There is not a soil information service collaborating to FAO-GSP but the ministry of agriculture and, occasionally, some institutions in behalf of the ministry collaborate to FAO-GSP mapping activity.
BE-FL	Regional/federal-states soil services
CH	National centralized soil service
CZ	National centralized soil service
DE	National centralized soil service
ES	CSIC-INIA, therefore not the soil information officer
FI	National centralized soil service
FR	National centralized soil service
HU	National centralized soil service
IE	A collaboration between the national and the regional/federal-states soil services
IT	A collaboration between the national and the regional/federal-states soil services
LT	National centralized soil service
LV	None, service not supplied by our country
NL	National centralized soil service
NO	National centralized soil service
PL	National centralized soil service
PT[17]	National centralized soil service

[17] General Directorate of Agriculture and Rural Development and Algarve University as a member of Portuguese Soil Partnership

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

SE	SLU, therefore not the soil information officer
SI[18]	National centralized soil service
SK	Soil information system, affiliated with NPPC, and the Soil Science and Conservation Research Institute
TR	TAGEM (INSII) and related Institutions
UK	A collaboration between the national and the regional/federal-states soil services

The last question of the section A (**Q15**) focuses on the national legal framework for soil data sharing existing in the EJP SOIL countries, besides the laws, regulations and administrative provisions brought into force to comply with the Directives 2003/4/EC and 2007/2/EC. The respondent was asked to list the legal references and give useful observations for a better knowledge of national overview on the topic. They could give "none" as an answer.

The answer "none" was given by 6 countries : Austria, Spain, Poland, Portugal, Sweden, and Slovenia. Germany, and Hungary answered they don't know. Turkey generally answered that "soil data sharing is done according to rules of each data owner Institution currently". Belgium, Latvia, Lithuania, and Netherlands gave the same references given for the Q1, the Q2, or Q4.
All the other countries gave references to specific legislation, which is reported in the table 18.
The framework given by Switzerland is more related to the INSPIRE directive (therefore complements the answer to Q18), than to the 2003/4/EC.

Table 18 Reference to national legal framework for soil data sharing

State	References and links to online versions
BE-FL	https://overheid.vlaanderen.be/organisatie/informatiemanagement/omzetting-psi-richtlijn
CH	Besides the laws referenced to above, there is a special law on geoinformation (more or less analogous to "INSPIRE"), which consists of regulations on how to compile, transform, transfer, store, display information that have a geographical context (e.g. coordinates): https://www.fedlex.admin.ch/eli/cc/2008/388/de
CZ	LAW n° 106, of 11 May 1999, on free access to information, https://aplikace.mvcr.cz/sbirka-zakonu/ViewFile.aspx?type=c&id=3256
FI	Environmental Protection Act, Ympäristönsuojelulaki, 27.6.2014/527, https://www.finlex.fi/fi/laki/ajantasa/2014/20140527?search%5Btype%5D=pika&search%5Bpika%5D=2003%2F4%2FEY#L18139. Obligation to report in connection with the transfer of land, the seller's obligation to provide information on the soil condition of the property: "The transferor or lessee of the land shall provide the new owner or occupier with available information on the activities carried out in the area and on waste or substances that may cause or have caused soil or groundwater pollution, as well as any studies or remediation measures carried out in the area."
FR	i) General texts : Soil data sharing activities may be subject to the combination of the following laws

[18] Voluntary and/or on request of individual Ministry of Agriculture or Ministry of Environment

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

	Code of Environment, code de l'environnement, https://www.legifrance.gouv.fr/codes/texte_lc/LEGITEXT000006074220/; Code of relations between the public and the administration (CRPA): title I of book III (articles L. 311-1 and following), code des relations entre le public et l'administration (CRPA) : titre I du livre III (articles L. 311-1 et suivants), https://www.legifrance.gouv.fr/codes/article_lc/LEGIARTI000033218946/; LAW n ° 2016-1321 of October 7, 2016 for a Digital Republic, LOI n° 2016-1321 du 7 octobre 2016 pour une République numérique, https://www.legifrance.gouv.fr/jorf/id/JORFTEXT000033202746/; LAW n ° 2016-1087 of August 8, 2016 for the reconquest of biodiversity, nature and landscapes, LOI n° 2016-1087 du 8 août 2016 pour la reconquête de la biodiversité, de la nature et des paysages,https://www.legifrance.gouv.fr/loda/id/JORFTEXT000033016237/; LAW n ° 78-17 of January 6, 1978 relating to data processing, files and freedoms, LOI n° 78-17 du 6 janvier 1978 relative à l'informatique, aux fichiers et aux libertés, https://www.legifrance.gouv.fr/loda/id/JORFTEXT000000886460/. ii) Specific texts: Regulation texts for data sharing for contaminated sites and shrinkage and swelling of clays Order of 17 October 1994 relating to the computerization of the national inventory of polluted sites and soils at the Ministry of the Environment, arrêté du 17 octobre 1994 relatif à l'informatisation de l'inventaire national des sites et sols pollués au ministère de l'environnement, https://www.legifrance.gouv.fr/loda/id/LEGITEXT000005616877/; Order of 10 December 1998 relating to the creation of a database on industrial sites and old service activities, arrêté du 10 décembre 1998 relatif à la création d'une base de données sur les sites industriels et d'activités de service anciens, https://www.legifrance.gouv.fr/loda/id/JORFTEXT000000210656/; Decree No. 2015-1353 of October 26, 2015 relating to the soil information sectors provided for by Article L. 125-6 of the Environment Code and laying down various provisions on soil pollution and mining risks, décret n° 2015-1353 du 26 octobre 2015 relatif aux secteurs d'information sur les sols prévus par l'article L. 125-6 du code de l'environnement et portant diverses dispositions sur la pollution des sols et les risques miniers, https://www.legifrance.gouv.fr/jorf/id/JORFTEXT000031388551; LAW No. 2018-1021 of 23 November 2018 relating to changes in housing, development and digital technology (1), article 68, Sub-section 2 "Prevention of the risks of differential ground movement following drought and rehydration soils, LOI n° 2018-1021 du 23 novembre 2018 portant évolution du logement, de l'aménagement et du numérique (1), article 68, Sous-section 2 « Prévention des risques de mouvement de terrain différentiel consécutif à la sécheresse et à la réhydratation des sols, https://www.legifrance.gouv.fr/jorf/article_jo/JORFARTI000037639571, et voir https://www.georisques.gouv.fr/articles-risques/recommandations-et-reglementations-0#la-loi-elan.
IE	Freedom of Information Act, http://www.irishstatutebook.ie/eli/1997/act/13/enacted/en/html

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

IT	Establishment of the National Network for the Protection of the Environment and Discipline of the Higher Institute for Protection and Environmental Research, , LEGGE 28 giugno 2016, n. 132, https://www.gazzettaufficiale.it/eli/id/2016/07/18/16G00144/sg.
LT	Regarding the Government of the Republic of Lithuania October 22 Resolution no. 1175 "On the Amendment to the Procedure for Providing Environmental Information to the Public in the Republic of Lithuania", Resolution of the Government of the Republic of Lithuania, State of knowledge, 2005-02-24, Nr. 26-831, https://e-seimas.lrs.lt/portal/legalAct/lt/TAD/TAIS.250678
LV	Land Management Law (30.10.2014. with amendments to the law by 28.11.2019.) https://likumi.lv/ta/en/en/id/60460-land-register-law; In amendments in 2019 this law sets, that state will develop regulations on Soil Information System and soil mapping, soil information management
NL	https://wetten.overheid.nl/BWBR0037095/2019-04-24
NO	https://www.geonorge.no/en/infrastructure/norway-digital/
SK	Act No. 3/2000 Coll. on Free Access to Information and on Amendments to Certain Acts (Freedom of Information Act), https://www.slov-lex.sk/pravne-predpisy/SK/ZZ/2000/3/; Act No. 95/2019 Coll. on Information Technologies in Public Administration and on Amendments to Certain Acts, https://www.slov-lex.sk/pravne-predpisy/SK/ZZ/2019/95/20200701; Act no. 305/2013 Coll. on the electronic form of the exercise of powers by public authorities and on the amendment of certain laws (Act on e-Government), https://www.slov-lex.sk/pravne-predpisy/SK/ZZ/2013/305/20170301; Decree no. 78/2020 Coll. on standards for public administration information technology, https://www.slov-lex.sk/pravne-predpisy/SK/ZZ/2020/78/20200501
TR	Soil data sharing is done according to rules of each data owner Institution currently
UK	No specific legislation exists on the area of soil dataset sharing apart from Directives 2003/4/EC and 2007/2/EC. The new UK Agriculture Act (2020) (https://publications.parliament.uk/pa/bills/cbill/58-01/0007/20007.pdf.) has as stated objectives: 1) protecting or improving the quality of soil; 2) promoting the health or quality of plants, fungi or soil; 3) protecting or improving the quality of soil. 4) Under Part 3 – Collection and Sharing of Data – agri food supply chains must provide information on request related to the 3 topics above.

3.1.1 Results of the analysis of the section A

RESULTS IN A NUTSHELL
As to the Implementation of the Directive 2003/4/EC, the following barriers emerged: • heterogeneity/non uniformity of domestic legal frameworks on environmental information • lack of implementing provisions in Sweden, although is a Member State; • lack of implementing provisions in Turkey since it is not a Member State;

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

- fragmentation in the implementation within different national laws and provisions in most of the countries;
- lack of an English version of national implementation law/provision in most of the countries, which although not requested would be useful;
- lack of officially appointed soil information officers, and in some cases complete lack of soil information officers neither unofficial ones (Austria, Turkey, and Slovakia);
- lack of uniformity in the soil information's services offered.

These barriers can be overcome by actions undertaken by the EJP SOIL countries at national level, which will be facilitated by the EJP SOIL program, aimed at :

- promoting the transposition into national legislation by Sweden and at least the adoption of the Aarhus Convention by Turkey;
- encouraging the consolidation of the implementation laws and provision in a unique domestic legal law;
- providing, at least, an official brief summary in English of the implementation, made available online;
- stimulating the designation of official soil information officers;
- promoting the networking of soil data holders, owners, and expert groups at national and supranational level;
- promoting a uniform provision of services by supporting their implementation in case they are not provided yet.

In particular, the EJP SOIL will facilitate this process through the organisation of national policy forums and national meetings with soil data holders, owners, and expert groups and all the key stakeholders dealing with soil data management and soil reporting at national level. These activities will be performed in collaboration between WP6, WP8, and WP9, also coordinating with the European Environment Agency, the Joint Research Center, and the European Soil Partnership.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

3.2 INSPIRE INFRASTRUCTURE FOR SOIL DATA (Section B)

The Section aims at offering a glance on the state of the art on the implementation at national level of the Directive 2007/2/CE, INSPIRE (INfrastructure for SPatial InfoRmation in Europe), entered into force on May 15, 2007. The purpose of the Directive is to ensure that the spatial data infrastructures of all Member States are compatible and usable in a Pan-European context, in order to overcome the problems regarding the availability, quality, organization and accessibility of data.
INSPIRE intends to facilitate the search for spatial data through the web, focusing attention on community environmental policies and on policies or activities that may have repercussions on the environment, through the infrastructures for spatial information created by the Member States. Each state of the European Union must implement its own national spatial data infrastructure (SDI), coordinating the sub-national levels and making geographic data, metadata and services available.

The questions of this section (**Q16-18**) aimed at investigating the status quo of the transposition of the Directive 2007/2/CE across EJP SOIL countries in general, and specifically for soil data.

Q16. Has your State transposed the INSPIRE Directive (2007/2/EC) in relation to soil data, into national law? If yes to the question, please list the specific references.

Q17. Is an official English version of the national legislation transposing the INSPIRE Directive (2007/2/EC) law available? If yes to the question, please list the specific references.

Q18. Which laws, regulations and administrative provisions have been brought into force by your country/region to comply with the INSPIRE Directive (2007/2/EC), as foreseen in the article 24? Please list the specific references.

The results of the question **Q16** integrated for Denmark and Estonia with information retrieved from the official European web-page on national transposition of the INSPIRE directive (https://eur-lex.europa.eu/legal-content/EN/NIM/?uri=CELEX:32007L0002) showed that 21 EJP SOIL countries have transposed the Directive. Norway also, although is not a Member State has transposed the directive and gave a proper reference of the transposition into a national law.
2 countries (Switzerland, and Turkey) gave a negative answer. As no Member States Switzerland and Turkey were not obliged to transpose the Directive. Despite that, for Switzerland a special law exist on geoinformation (Federal Act of 5 October 2007, https://www.fedlex.admin.ch/eli/cc/2008/388/de), more or less analogous to "INSPIRE", which consists of regulations on how to compile, transform, transfer, store, display information that have a geographical context (e.g. coordinates).

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

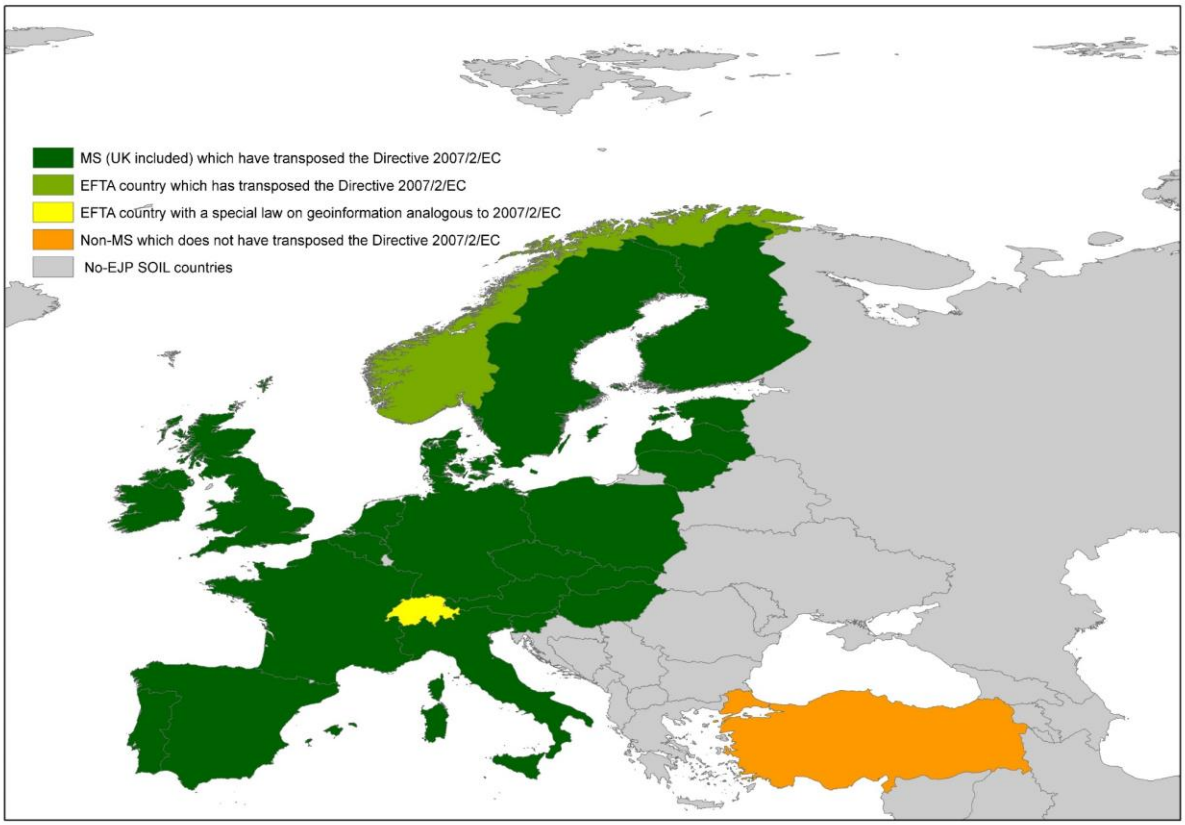

Figure 11 Transposition of the Directive 2007/2/EC in the EJP SOIL countries

The countries which have declared that they implemented the Directive have been requested to give pertinent references on the national implementation laws, which have been given. The references for Denmark, Estonia, Spain, Hungary, and Slovenia have been retrieved from the EU website. In the table 19 are reported the specific implementing national laws.

Table 19 References and links to the online version of the implementing laws of the Directive 2007/2/CE, INSPIRE

State	References and links to the online version
AT	Consolidated federal law: Entire legal provision for the Geodata Infrastructure Act, version dated June 28, 2021, https://www.ris.bka.gv.at/GeltendeFassung.wxe?Abfrage=Bundesnormen&Gesetzesnummer=20006708. https://www.inspire.gv.at/; https://inspire.ec.europa.eu/INSPIRE-in-your-Country/AT.
BE-FL	Decree concerning the Geographical Data Infrastructure Flanders (citation caption: "GDI Decree"), https://codex.vlaanderen.be/PrintDocument.ashx?id=1017838.
CZ	Act No. 123/1998 Coll., On the right to information on the environment, as amended,

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

	Act amending Act No. 123/1998 Coll., On the right to information on the environment, as amended, and Act No. 200/1994 Coll., on Surveying and on Amendments to Certain Acts Related to Its Implementation, as amended later regulations 381, https://aplikace.mvcr.cz/sbirka-zakonu/ViewFile.aspx?type=c&id=5586; On the implementation of certain provisions of the Act on the Right to Information on the Environment, https://www.mzp.cz/www/platnalegislativa.nsf/8ED4BCF74F18165EC125781E003EDEA9/%24file/V%20103_2010.pdf.
DE	Germany has a federal transposition, https://www.gdi-de.org/en/INSPIRE/legal%20implemantation: GeoZG (2009-02-14), http://www.gesetze-im-internet.de/geozg/; BayGDIG (2008-08-01), https://www.gesetze-bayern.de/Content/Document/BayGDIG; BbgGDIG (2010-04-14), https://bravors.brandenburg.de/gesetze/bbggdig; BremGeoZG (2009-12-10) https://www.transparenz.bremen.de/vorschrift_detail/bremen2014_tp.c.90241.de; HmbGDIG (2009-12-31) http://www.landesrecht-hamburg.de/jportal/portal/page/bshaprod.psml;jsessionid=2CEE1D1AFAE3D1356782733D97064367.jp22?showdoccase=1&st=lr&doc.id=jlr-GDIGHArahmen&doc.part=X&doc.origin=bs; HVGG (2010-03-17) https://www.rv.hessenrecht.hessen.de/bshe/document/jlr-VermGeoInfGHErahmen; NGDIG (2010-12-29) http://www.nds-voris.de/jportal/?quelle=jlink&query=GDIG+ND&psml=bsvorisprod.psml&max=true&aiz=true; LGDIG (2010-12-31) http://landesrecht.rlp.de/jportal/portal/t/5h3/page/bsrlpprod.psml?doc.hl=1&doc.id=jlr-GDIGRPrahmen&documentnumber=1&numberofresults=25&showdoccase=1&doc.part=R&paramfromHL=true#focuspoint; SGDIG (2009-08-28) https://recht.saarland.de/bssl/document/jlr-GDIGSLpP1; SächsGDIG (2010-06-05) https://www.recht.sachsen.de/vorschrift/11375; ThürGDIG (2009-07-31) https://landesrecht.thueringen.de/bsth/document/jlr-GeoDatInfGTH2009rahmen; LGeoZG BW (2009-12-24) https://www.landesrecht-bw.de/jportal/?quelle=jlink&query=GeoZG+BW&psml=bsbawueprod.psml&max=true&aiz=true; GeoZG Bln (2009-12-13) https://gesetze.berlin.de/bsbe/search; GeoVermG M-V (2010-12-30) https://www.landesrecht-mv.de/bsmv/document/jlr-GeoInfVermGMVrahmen; GeoZG NRW (2009-02-18) https://recht.nrw.de/lmi/owa/br_bes_text?anw_nr=2&gld_nr=7&ugl_nr=7134&bes_id=12584&menu=1&sg=0&aufgehoben=N&keyword=geozg#det0; GDIG LSA (2009-07-21) https://www.landesrecht.sachsen-anhalt.de/bsst/document/jlr-GDIGSTrahmen; GDIG GVOBl (2010-12-24) https://www.gesetze-rechtsprechung.sh.juris.de/jportal/;jsessionid=9F6EECD4453824BB947D8E7E7869F80B.jpf4?quelle=jlink&query=GeodatG+SH&psml=bsshoprod.psml&max=true&aiz=true#jlr-GeodatGSH2010rahmen.
DK	Act No 1331 of 19 December 2008 on Infrastructure for Spatial Information, Lov nr. 1331 af 19. december 2008 om infrastruktur for geografisk information, of 19/12/2008, https://www.retsinformation.dk/eli/lta/2008/1331;

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

	Order No 396 of 15 May 2009 on Infrastructure for Spatial Information, Bekendtgørelse nr. 396 af 15. maj 2009 om infrastruktur for geografisk information, of 15/05/2009, https://www.retsinformation.dk/api/pdf/130187; Order amending the Order on Infrastructure for Spatial Information, Bekendtgørelse om ændring af bekendtgørelse om infrastruktur for geografisk information, of 17/01/2014, https://www.retsinformation.dk/api/pdf/161272; Order on Infrastructure for Spatial Information in the European Union, Bekendtgørelse om infrastruktur for geografisk information i Den Europæiske Union, of 28/02/2020, https://www.retsinformation.dk/eli/lta/2020/151.
EE	PUBLIC INFORMATION ACT, AVALIKU TEABE SEADUS, RT I 2000, 92, 597, https://www.riigiteataja.ee/akt/26643; ENVIRONMENTAL REGISTER ACT, KESKKONNAREGISTRI SEADUS, RT I 2002, 58, 361, https://www.riigiteataja.ee/akt/179306; SITE MANAGEMENT, KOHANIMESEADUS, RT I 2003, 73, 485, https://www.riigiteataja.ee/akt/672390; Geodetic system, Geodeetiline süsteem, RTL, 10.07.2008, 57, 789, https://www.riigiteataja.ee/akt/12987975; Spatial Data Act1, Ruumiandmete seadus1, RT I, 28.02.2011, 2, https://www.riigiteataja.ee/akt/128022011002; Act amending the Spatial Data Act, Ruumiandmete seaduse muutmise seadus, RT I, 08.07.2014, 14, https://www.riigiteataja.ee/akt/108072014014.
ES	Law 14/2010, of 5 July, on geographical information infrastructures and services in Spain/Law 14 of 2010, Ley 14/2010, de 5 de julio, sobre las infraestructuras y los servicios de información geográfica en España, Official publication: Boletín Oficial del Estado (B.O.E); Number: 163/2010. https://www.boe.es/buscar/act.php?id=BOE-A-2010-10707; Law 2/2018, of 23 May, amending Law 14/2010 of 5 July on geographical information infrastructures and services in Spain./Ley 2/2018, de 23 de mayo, por la que se modifica la Ley 14/2010, de 5 de julio, sobre las infraestructuras y los servicios de información geográfica en España. Official publication: Boletín Oficial del Estado (B.O.E); Number: 126/2018 https://eur-lex.europa.eu/legal-content/ES/TXT/PDF/?uri=NIM:259049
FI	Spatial Data Infrastructure Act (421/2009), 12.6.2009/421, Laki paikkatietoinfrastruktuurista (421/2009), https://www.finlex.fi/fi/laki/alkup/2009/20090421; Amendment to the Spatial Data Infrastructure Act (1502/2015), 17.12.2015/1502, Muutos lakiin paikkatietoinfrastruktuurista (1502/2015) https://www.finlex.fi/fi/laki/alkup/2015/20151502; Infrastructure for Spatial Information in the European Region (725/2009), 1.10.2009/725, Asetus paikkatietoinfrastruktuurista (725/2009) https://www.finlex.fi/fi/laki/alkup/2009/20090725; Amendment to the Regulation on the Infrastructure for Spatial Information in the European Region (1282/2009), 22.12.2009/1282, Muutos asetukseen paikkatietoinfrastruktuurista (1282/2009) https://www.finlex.fi/fi/laki/alkup/2009/20091282; Amendment to the Regulation on the Infrastructure for Spatial Information in the European Region (922/2014), 6.11.2014/922, Muutos asetukseen paikkatietoinfrastruktuurista, (922/2014), https://www.finlex.fi/fi/laki/alkup/2014/20140922.
FR	LAW n ° 2009-526 of 12 May 2009 on the simplification and clarification of the law and the streamlining of procedures (1), LOI n°2009-526 du 12 mai 2009, v. init., https://www.legifrance.gouv.fr/loda/id/JORFTEXT000020604162/; Ordinance No. 2010-1232

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

	of October 21, 2010 on various provisions for adaptation to European Union law on the environment, https://www.legifrance.gouv.fr/loda/id/JORFTEXT000022934766/; Decree No. 2011-127 of January 31, 2011 relating to the National Council for Geographic Information, https://www.legifrance.gouv.fr/loda/id/JORFTEXT000023492390/; Order of January 24, 2011 setting the earthquake-resistant rules applicable to certain classified installations, https://www.legifrance.gouv.fr/loda/id/JORFTEXT000023791676/; Decree No. 2011-223 of March 1, 2011 issued for the application of Article L. 127-10 of the Environment Code, https://www.legifrance.gouv.fr/loda/id/JORFTEXT000023650909/; Decree No. 2011-494 of May 5, 2011 taken in application of Articles L. 127-8 and L. 127-9 of the Environment Code, https://www.legifrance.gouv.fr/jorf/id/JORFTEXT000023950641; Order of December 31, 2020 approving the national biodiversity data scheme, https://www.legifrance.gouv.fr/jorf/id/JORFTEXT000043038593.
HU	1995. LIII. Act on General Rules for the Protection of the Environment, http://extwprlegs1.fao.org/docs/pdf/hun6567.pdf; 2001 LXXXI. Act promulgating the Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters, adopted in Aarhus on 25 June 1998, https://net.jogtar.hu/jogszabaly?docid=a0100081.tv; 2008 XCI. Act LIII of 1995 on the general rules for the protection of the environment. Act LIII of 1996 on the protection of nature. amending this Act and other laws, https://mkogy.jogtar.hu/jogszabaly?docid=a0800091.TV; Government Decree 241/2009. (X. 29.) on the establishment and operation of the National Environmental GIS System, https://net.jogtar.hu/jogszabaly?docid=a0900241.kor; 2011 CXII. Act on the Right to Information Self-Determination and Freedom of Information, https://net.jogtar.hu/jogszabaly?docid=a1100112.tv.
IE	S.I. No. 382/2010 - European Communities (Establishing an Infrastructure for Spatial Information in the European Community (INSPIRE)) Regulations, 2010, http://www.irishstatutebook.ie/eli/2010/si/382/made/en/print; S.I. No. 280/2018 - European Communities (Establishing an Infrastructure for Spatial Information in the European Community (INSPIRE)) (Amendment) Regulations 2018, http://www.irishstatutebook.ie/eli/2018/si/280/made/en/print.
IT	Implementation of Directive 2007/2/EC establishing an Infrastructure for Spatial Information in the European Community (INSPIRE), DECRETO LEGISLATIVO 27 gennaio 2010, n. 32, DECRETO LEGISLATIVO 27 gennaio 2010, n. 32, https://www.minambiente.it/sites/default/files/dlgs_27_01_2010_32.pdf.
LT	Law on Geodesy and Mapping of the Republic of Lithuania of 28 June 2001 No IX-415 with subsequent additions to implement INSPIRE Directive 2007/2/EC; Lietuvos Respublikos geodezijos ir kartografijos įstatymas, Valstybės žinios, 2001-07-18, Nr. 62-2226, https://e-seimas.lrs.lt/portal/legalAct/lt/TAD/TAIS.143068/asr.
LV	Geospatial Information Law (13.01.2010), https://likumi.lv/ta/id/202999-geotelpiskas-informacijas-likums.
NL	Implementation Act EC Directive Infrastructure Spatial Information, Implementatiewet EG-richtlijn infrastructuur ruimtelijke informatie, https://wetten.overheid.nl/BWBR0026158/2009-09-01.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

NO	Spatial data act regulations, https://lovdata.no/dokument/SF/forskrift/2012-08-08-797?q=geodatalov
PL	Dz.U. 2010 nr 76 poz. 489, Act of March 4, 2010 on spatial information infrastructure, http://isap.sejm.gov.pl/isap.nsf/DocDetails.xsp?id=wdu20100760489.
PT	Decree-Law no. 180/2009, of August 7, in the wording given by Decree-Law No. 29/2017, of March 16 (not exclusive to soil data), decreto-Lei n. º180/2009, de 7 de agosto, na redação dada pelo Decreto-Lei n.º 29/2017, de 16 de março (not exclusive to soil data), https://dre.pt/home/-/dre/106616122/details/maximized. Decreto-Lei n.º 84/2015, Changes the composition of the SNIG Guidance Council (CO-SNIG) defined in DL 180/2009, decreto-Lei n.º 84/2015, Changes the composition of the SNIG Guidance Council (CO-SNIG) defined in DL 180/2009, https://dre.pt/home/-/dre/67250268/details/maximized. Decreto-Lei n.º 29/2017, Decree-Law No. 29/2017, Amends DL No. 180/2009 with the objective of filling the gaps and deficiencies verified by the European Commission in the transposition of the INSPIRE Directive as well as improving the functioning of the SNIG and the implementation of the INSPIRE Directive in Portugal, https://dre.pt/home/-/dre/106616122/details/maximized.
SE	Law (2010: 1767) on geographical environmental information, 2010-12-03, Lag (2010:1767) om geografisk miljöinformation, 2010-12-03, https://www.riksdagen.se/sv/dokument-lagar/dokument/svensk-forfattningssamling/lag-20101767-om-geografisk-miljoinformation_sfs-2010-1767; Ordinance (2010: 1770) on geographical environmental information, 2010-12-03, Förordning (2010:1770) om geografisk miljöinformation, 2010-12-03, https://www.riksdagen.se/sv/dokument-lagar/dokument/svensk-forfattningssamling/forordning-20101770-om-geografisk_sfs-2010-1770.
SI	Spatial Information Infrastructure Act (ZIPI), http://www.pisrs.si/Pis.web/pregledPredpisa?id=ZAKO5657.
SK	Act no. 3/2010 Coll. on the National Infrastructure for Spatial Information, as amended, https://www.slov-lex.sk/pravne-predpisy/SK/ZZ/2010/3/20160501.
UK	The INSPIRE Regulations 2009, n° 3157, https://www.legislation.gov.uk/uksi/2009/3157/contents/made; The INSPIRE (Scotland) Regulations 2009, n° 440, https://www.legislation.gov.uk/ssi/2009/440/contents/made; The INSPIRE (Amendment) (EU Exit) Regulations 2018, n° 1338, https://www.legislation.gov.uk/uksi/2018/1338/contents/made; The INSPIRE (Amendment) (EU Exit) Regulations 2019, n° 103, https://www.legislation.gov.uk/uksi/2019/1352/made.

The question **Q17** aimed at verifying whether an English version of the transposition laws was available. Only 2 non-English-speaking countries gave a positive answer to this question: Latvia and Norway. Adding UK and Ireland the countries offering English versions of the transposition laws at national level are 4. All the other countries declared that an English version of the transposition laws was not available.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

The countries which opted for a positive answer to **Q17**, were requested to give pertinent references to the English version of the transposition laws. The table 20 shows the results.

Table 20 References and links to the English version of the implementing laws of the Directive 2007/2/CE, INSPIRE

State	References and links to the online version
IE	http://www.irishstatutebook.ie/eli/2010/si/382/made/en/print. http://www.irishstatutebook.ie/eli/2018/si/280/made/en/print.
LT	Geospatial Information Law, english version, https://likumi.lv/ta/en/en/id/202999.
NO	Spatial data act - https://www.regjeringen.no/en/dokumenter/spatial-data-act/id613612/.
UK	https://www.legislation.gov.uk/uksi/2009/3157/contents/made.

The final question of this section (**Q18**) was devoted to investigating whether other provisions, such as other laws or regulations and administrative provisions, have been brought into force by a single State to comply with the Directive (2007/2/CE). Countries could give "none" as an answer.

Spain, Hungary, and Slovenia answered "none". Belgium, Czech Republic, Germany, France, Ireland, Netherlands, Norway, Poland, and UK gave the same references as well as to the question **Q16**. These countries reaffirmed explicitly that such provisions are the solely that have been brought into force in order to ensure compliance to the INSPIRE Directive. Finland answered to this question giving the reference of a national list of spatial data sets covered by the INSPIRE Directive. Turkey indicated that the Ministry of Environment and Urbanization is working on the subjects and has cited two INSPIRE Reports of 2007 and 2010. Switzerland gave more references to the special law on geoinformation (https://www.fedlex.admin.ch/eli/cc/2008/388/de), which consists of regulations on how to compile, transform, transfer, store, display information that have a geographical context (e.g. coordinates): (https://www.swisstopo.admin.ch/de/swisstopo/organisation/kogis.html for information on the Swiss Federal level, and https://www.kkgeo.ch/ for information on the cantonal level) which ar related to the geoinformation maintained mainly by the GIS services on federal and cantonal level. The remaining countries gave further references which are reported in the table 21.

Table 21 Reference and link to other laws, administrative provisions and regulation to comply with the Directive 2007/2/CE, INSPIRE

State	References and links to the online version
AT	Consolidated federal law: Entire legal provision for the Geodata Infrastructure Act, version dated June 28, 2021, https://www.ris.bka.gv.at/GeltendeFassung.wxe?Abfrage=Bundesnormen&Gesetzesnummer=20006708. Soil protection is in the responsibility of the provinces – each federal province has its own regulation, some of them soil protection laws. For adequate information

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

	responsible authorities have to be involved. Federal states implementations can be found in the EU official site: https://eur-lex.europa.eu/legal-content/EN/NIM/?uri=CELEX:32007L0002.
FI	National inventory, https://www.maanmittauslaitos.fi/kartat-ja-paikkatieto/paikkatietojen-yhteentoimivuus/inspire/kansallinen-aineistoluettelo.
IT	Organization regulations of the Ministry of the Environment and Land and Sea Protection, of the Independent Performance Assessment Body and of the Offices of direct collaboration, DECRETO DEL PRESIDENTE DEL CONSIGLIO DEI MINISTRI 19 Giugno 2019, n. 97, https://www.gazzettaufficiale.it/eli/id/2019/08/28/19G00106/sg; Organization regulations of the Ministry of the environment and the protection of the territory and sea, DECRETO DEL PRESIDENTE DEL CONSIGLIO DEI MINISTRI 6 Novembre 2019, n. 138, https://www.gazzettaufficiale.it/eli/id/2019/12/02/19G00144/sg.
LT	Governments of the Republic of Lithuania, 2008 September 10 Resolution no. 911 “On the 2007 March 14 Approval of the plan of measures for the transposition of Directive 2007/2 / EC of the European Parliament and of the Council establishing an Infrastructure for Spatial Information in the European Community (INSPIRE) and designation of the responsible authorities", Lietuvos Respublikos vyraiusybės 2008 m. rugsėjo 10 d. nutarimas Nr. 911 “Dėl 2007 m. kovo 14 d. Europos Parlamento ir Tarybos direktyvos 2007/2/EB, sukuriančios Europos Bendrijos erdvinės informacijos infrastruktūrą (INSPIRE), perkėlimo priemonių plano patvirtinimo ir atsakingų institucijų paskyrimo”, https://e-seimas.lrs.lt/portal/legalAct/lt/TAD/TAIS.327371/asr; Governments of the Republic of Lithuania in 2013 February 27 Resolution no. 180 “On the Approval of the Description of the Procedure for the Establishment, Development, Modernization and Liquidation of State Information Systems”, Lietuvos Respublikos vyraiusybės 2013 m. vasario 27 d. nutarimas Nr. 180 „Dėl Valstybės informacinių sistemų steigimo, kūrimo, modernizavimo ir likvidavimo tvarkos aprašo patvirtinimo”, https://e-seimas.lrs.lt/portal/legalAct/lt/TAD/TAIS.443707/asr; Minister of Agriculture of the Republic of Lithuania 2018 June 1 order no. 3D-350 “On Approval of the Regulations of the Lithuanian Spatial Information Portal and the Data Security Regulations of the Lithuanian Spatial Information Portal”, TAR, 4 June 2018, No. 9120, Lietuvos Respublikos žemės ūkio ministro 2018 m. birželio 1 d. įsakymas Nr. 3D-350 „Dėl Lietuvos erdvinės informacijos portalo nuostatų ir Lietuvos erdvinės informacijos portalo duomenų saugos nuostatų patvirtinimo”, TAR, 2018-06-04, Nr. 9120, https://e-seimas.lrs.lt/portal/legalAct/lt/TAD/1162ebc1682e11e8b7d2b2d2ca774092?jfwid=rivwzvpvg; Lietuvos Respublikos geodezijos ir kartografijos įstatymas, Valstybės žinios, 2001-07-18, Nr. 62-2226, Lietuvos Respublikos geodezijos ir kartografijos įstatymas, Valstybės žinios, 2001-07-18, Nr. 62-2226, https://e-seimas.lrs.lt/portal/legalAct/lt/TAD/TAIS.143068/asr; Government of the Republic of Lithuania 2013 March 13 Resolution “On the Establishment of the Georeferenced Basis Cadastre, Approval of Its Provisions and Determination of the Commencement of Operation”, Lietuvos Respublikos vyriausybės 2013 m. kovo 13 d. nutarimas „Dėl Georeferencinio pagrindo kadastro steigimo, jo nuostatų patvirtinimo ir veikimo pradžios nustatymo“, Valstybės žinios, 2013-03-20, Nr. 29-1395, https://e-seimas.lrs.lt/portal/legalAct/lt/TAD/TAIS.444488/asr.
LV	Geospatial Information Law (17.12.2009) in english, http://extwprlegs1.fao.org/docs/pdf/lat182059.pdf; Republic of Latvia Cabinet Regulation

This project has received funding from the European Union’s Horizon 2020 research and innovation programme under grant agreement N° 862695

	No.668. Regulations Regarding the State Uniform Geospatial Information Portal (30.08.2011), https://likumi.lv/ta/id/235212-valsts-vienota-geotelpiskas-informacijas-portala-noteikumi (also in the english version) https://likumi.lv/ta/en/en/id/235212-regulations-regarding-the-state-uniform-geospatial-information-portal; Republic of Latvia Cabinet Regulation No.211 Regulations Regarding the Mandatory Content of Metadata of Geospatial Data Sets (22.03.2011), https://likumi.lv/ta/id/227704-noteikumi-par-geotelpisko-datu-kopu-metadatu-obligato-saturu (also in the english version) https://likumi.lv/ta/en/en/id/227704; Republic of Latvia Cabinet Regulation No.673. Mandatory Content of the Provisions for the Use of a Geospatial Data Set and Procedures for the Receipt of a Permit for the Use (30.08.2011), https://inspire.ec.europa.eu/sites/default/files/inspire_-_latvia_-_2020_country_fiche.pdf.
PT	Regulamento nº 142/2016, de 9 de Fevereiro, Regulation of the Standards and Technical Specifications for topographic and topographic image mapping to be used in the preparation, alteration or revision of territorial plans and thematic cartography, https://dre.pt/home/-/dre/73448643/details/2/maximized?serie=II&dreId=73448609.
SE	Strategy for environmental data management, Strategi för miljödatahantering, https://www.naturvardsverket.se/strategi-for-miljodatahantering#, https://www.lantmateriet.se/sv/webb/nationell-geodatastrategi/; SIS-TS 80:2018 Geographic information – National metadata profile for geographic information, https://www.sis.se/en/produkter/information-technology-office-machines/applications-of-information-technology/it-applications-in-science/sis-ts-802018/.
SK	Act 215/1995 on geodesy and cartography, as amended, https://www.slov-lex.sk/pravne-predpisy/SK/ZZ/1995/215/20191001; Act 137/2010 on air, as amended,https://www.slov-lex.sk/pravne-predpisy/SK/ZZ/2010/137/20200409; Act 317/2012 on Intelligent Transport Systems in Road Transport and on Amendments to Certain Acts, https://www.slov-lex.sk/pravne-predpisy/SK/ZZ/2012/317/20130119; Act 125/2015 on the Register of Addresses and on Amendments to Certain Acts, https://www.slov-lex.sk/pravne-predpisy/SK/ZZ/2015/125/20150701; Act 135/1961 on Roads (Road Act) https://www.slov-lex.sk/pravne-predpisy/SK/ZZ/1961/135/20210601; Act 150/2019 on the prevention and management of the introduction and spread of invasive alien species and on the amendment of certain laws, https://www.slov-lex.sk/pravne-predpisy/SK/ZZ/2019/150/20190801; Act 162/1995 on the Real Estate Cadastre and on the Registration of Ownership and Other Rights to Real Estate (Cadastral Act), as amended, https://www.slov-lex.sk/pravne-predpisy/SK/ZZ/1995/162/20191001; Act 39/2013 on integrated prevention and control of environmental pollution and on amendments to certain laws, https://www.slov-lex.sk/pravne-predpisy/SK/ZZ/2013/39/20210206.

3.2.1 Results of the analysis of the section B

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

RESULTS IN A NUTSHELL

As to the Implementation of the Directive 2007/2/CE, INSPIRE, the following barriers emerged:

- lack of implementing provisions in Turkey since it is not a Member State;
- fragmented domestic frameworks with different national laws and provisions in most of the countries investigated;
- lack of an English version of national implementation law/provision in most of the countries investigated.

These barriers can be overcome by actions undertaken by the EJP SOIL countries at national level, which will be facilitated by the EJP SOIL programme, aimed at :

- encouraging Turkey, although it is not a MS, to implement the INSPIRE Directive;
- consolidating the implementation laws and provision in a unique domestic legal law;
- providing, at least, an official brief summary of the implementation in English and rendering it available online.

In particular, the EJP SOIL will facilitate this process through the organisation of national policy forums and national meetings with soil data holders, owners, and expert groups and all the key stakeholders dealing with soil data management and soil reporting at national level. These activities will be performed in collaboration between WP6, WP8, and WP9, also coordinating with the European Environment Agency, the Joint Research Center, and the European Soil Partnership.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

3.3 METADATA ON SOIL INFORMATION (Section C)

This section aims at acquiring relevant information on the state of implementation of the Directive 2007/2/EC, INSPIRE, in relation to metadata on soil information. According to Recital (15) of the Inspire Directive "the loss of time and resources in searching for existing spatial data or establishing whether they may be used for a particular purpose is a key obstacle to the full exploitation of the data available. Member States should therefore provide descriptions of available spatial data sets and services in the form of metadata". Article 5 of the same Directive also highlights that "Member States shall ensure that metadata are created for the spatial data sets and services corresponding to the themes listed in Annexes I, II and III, and that those metadata are kept up to date[19]". Soil is listed as theme under the Annex III.

In particular, section 2 of article 5 describes more specifically the information that metadata shall include:

- the conformity of spatial data sets with the implementing rules provided for in Article 7 (1)[20];
- conditions applying to access to, and use of, spatial datasets and services and, where applicable, corresponding fees;
- the quality and validity of spatial data sets;
- the public authorities responsible for the establishment, management, maintenance and distribution of spatial data sets and services;
- limitations on public access and the reasons for such limitations, in accordance with Article 13.

Section 3 of the same article concludes that Member States shall take the necessary measures to ensure that metadata are complete and of a quality sufficient to fulfil the purpose set out in point (6) of Article 3[21].

In such a context, the first slot of questions (**Q19** and **Q20**) aimed at investigating whether participants to the survey, which are responsible at national or local level of the spatial data sets and services, publish metadata. The questions were the following:

> **Q19**. Is your national soil information service (official or not) publishing the metadata of the spatial data sets and services for which it is responsible ? If yes to question 19, please put a reference.

[19] Annex I, II and III of the Directive 2007/2/EC are available in the Annex II of this Deliverable

[20] Art. 7 (1): " Implementing rules laying down technical arrangements for the interoperability and, where practicable, harmonisation of spatial data sets and services, designed to amend non-essential elements of this Directive by supplementing it, shall be adopted in accordance with the regulatory procedure with scrutiny referred to in Article 22(3). Relevant user requirements, existing initiatives and international standards for the harmonisation of spatial data sets, as well as feasibility and cost-benefit considerations shall be taken into account in the development of the implementing rules. Where organisations established under international law have adopted relevant standards to ensure interoperability or harmonisation of spatial data sets and services, these standards shall be integrated, and the existing technical means shall be referred to, if appropriate, in the implementing rules mentioned in this paragraph".

[21] Art. 3 (6): "metadata means information describing spatial data sets and spatial data services and making it possible to discover, inventory and use them"

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

Q20. Are the regional/federal-state soil information services (official or not) publishing the metadata of the spatial data sets and services for which they are responsible? If yes to the question 19, please put a reference.

In relation to the first question (**Q19**) results demonstrate (figure 12) that the majority of participants have a national soil information service (officials or not) which publishes the metadata of spatial data sets and services for which it is responsible. Turkey and Belgium answered negatively, which is not strange, since they do not have a national soil information service.

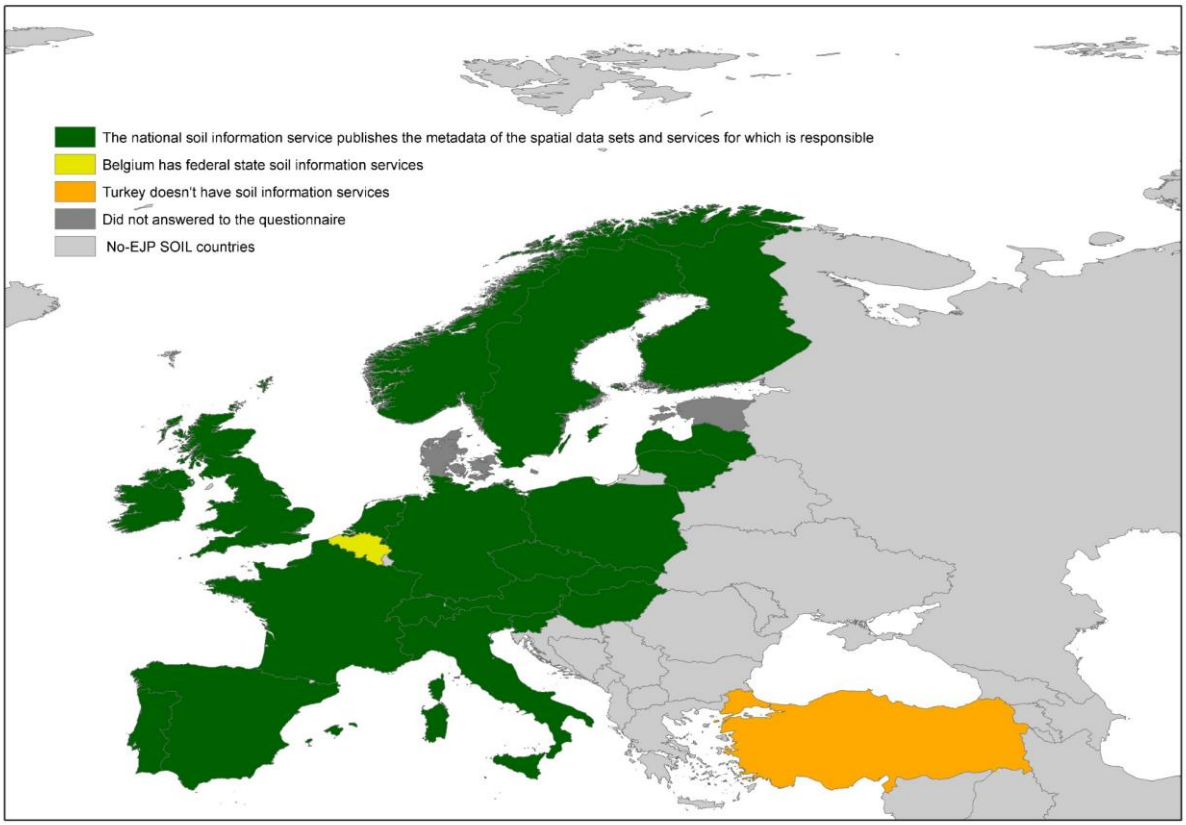

Figure 12 On metadata public repositories of national soil information services

All the positive respondents countries gave pertinent references, but the metadata catalog of spatial datasets for Hungary currently doesn't work, because the responsible Institution has ceased to exist on 1st of January 2017. The table 22 shows the results.

Table 22 References to the metadata publishing services at national level

State	References to the metadata publishing services at national level
AT	https://www.inspire.gv.at
CH	The metadata for the environmental information uploaded in the Swiss portal (https://map.geo.admin.ch/) are available for each data source, but there is not a metadata catalogue. The following publication on Swiss soil information system is available :

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

	https://www.nabodat.ch/images/dokumente/Bodendatensatz/DOKUMENTATION_V5_2020_EN.pdf
CZ	https://metadata.vumop.cz/
DE	https://produktcenter.bgr.de.
ES	Spain has a metadata catalog to search for environmental data and services (https://www.idee.es/) which does not list soil among the categories of published INSPIRE themes (https://www.idee.es/csw-inspire-idee/srv/ita/catalog.search#/home). Despite that, some soil geographic datasets are available searching for soil in the metadata catalog.
FI	The Finnish Environment Institute publishes a metadata service (https://ckan.ymparisto.fi/) and a list of map services (https://www.syke.fi/fi-FI/Avoin_tieto/Karttapalvelut). Among these, there is also the "Soil status information system MATTI" of Finland, accompanied by its respective metadata (https://ckan.ymparisto.fi/dataset/maaperan-tilan-tietojarjestelma-matti), and the Finnish land database (Suomen maannostietokanta) produced by LUKE, which contains national data on soils, land landscapes and subsoil areas (https://ckan.ymparisto.fi/dataset/suomen-maannostietokanta).
FR	https://agroenvgeo.data.inra.fr/geonetwork/srv/ita/catalog.search#/home
HU	The institutions responsible for soil data at national level are also responsible for the respective metadata : National Food Chain Safety Office; Directorate of Plant Protection (http://www.escaa.org/index/action/page/id/6/title/agency-by-country/country/HU) Soil Conservation and Agri – Environment (https://portal.nebih.gov.hu/hu/web/english/hungarian-forest-management/-/asset_publisher/pHBk9pq6UNxK/content/directorate-of-plant-protection-and-soil-conservation/contacts). The metadata catalogue of spatial datasets for Hungary currently doesn't work, because the responsible Institution has ceased to exist on 1st of January 2017. Here some further explanations. The National Contact Point for the INSPIRE implementation in Hungary is the Ministry for Agriculture and Rural Development (https://2015-2019.kormany.hu/en/ministry-of-agriculture) with the support of the Institute of Geodesy, Cartography and Remote Sensing (http://www.ftf.bfkh.gov.hu/portal/index.php/kezdoldal). It is specified in the web-site of the Institute of Geodesy, Cartography, and Remote Sensing that "according to the Hungarian Government's decision[22] the Institute of Geodesy Cartography and Remote Sensing (FÖMI) by legal succession – with the legal integration into the Government Office of the Capital City Budapest – ceased to exist on 1st of January 2017. From 1st of January 2017, FÖMI continues its professional activities as the Department of Geodesy, Remote Sensing and Land Offices, under the Government Office of the Capital City Budapest."
IE	https://inspire.geohive.ie/geoportal/#searchPanel
IT	The Ministry of Environment is publishing metadata at the web-site: http://www.pcn.minambiente.it/mattm/catalogo-metadati/

[22] *Hungarian Governmental Decree No. 1312/2016. (13. June) and the Governmental Regulation No. 378/2016, 24 §. (2. December) concerning the succession connected to the review of some central offices and ministerial background institutions operated as budgetary authorities and the takeover of some public tasks.*

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

	SINANET publishes metadata on Land use, land cover, land consumption data: http://groupware.sinanet.isprambiente.it/uso-copertura-e-consumo-di-suolo.
LT	National Land Service under the Ministry of Agriculture; https://www.geoportal.lt/geoportal/web/en; https://zis.lt/en/duomenys/
LV	https://geolatvija.lv/geo/#/
NL	National geo register, www.nationaalgeoregister.nl: Open data of the government, https://data.overheid.nl/en
NO	National spatial data infrastructure (Geonorge) map catalogue https://kartkatalog.geonorge.no/?text=soil
PL	Poland has a metadata catalogue (https://dane.gov.pl/pl/dataset) managed by the Service of the Republic of Poland (Serwis Rzeczypospolitej Polskiej). Searching for soil (gleb in polish) the searching result is the "State Environmental Monitoring - monitoring of the chemistry of Poland's arable soils" (https://www.gios.gov.pl/chemizm_gleb/index.php?mod=metodyka). For this dataset the metadata are given. The institution responsible for this soil monitoring activity are : IUNG, the Chief Inspectorate for Environmental Protection (https://www.gios.gov.pl/pl/), and the National Fund for Environmental Protection and Water Management (http://www.nfosigw.gov.pl/).
PT	https://snig.dgterritorio.gov.pt/rndg/srv/por/catalog.search#/home
SE	https://www.geodata.se/geodataportalen/
SI	https://eprostor.gov.si/imps/srv/slv/catalog.search#/home
SK	Metadata for spatial data and services are published via Spatial data registry, https://rpi.gov.sk/client/map/records/?anytext=https://data.gov.sk/set/rpi/gmd/42337402
UK	https://ckan.publishing.service.gov.uk/dataset; https://data.gov.uk/dataset/ea1442bf-ba77-42cc-80e7-2ea339ccb28a/natmap-national-soil-map; https://data.gov.uk/dataset/7ea11e13-23db-4174-9dba-b1b635704051/afbi-soil-series-map-of-northern-ireland-metadata; https://data.gov.uk/dataset/6c3dfc6f-98c8-48c6-ae66-2e4c20ed26c9/national-soil-map-of-scotland

As for the second question (**Q20**), aiming at verifying whether soil information services at regional/federal-state publish the metadata of the spatial data sets and services for which they are responsible, results showed that participating countries are balanced (figure 13): 11 of them answered positively (Belgium, Switzerland, Germany, France, Hungary, Ireland, Italy, Netherlands, Norway, Portugal, and UK) to the question and 11 negatively (Austria, Czech Republic, Spain, Finland, Lithuania, Latvia, Poland, Portugal, Sweden, Slovenia, Slovakia, and Turkey).

Of the 10 countries answering positively, 9 have regional/federal-state soil information services (Belgium, Switzerland, Germany, Hungary, Ireland, Italy, Netherlands, Norway, and UK). France, which do not have regional soil information services, publish in the national metadata repository the metadata of regional spatial data sets, and gave pertinent links for them. Hungary did not give a link to metadata, but of responsible institutions. Norway and the Netherlands did not give any link. Switzerland specified that most of the cantonal data is compiled within the national soil data set. Moreover, many cantons publish their data, and maps separately on their respective websites/gis map

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

servers. No link has been given by Switzerland. All the other countries gave links to online repositories which are reported in the table 23.

Of the 11 countries answering negatively, 10 do not have regional/federal-state soil information services (Slovenia, Spain, Czech Republic, Finland, Latvia, Sweden, Austria, Slovakia, Turkey, and Poland). Lithuania have regional soil services which do not publish the metadata for their datasets in the national portals.

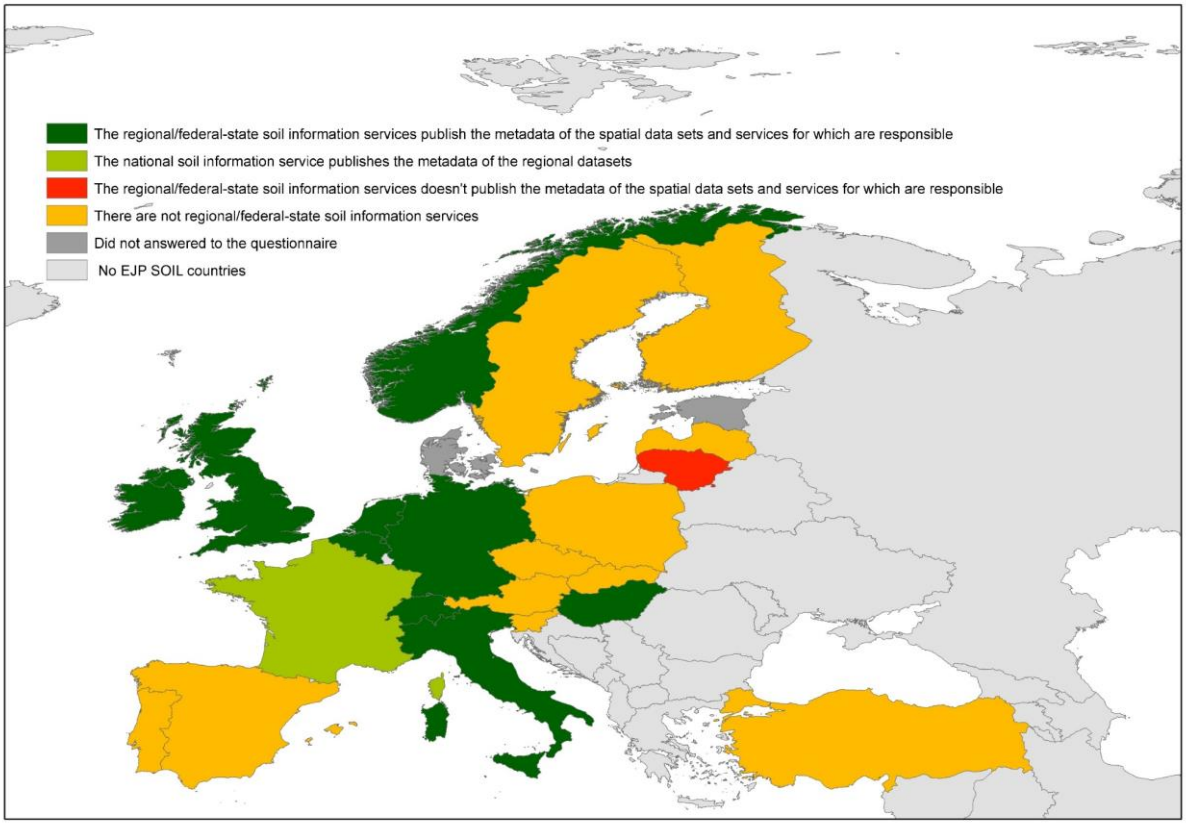

Figure 13 On metadata public repositories of regional/federal-state soil information services

Table 23 References to the metadata publishing services at regional level

State	References to the metadata publishing services at regional level
BE-FL	https://www.dov.vlaanderen.be/geonetwork/srv/dut/catalog.search#/home
CH	Most of the cantonal data is compiled within the national soil data set. Therefore, see question 19. Many cantons publish their data, maps etc. separately on their respective websites/gis map servers.
DE	Several regional soil services are publishing metadata, but not all. https://gdk.gdi-de.org/gdi-de/srv/ger/catalog.search#/search?
FR	Not for all the regions:

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

	1) Departments with web sites having Inspire metadata : 45, 33, 10, 52, 08, 51, 40 https://agroenvgeo.data.inra.fr/geonetwork/srv/fre/catalog.search#/search?facet.q=orgName%2FINRA%2520InfoSol%26status%2Fcompleted&resultType=details&fast=index&_content_type=json&from=1&to=20&sortBy=relevance; 64, 24, 47 https://portail.pigma.org/; 87, 23, 19 https://www.sigena.fr/geonetwork/srv/fre/catalog.search#/home; 56,29, 22, 35 https://agroenvgeo.data.inra.fr/geonetwork/srv/fre/catalog.search#/search?facet.q=sourceCatalog%2F4f653945-8689-43b9-aa7f-738a5768eadf&resultType=details&sortBy=relevance&any=sol&fast=index&_content_type=json&from=1&to=20; 11, 34,66, 30, 43 www.openig.org; 27, 76 https://www.geonormandie.fr/geonetwork/srv/fre/catalog.search#/home; 67, 68 https://www.geograndest.fr/geonetwork/srv/fre/catalog.search#/search?facet.q=sourceCatalog%2F6a7b2629-8b79-48c9-922d-1c3cbd5cb75b&resultType=details&sortBy=relevance&from=1&to=20. 2) Departments with web sites having no Inspire metadata: 31, 09, 32,65, 46 https://www4.obs-mip.fr/rrp-midi-pyrenees/; 81 https://tarn.chambre-agriculture.fr/agroenvironnement/agroecologie/agriculture-de-conservation/ressources/observer-le-sol/carte-des-sols-du-tarn-2016/; 21, 58, 71, 89 https://solsdebourgogne.fr/; 01, 07, 26, 38, 42, 69, 73, 74 http://rhone-alpes.websol.fr/.
HU	The institutions responsible for soil data at regional level (County soil conservation officers run by County Governmental Offices) are also responsible for the respective metadata , with the support of the National Food Chain Safety Office; Directorate of Plant Protection (http://www.escaa.org/index/action/page/id/6/title/agency-by-country/country/HU), and of the Soil Conservation and Agri – Environment (https://portal.nebih.gov.hu/hu/web/english/hungarian-forest-management/-/asset_publisher/pHBk9pq6UNxK/content/directorate-of-plant-protection-and-soil-conservation/contacts). Currently a metadata catalogue of spatial datasets for Hungary is not available. The National Contact Point for the INSPIRE implementation in Hungary is the Ministry for Agriculture and Rural Development (https://2015-2019.kormany.hu/en/ministry-of-agriculture) with the support of the Institute of Geodesy, Cartography and Remote Sensing (http://www.ftf.bfkh.gov.hu/portal/index.php/kezdoldal). It is specified in the web-site of the Institute of Geodesy, Cartography, and Remote Sensing that "according to the Hungarian Government's decision the Institute of Geodesy Cartography and Remote Sensing (FÖMI) by legal succession – with the legal integration into the Government Office of the Capital City Budapest – ceased to exist on 1st of January 2017. From 1st of January 2017, FÖMI continues its professional activities as the Department of Geodesy, Remote Sensing and Land Offices, under the Government Office of the Capital City Budapest."
IE	https://inspire.geohive.ie/geoportal/#searchPanel
IT	These are the publishing services of the only 2 regions which answered to the questionnaire :

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

	http://www.geoportale.regione.lombardia.it/ http://www.lamma.rete.toscana.it/territorio/cartografia-tematica/pedologia
LT	National Land Service under the Ministry of Agriculture; https://www.geoportal.lt/geoportal/web/en; https://zis.lt/en/duomenys/.
PT	https://snig.dgterritorio.gov.pt/rndg/srv/por/catalog.search#/home https://snig.dgterritorio.gov.pt/saber-mais/outras-iig/iig-regionais
UK	https://data.gov.uk/dataset/ea1442bf-ba77-42cc-80e7-2ea339ccb28a/natmap-national-soil-map. https://data.gov.uk/dataset/7ea11e13-23db-4174-9dba-b1b635704051/afbi-soil-series-map-of-northern-ireland-metadata. https://data.gov.uk/dataset/6c3dfc6f-98c8-48c6-ae66-2e4c20ed26c9/national-soil-map-of-scotland. https://inspire.spatialni.gov.uk/geoportal/catalog/search/search.page.

In relation to the Q19 and Q20 we made some internet researches to integrate the information for Denmark and Estonia, which did not answered to the questionnaire. To integrate incomplete or null answers we found very useful, as a starting point, the official EU page on the status of INSPIRE implementation at the year 2016 : https://inspire.ec.europa.eu/portfolio/inspire-your-country.

For Denmark we verified the existence of a functioning metadata repository (https://www.geodata-info.dk/srv/dan/catalog.search#/home). Searching for soil dataset in this repository we found 4 datasets retrieved from a publication of the Danish Forest and Nature Agency. This Agency and the Ministry of the Environment's environmental centers have been assigned tasks and powers for the protection of environmental resources with an Executive Order (BEK nr 1746 af 17/12/2006, https://www.retsinformation.dk/eli/lta/2006/1746). The Ministry of the Environment and the Danish Nature Agency own a geoportal named 'State groundwater mapping' (https://miljoegis.mim.dk/cbkort?&profile=grundvand) where they publish maps of soil filtering function in relation to groundwater. Therefore we can argue that they are the national and regional soil officers, and that they publish metadata of the soil datasets they owned, but we cannot affirm this. In the INSPIRE geoportal only a national scale soil related dataset is available, with no clear indication of the data owner, which is not viewable, nor downloadable. Finally a Danish Environmental Portal exists (https://www.miljoeportal.dk/).

For Estonia we verified the existence of a functioning metadata repository (https://metadata.geoportaal.ee/geonetwork/srv/est/catalog.search#/home). Searching for soil dataset in this repository we found 2 datasets published under soil theme : the 'Map of Estonian soil, 1 :10.000 scale) owned by the 'Land Board[23]' of Estonia, released under the Land Board's open data license: https://geoportaal.maaamet.ee/avaandmete-licion Open data license:

[23] 'The Land Board was established on January 16, 1990 on the basis of the Land Management Government of the Ministry of Agriculture of the Estonian Sovietic Socialist Republic. The Land Board was established with the aim of ensuring the organization and more rational use of land use; to organize geodetic and cartographic works; introduce a unified land cadastre; to organize land valuation and control the introduction of land tax; to issue work permits for land management and land surveying; resolve land disputes, etc. After a while, the Land Board was also tasked with carrying out land reform, which became one of the most challenging tasks.' https://maaamet.ee/en/administration-news-and-contact/land-board/history

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

https://geoportaal.maaamet.ee/opendata-licence; and the 'List of environmentally hazardous objects in the Estonian Environmental Register', which is described as a database containing information on the following environmentally hazardous objects: residual pollution areas and objects, ships, tanks, noise-related objects, filling stations, owned by the Estonian Environment Agency. We report here what is written in the Estonian geoportal (https://geoportaal.maaamet.ee/est/INSPIRE/Eesti-geoportaal-p737.html). In Estonia, the Ministry of the Environment is responsible for the implementation of the INSPIRE Directive. According to the Spatial Data Act (28.02.2011), the Land Board has been designated the INSPIRE contact point in Estonia. The implementation of the INSPIRE directive is coordinated by the Land Board, which manages the state spatial data geoportals - the Estonian geoportal and the Land Board's geoportal. One of the roles of the Land Board is to advise and assist data owners. In co-operation with the Information Technology Center of the Ministry of the Environment (KeMIT), the Land Board has achieved the ability to transfer spatial data to the INSPIRE data model and to create spatial data services that meet INSPIRE requirements. The Estonian spatial data metadata catalogue is also managed together. Also in the INSPIRE geoportal there are 2 dataset uploaded for soil theme for Estonia, which are the same 2 datasets published in the national geoportal.

The second slot of questions (**Q21**, **Q22**, and **Q23**) were devoted to understand whether metadata include specific information related to the access to spatial data set or to the authorities responsible for such data. The questions were the following:

> **Q21**. Does the "soil" metadata include information on the conditions that apply to access to, and use of, spatial data sets and services and, where applicable, corresponding fees ?

> **Q22.** Do the "soils" metadata include information on the public authorities responsible for the establishment, management, maintenance and distribution of these spatial data sets and services ?

> **Q23**. Do the "soils" metadata include information on possible limitations on public access ?

The answers confirmed that those metadata were given by the majority of EJP SOIL countries, since 16 countries gave 3 positive answers to the questions Q21 to Q23 : Austria, Belgium, Czech Republic, Spain, Finland, Ireland, Italy, Latvia, Netherlands, Norway, Poland, Portugal, Sweden, Slovenia, Slovakia, and UK. We verified that also for Denmark and Estonia the answers are 3 positive ones. The remaining countries gave articulated answers.

Germany, which publishes metadata on national datasets, and on federal-state datasets, declared that most metadata published include the information foreseen in the Q21 to 23, but some not. This is because some federal-states publish metadata which do not correspond to the guidelines.

Switzerland declared that the information listed in the Q22 and Q23 are given in the metadata, instead "no information is given on the conditions that apply to access to, and use of, spatial data sets and services and, where applicable, corresponding fees". Switzerland has answered to the Q21 that "there is no restriction of access and usage. The data is given as-is, without claim for completeness or guaranteed services. There are no fees."

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

France has declared that the information foreseen in the Q21 to 23 are given all by INRAE, instead sometimes BRGM do not give metadata on the conditions that apply to access to, and use of, spatial data sets and services and, where applicable, corresponding fees (Q21), and metadata on the public authorities responsible for the establishment, management, maintenance and distribution of these spatial data sets and services (Q22).

Hungary answered positively only to the Q22, therefore declared that metadata do not include information on the conditions that apply to access to, and use of, spatial data sets and services and, where applicable, corresponding fees, nor information on possible limitations on public access, but they include information on the public authorities responsible for the establishment, management, maintenance and distribution of these spatial data sets and services.

Turkey, which in the Q19 and Q20 declared that they do not publish metadata, answered to the Q21 and Q22 that “metadata is provided with Institutional permission”, and that "metadata is given on possible limitations on public access".

3.3.1 Results of the analysis of the section C

RESULTS IN A NUTSHELL

As to the specific section C) on metadata on soil information, obstacles and barriers outlined by the questionnaire results are the following:

- Lack of metadata publishing services of soil spatial data sets for Turkey;
- Lack of common information included in the metadata of soil spatial datasets published.

These barriers can be overcome by actions undertaken by the EJP SOIL countries at national level, which will be facilitated by the EJP SOIL program, aimed at :

- stimulating Turkey to establish a metadata service for environmental data.
- establishing common policy and rules, both at national and regional/federal level, to manage and publish metadata of soil information, so to include the same information.
- generating awareness by communicating information among European countries on the rules for establishing of metadata services.

This section of the questionnaire constitutes only a first analysis on the state of implementation of metadata services in EJP SOIL countries. The analysis will be further developed, analysing the quality of the implementation, based on the guidelines for metadata provided by INSPIRE.
In particular, the EJP SOIL will facilitate this process through the organisation of national policy forums and national meetings with soil data holders, owners, and expert groups and all the key stakeholders dealing with soil data management and soil reporting at national level. These activities will be performed in collaboration between WP6, WP8, and WP9, also coordinating with the European Environment Agency, the Joint Research Center, and the European Soil Partnership.

This project has received funding from the European Union’s Horizon 2020 research and innovation programme under grant agreement N° 862695

3.4 INTEROPERABILITY OF SPATIAL DATA SETS AND SERVICES (Section D)

This Section focuses specifically on the implementing rules on interoperability of spatial data sets and services, so as defined in the INSPIRE Directive 2007/2/UE. The rules are called to specify common data models, additional metadata on the interoperability to be used when exchanging spatial data sets. Interoperability in the Inspire Directive means "the possibility to combine spatial data sets and services from different sources across Europe in a consistent way".

The recital 5 of the Directive underlines that “the Infrastructure for Spatial Information in the European Community (INSPIRE) should be based on should be based on the infrastructures for spatial information that are created by the Member States and that are made compatible with common implementing rules and are supplemented with measures at Community level. These measures should ensure that the infrastructures for spatial information created by the Member States are compatible and usable in a Community and transboundary context”, in other terms, should be based on interoperability principles between Member States.

Moreover, recital 16 of the Inspire Directive highlights that “… implementing measures should be provided for, in order to facilitate the use of spatial data from different sources across the Member States. Those measures should be designed to make the spatial data sets interoperable, and Member States should ensure that any data or information needed for the purposes of achieving interoperability are available on conditions that do not restrict their use for that purpose”.

The EU Commission is also in charge to intervene to adopt implementing rules laying down technical arrangements for the interoperability and harmonisation of spatial data sets and services, rules governing the conditions concerning access to such sets and services, as well as rules concerning the technical specifications and obligations of network services (recital 33).

More specifically art. 7 of the Directive summarizes the importance of adopting implementing rules on interoperability of spatial data sets : these shall be made available in conformity with the implementing rules either through the adaptation of existing spatial data sets or through the transformation services enabling spatial data sets to be transformed with a view to achieving interoperability.

Soil is listed as theme under the Annex III. The themes of Annex III are not obliged to follow the implementation rules defined in the Article 8 of the directive, which is the main difference between the themes listed in the Annex III in comparison to the themes listed in the Annex I and II.

The first slot of questions (**Q24 - Q26)** of this section, aimed at verifying in general the adoption by European countries of the implementation of rules, regulations and standards for the interoperability of spatial data sets.

Q24. Has your State (EU or non EU) implemented specific legal provisions for the implementing rules laying down technical arrangements for the interoperability and harmonisation of spatial data sets and

This project has received funding from the European Union’s Horizon 2020 research and innovation programme under grant agreement N° 862695

services (reference to the art 7 of the Directive 2007/2/EC) ? If yes to question 24, please list the specific references.

Q25. Has your State (EU or no EU) implemented additional or other regulations for interoperability and harmonization (this can be for instance to adhere to FAIR) ? If yes to question 25, please list the specific references.

Q26. Has your State adopted relevant standards to ensure interoperability or harmonisation of spatial data sets (reference to the art 7 of the Directive 2007/2/EC) ? If yes to question 26, please list the specific references.

Results of the first question **Q24** demonstrate that a good number of the countries were aligned with a positive answer (15), apart from Austria, Switzerland, Spain, Ireland, Slovenia, and UK which declared that their states did not implement specific rules for the interoperability and harmonisation of spatial data sets and services. Finland did not give any answer to this question.

Switzerland as a non EU-country answered no to this question, but it underlined that the law of geoinformation requires each thematic data set to be transformed in a standardized minimal data model set. The country also wants to stress that all data transfers must use the INTERLIS format (https://www.interlis.ch/)

Ireland, although answering negatively, gave the reference to the national transposition of the INSPIRE directive, where it is clearly stated that “Public bodies shall ensure that all newly collected and extensively restructured spatial data sets and the corresponding spatial data services are available in conformity with the implementing rules referred to in paragraph 1 of Article 7 of the INSPIRE Directive”, but those implementing rules are not furtherly specified.

Excluding Hungary, Latvia, and Norway, all the other 11 countries of the 14 answering positively to the question, gave specific references, which are reported in the table 24. Slovakia, Poland, Belgium, Ireland, and Czech Republic gave the same references as given for the INSPIRE transposition. Turkey gave a generic declaration that “there are some ongoing studies on this topic”.

The table 24 shows the specific legal provisions of the EJP SOIL countries adopting implementing rules for the interoperability.

Table 24 References to the legal provisions adopting implementing rules for the interoperability

State	References to the legal provisions adopting implementing rules for the interoperability
BE - FL	Decree concerning the Geographical Data Infrastructure Flanders (citation caption: "GDI Decree"), https://codex.vlaanderen.be/PrintDocument.ashx?id=1017838.
CH	On the implementation of certain provisions of the Act on the Right to Information on the Environment,

This project has received funding from the European Union’s Horizon 2020 research and innovation programme under grant agreement N° 862695

	https://www.mzp.cz/www/platnalegislativa.nsf/8ED4BCF74F18165EC125781E003EDEA9/%24file/V%20103_2010.pdf.
DE	Recommendations for action for the provision of INSPIRE-compliant display services (INSPIRE View Services) [v1.0, 2011-12-19], Handlungsempfehlungen für die Bereitstellung von INSPIRE konformen Darstellungsdiensten (INSPIRE View Services)[v1.0, 2011-12-19],https://www.gdi-de.org/download/2020-03/Handlungsempfehlungen_AK_Geodienste_Inspire_Downloadservices1_3_0.pdf; Recommendations for action for the provision of INSPIRE-compliant display services (INSPIRE View Services) [v1.0, 2011-12-19]; Recommendations for action for the provision of INSPIRE-compliant download services (INSPIRE Download Services) [v1.3.0, 2016-03-23], Handlungsempfehlungen für die Bereitstellung von INSPIRE konformen Darstellungsdiensten (INSPIRE View Services)[v1.0, 2011-12-19]; Handlungsempfehlungen für die Bereitstellung von INSPIRE konformen Downloaddiensten (INSPIRE Download Services) [v1.3.0, 2016-03-23], https://www.gdi-de.org/download/2020-03/Handlungsempfehlungen_AK_Geodienste_Inspire_Downloadservices1_3_0.pdf.
FR	Article L127-3 of the Environment Code, Article L127-3 du code de l'environnement (créé par l'ordonnance n°2010-1232 du 21 octobre 2010 – art. 1), https://www.legifrance.gouv.fr/codes/article_lc/LEGIARTI000022964000/; Order of December 31, 2020 approving the national biodiversity data scheme adopted in application of article R131-34 of the Environmental Code, Arrêté du 31 décembre 2020 approuvant le schéma national des données sur la biodiversité pris en application de l'article R131-34 du Code de l'environnement, https://www.legifrance.gouv.fr/jorf/id/JORFTEXT000043038593.
IE	S.I. No. 382/2010-European Communities (Establishing an Infrastructure for Spatial Information in the European Community (INSPIRE)) Regulations, 2010, http://www.irishstatutebook.ie/eli/2010/si/382/made/en/print#.
IT	The article 11 of the law 132 of 2016 has defined the establishment of a National Environmental Informative System, to be organised and coordinated by ISPRA with the aim of cataloguing, collecting, accessing, make interoperable and sharing of geographic, territorial and environmental information generated from the activities supported, even partially, with public resources (https://www.normattiva.it/uri-res/N2Ls?urn:nir:stato:legge:2016-06-28;132). Italy has adopted OGC standards for the interoperability of spatial datasets, but the respondent to the questionnaire didn't give any legislative reference for this adoption.
LT	Law on the Management of State Information Resources of the Republic of Lithuania, Valstybės žinios, 31 December 2011, no. 163-7739, Lietuvos Respublikos valstybės informacinių išteklių valdymo įstatymas, Valstybės žinios, 2011-12-31, Nr. 163-7739, https://e-seimas.lrs.lt/portal/legalAct/lt/TAD/TAIS.415499/asr; Minister of Agriculture of the Republic of Lithuania 2017 October 24 order no. 3D-670 "On Approval of the Description of the Procedure for the Development of Spatial Data Sets of the Lithuanian Spatial Information Infrastructure, Lietuvos Respublikos žemės ūkio ministro 2017 m. spalio 24 d. įsakymas Nr. 3D-670 „Dėl Lietuvos erdvinės informacijos infrastruktūros erdvinių duomenų rinkinių kūrimo tvarkos aprašo patvirtinimo", https://e-seimas.lrs.lt/portal/legalAct/lt/TAD/1a084802b8f811e7967a9645b537eb05?jfwid=j4ag1lea;

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

	Law on Geodesy and Cartography of the Republic of Lithuania, Valstybės žinios, 2001-07-18, No. 62-2226, Lietuvos Respublikos geodezijos ir kartografijos įstatymas, Valstybės žinios, 2001-07-18, Nr. 62-2226, https://e-seimas.lrs.lt/portal/legalAct/lt/TAD/TAIS.143068/asr; Minister of Agriculture of the Republic of Lithuania 2018 June 1 order no. 3D-350 "On Approval of the Regulations of the Lithuanian Spatial Information Portal and the Data Security Regulations of the Lithuanian Spatial Information Portal", TAR, 4 June 2018, No. 9120, Lietuvos Respublikos žemės ūkio ministro 2018 m. birželio 1 d. įsakymas Nr. 3D-350 „Dėl Lietuvos erdvinės informacijos portalo nuostatų ir Lietuvos erdvinės informacijos portalo duomenų saugos nuostatų patvirtinimo", TAR, 2018-06-04, Nr. 9120, https://e-seimas.lrs.lt/portal/legalAct/lt/TAD/1162ebc1682e11e8b7d2b2d2ca774092?jfwid=rivwzvpvg.
NL	All scope documents, data catalogues, technical documents can be found on www.basisregistratieondergrond.nl/inhoud-bro/registratieobjecten/
PL	Dz.U. 2010 nr 76 poz. 489, Act of March 4, 2010 on spatial information infrastructure, http://isap.sejm.gov.pl/isap.nsf/DocDetails.xsp?id=wdu20100760489
PT	https://snig.dgterritorio.gov.pt/saber-mais/legislacao.
SE	Law (2010: 1767) on geographical environmental information, 2010-12-03, Lag (2010:1767) om geografisk miljöinformation, 2010-12-03, https://www.riksdagen.se/sv/dokument-lagar/dokument/svensk-forfattningssamling/lag-20101767-om-geografisk-miljoinformation_sfs-2010-1767; Ordinance (2010: 1770) on geographical environmental information, 2010-12-03, Förordning (2010:1770) om geografisk miljöinformation, 2010-12-03, https://www.riksdagen.se/sv/dokument-lagar/dokument/svensk-forfattningssamling/forordning-20101770-om-geografisk_sfs-2010-1770; Strategy for environmental data management, Strategi för miljödatahantering, https://www.naturvardsverket.se/strategi-for-miljodatahantering#; National geodata strategy, Developed by the National Land Survey and the Geodata Council, https://www.lantmateriet.se/sv/webb/nationell-geodatastrategi/; SIS-TS 80:2018 Geographic information – National metadata profile for geographic information, by the Swedish Institute for Standards, https://www.sis.se/en/produkter/information-technology-office-machines/applications-of-information-technology/it-applications-in-science/sis-ts-802018/.
SK	Only on a generic level, via Act no. 3/2010 Coll. on the National Infrastructure for Spatial Information, as amended, https://www.slov-lex.sk/pravne-predpisy/SK/ZZ/2010/3/20160501.
TR	There are some ongoing studies on this topic

The second question (**Q25**) investigated whether countries have also implemented additional or other regulations for interoperability and harmonization of spatial data sets (this can be for instance to adhere to FAIR).

Only Latvia did not give any answer to this question, mainly due to a limited knowledge on this topic. Among countries which gave a negative answer, Switzerland expressly declared that first technical steps involving a RDF Triple Store are being made in the project LINDAS and Visualize (https://www.visualize.admin.ch/de), and that in Switzerland there is a Open Governmental Data

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

strategy on the federal level, which might encompass partly or in full the FAIR principles on a strategic level. Switzerland specified that further information could be found at: https://www.bfs.admin.ch/bfs/en/home/services/ogd.html.

Results (table 25) demonstrated that only 7 respondents (Belgium, Germany, France, Ireland, Norway, Slovakia, and Turkey) declared to have adopted such additional or other regulations. The specific references given are reported in the table 25. Among these 7, Norway did not give any reference, Turkey just generically declared that "there are ongoing studies on this topic", Germany declared that the adoption of Open data regulation is ongoing, Belgium, and Ireland gave the same reference as for the INSPIRE transposition.

Table 25 References to additional or other regulations for interoperability and harmonization

State	References to additional or other regulations for interoperability and harmonization
BE-FL	https://codex.vlaanderen.be/PrintDocument.ashx?id=1017838
DE	The Open-Data regulation is currently published as a draft version. The national research data infrastructure call is ongoing. Both will work towards more FAIRness in data sharing. https://www.bmi.bund.de/SharedDocs/pressemitteilungen/DE/2017/01/open-data-gesetz.html; https://www.dfg.de/en/research_funding/programmes/nfdi/index.html.
FR	LAW n ° 2016-1321 of October 7, 2016 for a Digital Republic, LOI n° 2016-1321 du 7 octobre 2016 pour une République numérique, https://www.legifrance.gouv.fr/jorf/id/JORFTEXT000033202746/
IE	S.I. No. 382/2010-European Communities (Establishing an Infrastructure for Spatial Information in the European Community (INSPIRE)) Regulations, 2010, http://www.irishstatutebook.ie/eli/2010/si/382/made/en/print#.
SK	DECREE 78/2020, Office of the Deputy Prime Minister of the Slovak Republic for Investment and Informatization of 16 March 2020 on standards for public administration information technology, https://www.slov-lex.sk/pravne-predpisy/SK/ZZ/2020/78/20200501.
TR	There are ongoing studies on this topic.

The last question (**Q26**) of this slot aimed at collecting information on adopted relevant standards to ensure interoperability or harmonisation of spatial data sets.

Replies have confirmed that the majority of the participants to the survey have adopted such standards : Austria, Belgium, Czech Republic, Germany France, Ireland, Italy, Lithuania, Latvia, Netherlands, Norway, Poland, Portugal, Sweden, Slovakia, and Turkey. 4 countries did not adopt : Switzerland, Spain, Slovenia, and UK. Hungary and Finland did not answer to the question.

The participants to the survey have been requested, in case of positive answer, to give pertinent references: in some cases, no references have been indicated. The table 26 shows the results of 11 countries which have indicated the specific references requested. Czech Republic, Ireland, Poland, and Sweden gave the same references as for the transposition of the INSPIRE directive. Latvia declared that

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

due to our limited knowledge of this topic they could not comment on specifics. Austria, Germany, and Norway did not give any specification.

Table 26 References to adopted relevant standards to ensure interoperability or harmonisation of spatial data sets

State	References to adopted relevant standards to ensure interoperability or harmonisation of spatial data sets
BE - FL	Geo-legislation, guidelines, standards and recommendations., http://www.geopunt.be/voor-experts; GDI Flanders Best Practices for Metadata v2.0, Version 2.0 of the GDI Flanders Best Practices document for Metadata is the guideline for the exchange of metadata, which will come into effect from November 16, 2020, http://www.geopunt.be/voor-experts/metadata/metadata-best-practices-en-richtlijnen.
CZ	https://www.mzp.cz/www/platnalegislativa.nsf/8ED4BCF74F18165EC125781E003EDEA9/%24file/V%20103_2010.pdf.
FR	OGC SensorThings API; WMS; WFS; W3C standards. But this domain is recent and in development (for example with ontologies)
IE	Information in the European Community (INSPIRE)) Regulations, 2010 http://www.irishstatutebook.ie/eli/2010/si/382/made/en/print#
IT	Italy adopted OGC standards. "Metadata : The metadata's conformity with the INSPIRE standard is the responsibility of the data holder. The data holder must supply metadata conforming with the national standard. However, not all the metadata available at the different access points are conformant, because certain metadata were published before the publication of the INSPIRE Directive and the national decrees. Work to harmonise the metadata with the INSPIRE standard is still in progress. Network : View, discovery and downloading services are as a rule made accessible via the OGC standard. Some Regions are not yet equipped with public standard interfaces for sharing environmental information. To fill these gaps, ISPRA, in agreement with the Ministry of Environment and with the cooperation of CNR, supports the Regions identifying and proposing viable solutions for the public use of search services. Nation-wide coverage should be achieved by the time of the next report (from the Italian official report on INSPIRE implementation, 2012). https://inspire.ec.europa.eu/reports/country_reports_mr2012/IT-INSPIRE-Report-EN-TRA-0_DOC.pdf)"
LT	ISO 19119:2016, Geographic information — Services, https://www.iso.org/standard/59221.html; ISO/TS 19139:2007, Geographic information — Metadata — XML schema implementation, https://www.iso.org/standard/32557.html.
NL	NEN3610:2011, a family of spatial data standards, https://www.geonovum.nl/geo-standaarden/nen-3610-basismodel-voor-informatiemodellen/basismodel-geo-informatie-nen36102011.
PL	Dz.U. 2010 nr 76 poz. 489, Act of March 4, 2010 on spatial information infrastructure, http://isap.sejm.gov.pl/isap.nsf/DocDetails.xsp?id=wdu20100760489.
PT	OGC Web Services (WMS, WFS, ATOM), GML

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

SE	SIS-TS 80:2018 Geographic information – National metadata profile for geographic information, by the Swedish Institute for Standards, https://www.sis.se/en/produkter/information-technology-office-machines/applications-of-information-technology/it-applications-in-science/sis-ts-802018/.
SK	Indirectly ISO TC 211 and OGC standards via Act no. 3/2010 Coll. on the National Infrastructure for Spatial Information, as amended, https://www.slov-lex.sk/pravne-predpisy/SK/ZZ/2010/3/20160501; National Metadata profile, currently under the revision, http://inspire.gov.sk/clanky/konzultacia-k-sk-metadajovmu-profilu-2-0); DECREE 78/2020, Office of the Deputy Prime Minister of the Slovak Republic for Investment and Informatization of 16 March 2020 on standards for public administration information technology, https://www.slov-lex.sk/pravne-predpisy/SK/ZZ/2020/78/20210623.

The next question (**Q27**) was devoted to collecting information on standards adopted to ensure interoperability or harmonisation of spatial data sets specifically to the soil theme.

Q27. Has your State adopted relevant standards to ensure interoperability or harmonisation of spatial data sets specifically to the soil theme (reference to the art 7 Directive 2007/2/EC). If yes to question 27, please list the specific references.

Results of question **Q27** highlighted that 11 of the respondents declared that no standards to ensure interoperability or harmonisation of spatial data sets specifically to the soil theme had been adopted, two of the participants in the survey did not give any answer to this question (Hungary and Finland), whereas only 8 countries answered positively : Switzerland, France, Ireland, Italy, Netherlands, Norway, Sweden, and Turkey. Among these 8, France, Ireland, and Sweden gave the reference to the same standard as given in Q26, that is, the ones adopted generically. Turkey always gave the same generic answer: “There are ongoing studies on this topic.” The references given are reported in the table 27. Therefore, only Switzerland, Italy, Netherlands, and Norway gave the reference to specific standards adopted for soil. Also for this question we may argue that it was misunderstood by several respondent, because only Italy cited in the answer the ongoing adoption of the officially published INSPIRE standard for soil (D2.8.III.3 Data Specification on Soil – Technical Guidelines, https://inspire.ec.europa.eu/id/document/tg/so).

Table 27 Reference to adopted relevant standards to ensure interoperability or harmonisation of spatial data sets specifically to the soil theme

State	Reference to adopted relevant standards to ensure interoperability or harmonisation of spatial data sets specifically to the soil theme
CH	There is a defined minimal data set for soil information. The documentation can be found here: https://www.bafu.admin.ch/bafu/de/home/themen/boden/zustand/boden--geodatenmodelle.html.
FR	The OGC SensorThings API ; WMS ; WFS. Work in progress with the European standards

This project has received funding from the European Union’s Horizon 2020 research and innovation programme under grant agreement N° 862695

IE	Community (INSPIRE)) Regulations, 2010 http://www.irishstatutebook.ie/eli/2010/si/382/made/en/print#
IT	The Italian national official standards for soil description and soil storing in database, published by the Ministry of Agriculture and edited by CREA, https://www.researchgate.net/profile/E-Costantini/publication/260065688_Guida_ALLA_Descrizione_DEI_Suoli_IN_Campagna/links/5418551e0cf203f155ada887/Guida-ALLA-Descrizione-DEI-Suoli-IN-Campagna.pdf, which makes reference to international standards such as the U.S.D.A., N.R.C.S. 2007. National Soil Survey Handbook, title 430-VI., http://soils.usda.gov/technical/handbook/; the GEOREFERENCED SOIL DATABASE FOR EUROPE, Manual of procedures, https://esdac.jrc.ec.europa.eu/ESDB_Archive/ESBN/Backup_old/docs/1998-rep5/250k-manual-v1.pdf, which has also been translated in Italian; the adoption of INSPIRE standard for soil is ongoing, https://inspire.ec.europa.eu/id/document/tg/so.
NL	Next to INSPIRE, also the standards specified by www.basisregistratieondergrond.nl/inhoud-bro/registratieobjecten/.
NO	https://objektkatalog.geonorge.no/Pakke/Index/EAPK_05235D3C_015F_4938_B8C1_695FEBFC42DC.
SE	SIS-TS 80:2018 Geographic information – National metadata profile for geographic information

The following slot of questions (**Q28** to **Q36**) aimed at exploring which specifications cover the implementing rules for the interoperability and harmonisation of soil spatial data sets and services adopted by the EJP SOIL countries, according to art. 7 and 8, of the Inspire Directive.

Q28. Do the implementing rules for the interoperability and harmonisation of soil spatial data sets and services adopted by your State cover the definition and classification of the soil spatial objects (reference to the art 7. Directive 2007/2/EC) ?

Q29. Do the implementing rules for the interoperability and harmonisation of spatial data sets and services adopted by your State cover the way in which those spatial data are geo-referenced (reference to the art 7. Directive 2007/2/EC) ?

Q30. Do the implementing rules for the interoperability and harmonisation of spatial data sets and services adopted by your State include a common framework for the unique identification of soil spatial objects, to which identifiers under national systems can be mapped in order to ensure interoperability between them (reference to the art 8. Directive 2007/2/EC) ?

Q31. Do the implementing rules for the interoperability and harmonisation of spatial data sets and services adopted by your State include the relationship between data objects (reference to the art 8. Directive 2007/2/EC) ?

Q32. Do the implementing rules for the interoperability and harmonisation of spatial data sets and services adopted by your State include the key attributes and the corresponding multilingual thesauri

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

commonly required for policies which may have an impact on the environment (reference to the art 8. Directive 2007/2/EC) ?

Q33. Do the implementing rules for the interoperability and harmonisation of spatial data sets and services adopted by your State include information on the temporal dimension of the data (reference to the art 8. Directive 2007/2/EC) ?

Q34. Do the implementing rules for the interoperability and harmonisation of spatial data sets and services adopted by your State include updates of the data (reference to the art 8. Directive 2007/2/EC) ?

Q35. Are the implementing rules adopted by your State designed to ensure consistency between items of information which refer to the same location or between items of information which refer to the same object represented at different scales (reference to the art 8. Directive 2007/2/EC) ? If no to the question 35, please specify.

Q36. Are the implementing rules designed to ensure that information derived from different spatial data sets is comparable as regards the definition and classification of the spatial objects and the way in which those spatial data are geo-referenced (reference to the art 8. Directive 2007/2/EC) ? If no to the question 35, please specify.

Only 5 countries answered positively to the whole lot of 9 questions : Austria, Czech Republic, Lithuania, Netherlands, and Norway. Spain and Slovenia answered negatively to the whole 9 questions with no further explanation.

Hungary, Latvia, Finland, and Turkey did not answered to the 9 questions due to declared lack of knowledge. Switzerland, also, gave articulated answers concerning the "missing knowledge by the respondent on the directive, which would be needed to give proper answers". In particular Switzerland gave the following common answer to the Q28 and Q29 : “I don't know the said directive. I guess some sort of coverage is given as Switzerland has adopted a similar legal text.” The following answer was given to the Q30, Q31, and Q36 : “Not according to my knowledge - which is limited in this context.” The following answer was given to the Q32, which is about key attributes and the corresponding multilingual thesauri commonly required for policies, which may have an impact on the environment: “Maybe partly fulfilled, via the TERMDAT database.” The following specific questions were given to the Q33, Q34, and Q35 respectively: “in general, the date of creation of the data object is included in the data set. Other temporal dimension of the data is missing (e.g. validity span, embargo span, ...)”, “data may be updated, but there is no required versioning of the data.”, and “No. If e.g. there is a data mismatch, conflict or inconsistency between the data on federal and on cantonal level, priority ought to be given to the most original or most recent data. I am not aware of an existing or prior data conflict as outlined in question 35 and no resolution process had to be defined and executed previously, but conflicts such as these might exist or develop.”

This project has received funding from the European Union’s Horizon 2020 research and innovation programme under grant agreement N° 862695

Belgium answered positively to the 9 questions but specified “partly” to the Q28, and “partly because implementing rules for soil erosion data are lacking in INSPIRE-SOIL” to the Q32.

Germany gave a common articulated answer to the questions Q28 to Q34, which is the following: “This is part of the general INSPIRE directive and therefore part of the German GeoZG and derived federal regulations and their corresponding technical guideline documents. The directives requirements are not yet fully implemented for every dataset.” Germany answered positively to the Q35 and Q26 questions. Finally, the implementing rules for the interoperability and harmonisation of soil spatial data sets and services foreseen by the INSPIRE directive are therefore going to be fully implemented by Germany.

France answered positively to the whole 9 questions, and gave further specifications to the Q30 (Yes, but it is specified that Digital objects will be identified by URI, defined by BRGM), and to the Q31 (Yes, but it is specified that linked data principles are implemented by BRGM).

Ireland gave a positive answer to the Q28, Q29 and Q36, and a negative answer for the questions Q30 to Q35, with the following explanation given for the Q31 : “The relationship for individual dataset is described in metadata associated with datasets but this is not uniform across datasets.”

Italy answered positively to 6 questions and negatively to the questions Q30 (about the unique identification of soil spatial objects under national systems), Q32 (about the key attributes and the corresponding multilingual thesauri commonly required for policies which may have an impact on environment), and Q34 (about updates of the data).

Sweden answered positively to the 9 questions adding the following specifications to the Q34 and Q35: “The data available is a standardized Atlas of the soil representation in Sweden. In the future we plan to release more detailed data.”

Slovakia gave a quite different answers to the Q28, in comparison to what has been answered by the other EJP SOIL partners: “For time being there has been no identified national or domain specific extensions of the definition and classification of soil spatial object defined via INSPIRE legal framework and UML model. If there will be such a need with clearly identified underlying use cases, the Ministry of the environment of Slovak republic (responsible for INSPIRE implementation) is open to cooperate on such types of activities.” This answer suggests that Slovakia interpreted the question in the sense that specific national implementing rules were asked, excluding the ones defined via the INSPIRE legal framework and UML model. This is confirmed by the answers given to the questions Q29 and Q31 to Q36, which is the following: “There are no country specific requirements in addition to those defined by the INSPIRE legal framework and relevant technical guidance documentation.” Slovakia, finally, gave the following articulated answer to the Q30: “Unique identifier framework is partially identified via eGovernment policy and is currently under development also to take into consideration specific INSPIRE requirements.” By a whole we can say that Slovakia gave a positive and articulated answer to the 9 questions.

This project has received funding from the European Union’s Horizon 2020 research and innovation programme under grant agreement N° 862695

Portugal answered positively with no further explanation to the whole 9 questions with the exception of the Q33, which is about the temporal dimension of the data.

Poland gave a positive answer to 6 questions, declared that the work is ongoing for the Q28 and for the Q30, and declared that no information is available in relation to Q32, which is about the key attributes and the corresponding multilingual thesauri commonly required for policies which may have an impact on environment.

The UK gave a negative answer for 8 questions above 9 but with an explanation which seems to declare the contrary, that is, that common geospatial standards are instead adopted. Furthermore, the UK answered positively to the Q31 which is about the implementing rules for the relationship between data objects. For all the other questions the UK answered negatively adding the following statement: "No standards were adopted as such. The UK Location Programme through INSPIRE, promoted the use of common geospatial standards. A more detailed strategy is proposed in the UKs Geospatial Strategy 2020 to 2025[24]: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/894755/Geospatial_Strategy.pdf."

The answers given by the EJP SOIL countries to these 9 questions evidenced as the questions were probably too difficult, not properly expressed, therefore subject to different interpretations, but hat also the underlying articles of the INSPIRE directive could lead to such misunderstanding. Finally, the knowledge of this subject was not completely available and/or sure for the respondents to the questionnaire. A capacity building on this topic was evidenced as needed.

[24] We report here what is foreseen in this geospatial strategy about *data standards* : "Work to introduce common standards for geospatial data within the UK and Europe began several decades ago. For example, the 2009 UK INSPIRE regulations established a basic and flexible spatial data infrastructure using common standards for geospatial data so it can easily be found, viewed and downloaded. The main purpose of INSPIRE data is environmental reporting and the regulations cover a comprehensive list of 34 data themes. The Geospatial Commission's partner bodies play a key role, alongside organisations such as the Association for Geographic Information (AGI) and the British Standards Institution (BSI). Internationally, bodies such as the International Organisation for Standardization (ISO) and the Open Geospatial Consortium (OGC) have a key role, and data standards are an important theme in the UN's Integrated Geospatial Information Framework (IGIF). The Geospatial Commission is committed to the development and improvement of standards that enable maximum value to be derived from location data. We will consider the direction that the UK should take on standards for location data that promote both interoperability and innovation, working with Department for Digital, Culture, Media and Sport (DCMS), the Government Digital Service (GDS), Defra and ONS to ensure that appropriate governance of data standards is in place.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

3.4.1 Results of the analysis of the section D

RESULTS IN A NUTSHELL

As to the specific section D) on the interoperability of spatial data sets and services, obstacles and barriers outlined by the questionnaire results are the following:

- Lack of knowledge on the specific topic of this section on interoperability, and on the specific implementing rules foreseen by the INSPIRE regulation (therefore some questions were not answered or may be answered incorrectly);
- Lack of uniformity among the European States on the adoption of implementing rules and standard for the interoperability of spatial data sets, and specifically on soil spatial data sets;
- Lack of uniformity among the European States on the adoption of additional or other regulations for the interoperability and harmonization of spatial data sets;
- Lack of networking among European States.

These barriers can be overcome by an action by different European States at national level supported by the EC and by EJP SOIL programme in its participating countries aiming at :

- consolidating the adoption of implementation rules and standards in a common framework facilitating the understanding of it in a coordinated way (best practices, guidelines, policies);
- clarifying institutionally when and how such implementing rules for the interoperability have to be adopted;
- supporting and encouraging a general and common framework on data models, additional metadata on the interoperability to be used when exchanging spatial data sets (best practices, guidelines);
- promoting a common culture on the importance of interoperability of spatial data sets, especially in the field of soil data, through round table, workshops and permanent networks in the countries participating to the survey;
- generating awareness by facilitating and implementing communication among European States to create a common framework on interoperability of spatial data sets in general, and soil data.

In particular, the EJP SOIL will facilitate this process through capacity building, to which will be invited data holders, and expert groups and all the key stakeholders dealing with soil data management and soil reporting at national level. These activities will be performed in collaboration between WP6, and the task 5.5, and could be also coordinated with the European Environment Agency, the Joint Research Center, and the European Soil Partnership.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

3.5 NETWORK SERVICES (Section E)

This section aimed at investigating on the state of implementation of the Directive 2007/2/EC, INSPIRE, in relation to the establishment of network services for the spatial data sets in the different EJP SOIL countries.

According to recital 17 of the INSPIRE Directive "Network services are necessary for sharing spatial data between the various levels of public authority in the Community. Those network services should make it possible to discover, transform, view and download spatial data and to invoke spatial data and e-commerce services. The services of the network should work in accordance with commonly agreed specifications and minimum performance criteria in order to ensure the interoperability of the infrastructures established by the Member States. The network of services should also include the technical possibility to enable public authorities to make their spatial data sets and services available".

In art. 11 of the INSPIRE directive the network services are listed to be established by MS for the spatial data sets and services for which metadata have been created in accordance with the Directive.

Article 11 of the Directive 2007/2/EC
Network services

Article 11(1)
Member States shall establish and operate a network of the following services for the spatial data sets and services for which metadata have been created in accordance with this Directive:
(a) **discovery** services making it possible to search for spatial data sets and services on the basis of the content of the corresponding metadata and to display the content of the metadata;
(b) **view** services making it possible, as a minimum, to display, navigate, zoom in/out, pan, or overlay viewable spatial data sets and to display legend information and any relevant content of metadata;
(c) **download** services, enabling copies of spatial data sets, or parts of such sets, to be downloaded and, where practicable, accessed directly;
(d) **transformation** services, enabling spatial data sets to be transformed with a view to achieving interoperability;
(e) services allowing spatial data services to be **invoked**.
Those services shall take into account relevant user requirements and shall be **easy to use, available to the public and accessible via the Internet** or any other appropriate means of telecommunication.

Article 11(2)
For the purposes of the services referred to in point (a) of paragraph 1, as a **minimum** the following combination of **search criteria** shall be implemented:
(a) keywords;
(b) classification of spatial data and services;
(c) the quality and validity of spatial data sets;

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

(d) degree of conformity with the implementing rules provided for in Article 7(1);
(e) geographical location;
(f) conditions applying to the access to and use of spatial data sets and services;
(g) the public authorities responsible for the establishment, management, maintenance and distribution of spatial data sets and services.

Article 11(3)
The **transformation services** referred to in point (d) of paragraph 1 shall be combined with the other services referred to in that paragraph in such a way as to enable all those services to be operated in conformity with the implementing rules provided for in Article 7(1).

In relation to the first slot of questions of this section (**Q37-Q40**), the aim was to collect information on such network services: which of them are given, whether they are free of charge or covered by a specific licence.

Q37. Did your State/Region establish and operate a network of services for the spatial data sets and services for which metadata have been created (reference to the art 11 Directive 2007/2/EC) ?

Q38. If yes to the previous question, which one of the following services are given ?

Q39. If yes to question 37, are those services free of charge (reference to the art 14 Directive 2007/2/EC) ?

Q40. If yes to question 37, are those services covered by license of use (reference to the art 14 Directive 2007/2/EC) ? If yes to the question, please specify the licence(s) used. Indicate none if this is the case.

The first question (**Q37**) which aimed at investigating if such network services work and operate in the single European countries, demonstrated that almost all the respondents do have. Only Turkey specified that the network of services is under establishment, and the current official link (https://inspire.gov.hu/) to the Hungarian geoportal does not run.

In relation to the Q37 we made some researches to integrate the information for Denmark and Estonia, which did not answered to the questionnaire (see also the integrations in the Q19 and Q20).

For Denmark we verified that the Ministry of the Environment and the Danish Nature Agency own a geoportal named 'State groundwater mapping' (https://miljoegis.mim.dk/cbkort?&profile=grundvand) where they publish maps of soil filtering function in relation to groundwater. In the INSPIRE geoportal only a national scale soil related dataset is available, with no clear indication of the data owner, which is not viewable, nor downloadable. Finally a Danish Environmental Portal exists (https://www.miljoeportal.dk/).

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

In Estonia, the implementation of the INSPIRE directive is coordinated by the Land Board, which manages the state spatial data geoportals - the Estonian geoportal (https://geoportaal.maaamet.ee/est/INSPIRE/Eesti-geoportaal-p737.html) and the Land Board's geoportal. One of the roles of the Land Board is to advise and assist data owners. In co-operation with the Information Technology Center of the Ministry of the Environment (KeMIT), the Land Board has achieved the ability to transfer spatial data to the INSPIRE data model and to create spatial data services that meet INSPIRE requirements. In the INSPIRE geoportal there are 2 datasets uploaded for soil theme for Estonia, which are the same 2 datasets published in the national geoportal.

Countries which opted for a positive answer were also requested to give the link to the network service, which are reported in the table 28.

Table 28 Links to the network of services of spatial information available in the EJP SOIL countries

State	Links to the *network of services of spatial information available in the EJP SOIL countries*
AT	www.geoland.at
BE-FL	https://metadata.vlaanderen.be/srv/dut/catalog.search#/home
CH	https://map.geo.admin.ch/
CZ	https://geoportal.gov.cz/
DE	https://geoportal.de/portal/main/
DK	https://www.miljoeportal.dk/
ES	https://www.idee.es/visualizador/
EE	https://geoportaal.maaamet.ee/est/INSPIRE/Eesti-geoportaal-p737.html
FI	https://www.syke.fi/en-US/Open_information/Open_web_services/INSPIRE_WMS_and_WFS
FR	www.geocatalogue.fr
HU	The current official link to the geoportal does not run: https://inspire.gov.hu/
IE	https://inspire.geohive.ie/geoportal/#mapPanel
IT	SINA, http://geoportale.isprambiente.it/sfoglia-il-catalogo/, geoportal http://portalesgi.isprambiente.it/it; Lombardy, http://www.geoportale.regione.lombardia.it/; Tuscany, geoportal, https://www.regione.toscana.it/-/geoscopio, Tuscany WMS services, https://www.regione.toscana.it/servizi-wms, Tuscany metadata, http://dati.toscana.it.
LT	https://www.geoportal.lt/geoportal/web/en; https://zis.lt/en/duomenys/
LV	https://geometadati.viss.gov.lv/geoportal/catalog/wrapper/ivisgds.page
NL	Discovery: www.nationaalgeoregister.nl; view and download: www.pdok.nl, www.broloket.nl.
NO	https://www.geonorge.no/en/
PL	http://www.geoportal.gov.pl
PT	https://snig.dgterritorio.gov.pt/rndg/srv/por/catalog.search#/map
SE	https://www.geodata.se/geodataportalen.
SI	http://www.geoportal.gov.si/
SK	https://rpi.gov.sk/client/map/#inspire; http://geoportal.gov.sk

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

UK	https://naturalengland-defra.opendata.arcgis.com/; http://mapapps2.bgs.ac.uk/ukso/home.html; https://www.spatialni.gov.uk/; https://map.environment.gov.scot/sewebmap/; https://lle.gov.wales/home.

The 15 countries which opted for a positive answer were also requested to specify which network services are in place, according to a given multiple choice (**Q38**). The table 29 shows the results:

Table 29 Types of network of services of spatial information available in the EJP SOIL countries

State	Type of network services for the spatial data sets				
	Discovery	View	Download	Transformation	Invoking
AT	yes	yes	yes	no	no
BE-FL	yes	yes	yes	yes	no
CH	yes	yes	yes	no	no
CZ	yes	yes	yes	no	yes
DE	yes	yes	yes	yes	yes
ES	yes	yes	yes	no	yes
FI	yes	yes	yes	no	yes
FR	yes	yes	yes	no	yes
IE	yes	yes	no	no	no
IT	yes	yes	yes	no	yes
LT	yes	yes	yes	no	yes
LV	no	no	yes	no	no
NL	yes	yes	yes	no	no
NO	yes	yes	yes	no	yes
PL	yes	yes	yes	no	yes
PT	no	yes	no	no	yes
SE	yes	yes	yes	no	no
SI	yes	yes	yes	no	yes
SK	no	yes	yes	no	no
UK	yes	yes	yes	no	no

Q39 was devoted to collecting information on the availability of such network services : in particular, if those services are given free of charge or not. Among the 15 countries having those services, 12 answered positively, that the services are given free of charge. The Austria, Czech Republic, and UK declared instead that the access to some spatial datasets is free, but to others requires payment.

As regards to the last question of this slot (**Q40**), it focused on investigating if those services are covered by license of use or not. Among the 15 countries having those services, 11 answered that the services are given under license, and specified the licenses used, as reported in the table 30. Only Switzerland does not indicate a specific license used since “the license situation seems to be a very

This project has received funding from the European Union’s Horizon 2020 research and innovation programme under grant agreement N° 862695

complex situation and in dynamic change." Lithuania, Latvia, and Sweden instead declared that the services are given without license. Poland declared that it depends on the dataset.

Table 30 Types of licences of use for network services for the spatial data sets

State	Types of licences of use for network services for the spatial data sets
AT	The licenses are specified in the metadata of each dataset.
BE-FL	Model License Free Reuse, https://overheid.vlaanderen.be/modellicentie-gratis-hergebruik.
CH	The license situation seems to be a very complex situation and in dynamic change.
CZ	Specific licenses exist for different providers of the data sets.
DE	The licenses are defined by the federal states owning the datasets, using several state-based licenses: e.g. General Terms and Conditions (GTC) of the Federal Institute for Geosciences and Natural Resources (BGR), https://www.bgr.bund.de/DE/Gemeinsames/Produkte/Downloads/AGB.pdf?__blob=publicationFile&v=4; Ordinance laying down the conditions of use for the provision of federal geodata, GeoNutzV,http://www.gesetze-im-internet.de/geonutzv/; Data licence Germany - Zero - Version 2.0, DL-DE->BY-2.0, https://www.govdata.de/dl-de/zero-2-0; Terms of use for geographic data from the State Office for Surveying, Geoinformation and Land Development (LVGL), https://geoportal.saarland.de/abgabe_gdz/Nutzungsbedingungen/Nutzungsbedingungen_Geofachdaten_LVGL.pdf.
FR	The article 14 of the Directive refers to licences when data is not free. So the question seems ambiguous. For non-free data, there are licences that depend on the organization that sells the data. For free data, the licence is the national one: https://www.etalab.gouv.fr/licence-ouverte-open-licence.
IT	The licenses are specified in the metadata of each dataset, and depend on the data owner: e.g. the datasets published on the national network service (SINA, http://geoportale.isprambiente.it/sfoglia-il-catalogo/) do not indicate licenses in the metadata; Tuscany region apply the license Creative Commons CC-BY 4.0, Lombardy region apply free access licenses.
NL	CC0/Public Domain
NO	Norwegian Licence for Open Government Data (NLOD) 2.0 https://data.norge.no/nlod/en/2.0/
SK	No limitations to public access, https://inspire.ec.europa.eu/metadata-codelist/LimitationsOnPublicAccess/noLimitations
UK	Some services require only an open government license, other services require a data license for data covered by IP.

The next question (**Q41**) focused on the minimum combination of search criteria implemented in the network of services.

Q41. Which are the search criteria implemented in the network of services ?

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

Countries which declared to have network services for spatial data sets were requested to choose among different search criteria and more than one choice was possible :

- keywords
- classification of spatial data and services
- the quality and validity of spatial data set
- degree of conformity with the implementing rules
- geographical location
- conditions applying to the access to and use of spatial data sets and services
- the public authorities responsible for the establishment, management, maintenance and
- distribution of spatial data sets and services
- other (please specify)

The first search criterion (keywords) is the most implemented as shown in the table 31.

Table 31 Search criteria implemented in the network services for the spatial data sets

State	Search criteria								
	Keywords	Classification	Quality	Conformity	Location	Access conditions	Owners	Distribution	Other
AT	yes	yes	yes	no	yes	yes	yes	no	no
BE-FL	yes	yes	yes	yes	yes	no	yes	no	no
CH	yes	yes	no	no	yes	no	yes	no	no
CZ	no	yes	no	yes	no	no	no	no	no
DE	yes	yes	yes	no	no	no	yes	no	no
FR	yes	yes	yes	no	yes	yes	yes	no	no
IT	yes	yes	yes	yes	yes	no	yes	no	no
LT	yes	yes	no	no	yes	no	yes	no	no
LV	yes	no	no	no	no	no	yes	no	no
NL	yes	yes	yes	no	yes	no	yes	no	no
NO	yes	yes	no	no	yes	yes	yes	no	no
PL	yes	no	no	no	yes	no	no	no	no
SE	yes	yes	no	no	no	no	yes	no	no
SK	yes	no	no	no	no	no	no	no	no
UK	yes	no	no	no	yes	no	no	no	no

France gave further specifications. Possibilities to search are varying among the platforms, for example: CSW OGC standards are possible for http://www.geocatalogue.fr/; service type, scale,

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

resolution, formats and date for systems based on geoserver; Geoportail.fr (soil geoportal: https://www.geoportail.gouv.fr/donnees/carte-des-sols) offers fewer possibilities (geographical location, themes, keywords).

Italy also specified that the search criteria depends on the platform. For the national platform (SINA, http://geoportale.isprambiente.it/sfoglia-il-catalogo/) the search criteria are keywords, classification, and geographical location; for Tuscany portal the search criteria are keywords, classification, and the owners; for Lombardy portal the search criteria are keywords, classification, quality, conformity, geographical location, and the owners.

The question **Q42** was dedicated to the technical possibility for public authorities to link their spatial data sets and services to the network of services.

Q42. Are the public authorities in your State/Region given the technical possibility to link their spatial data sets and services to the network of services ?

All the countries having the network services answered positively to this question.

The question **Q43** has investigated the possibility of linking the network of services upon request to third parties.

Q43. Is there the possibility, in your State/Region, to link the network of services upon request to third parties whose spatial data sets and services comply with the implementing rules for metadata and interoperability (reference to the art 11. Directive 2007/2/EC) ?

Among the countries having the network services, only Germany, Lithuania, UK, Latvia, and Switzerland answered negatively to this question.

Netherlands specified that this possibility was given to the following third parties : nature conservation organisations, contractors, water companies.

As regards **Q44**, the aim is to investigate in which way the services listed in question 37 are made available for the users.

Q44. Are the services of question 37 made available through the INSPIRE geo-portal (https://inspire-geoportal.ec.europa.eu/) or through a national/regional portal, or through both (reference to the art 15. Directive 2007/2/EC) ?

The 15 countries which declared to have network services for spatial data sets were requested to choose among different options and more than one choice was possible :

- the INSPIRE geo-portal, https://inspire-geoportal.ec.europa.eu/
- a national/regional portal
- both

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

All the EJP SOIL countries, with the exception of UK and Turkey have such services either through a national/regional geo-portal and through the INSPIRE geo-portal, but the number of datasets available inside the INSPIRE geo-portal vary considerably country by country[25].

3.5.1 Results of the analysis of the section E

RESULTS IN A NUTSHELL

As for network services the following barriers emerged:

- Lack of uniformity in implementing network services, and consequently the national/regional network of services are in many cases very difficult to used by the users;
- Difficulties in the maintenance and updating of the network of services;
- Lack of networking between the institutions responsible for the maintenance of the network of services and the public institutions owning the spatial data set, and in particular the environmental and soil dataset, so that several spatial datasets are not uploaded;
- Lack of harmonization on access and search criteria for the spatial data set;
- Lack of a network of services implemented in Turkey;
- Lack of sharing spatial dataset in the INSPIRE geo-portal by the UK.

These barriers can be overcome by an action by different European States at national level supported by the EC and, which could be facilitated by the EJP SOIL programme, aimed at :

- supporting Turkey in the implementation of network of services;
- encouraging UK to share spatial datasets also in the INSPIRE geo-portal, similarly as Norway and Switzerland, although it is no more a MS;
- promoting a level of standardization able to create a common framework for information and network services;
- promoting national networking among the institutions responsible for the maintenance of the network of services and the institutions owners of the spatial datasets.

In particular, the EJP SOIL will facilitate this process through the organisation of national policy forums and national meetings with soil data holders, owners, expert groups and all the key stakeholders dealing with soil data management and soil reporting at national level, and through capacity building, to which will be invited data holders, expert groups and all the key stakeholders dealing with soil data management at national level. These activities will be performed in collaboration between WP6, WP8, WP9, and the task 5.5, and could be also coordinated with the European Environment Agency, the Joint Research Center, and the European Soil Partnership.

[25] INSPIRE Geoportal (europa.eu)

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

3.6 DATA-SHARING (Section F)

The Section aims at offering an overview of the framework of data sharing under the Directive 2003/04/EC on public access to environmental information, and the INSPIRE directive 2007/2/EC (and linked EU Directives and national transpositional laws). According to Recital (3) of the INSPIRE Directive "The problems regarding the availability, quality, organisation, accessibility and sharing of spatial information are common to a large number of policy and information themes and are experienced across the various levels of public authority. Solving these problems requires measures that address exchange, sharing, access and use of interoperable spatial data and spatial data services across the various levels of public authority and across different sectors. An infrastructure for spatial information in the Community should therefore be established". Furthermore, recital (22) stresses that: "Public authorities need to have smooth access to relevant spatial data sets and services during the execution of their public tasks. Such access can be hindered if it depends on individual ad hoc negotiations between public authorities every time access is required. Member States should take the necessary measures to prevent such practical obstacles to the sharing of data, using for example prior agreements between public authorities".

In relation to the first slot of questions (**Q45**, **Q46 and Q47**), they aimed at investigating if and which are the conditions and limitations to access the soil point observations with coordinates owned by each institution involved in the survey.

Q45. Are there conditions and limitations to access the soil point observations with coordinates owned by your institution (we do not refer here to soil data that your institution has received from other soil data owners, under mutual agreement) ?

Q46. If you answered yes in the previous question, which one of the following conditions and limitations apply to the soil point observations with coordinates (more than one answer possible) (reference to the art 13. Directive 2007/2/EC) ?

Q47. Which are the possible incentives for sharing the soil point observations with coordinates owned by your institution ?

The results of the first question (**Q45**) showed (figure 14) that almost all of the countries (14) opted for a positive answer declaring that conditions and limitations to access the soil point observations are in force : Austria, Belgium, Switzerland, Czech Republic, Germany, Spain, Finland, France, Ireland, Norway, Sweden, Slovakia, Turkey, and UK. Austria specified that the answer given was related to the BORIS-database (https://www.umweltbundesamt.at/boris). For Italy and Latvia differentiated answers were given by different soil data owners. CREA, and ERSAF, for Italy, declared that conditions and limitations were in force, while Consorzio Lamma declared not. The State Plant Protection Service, and the Ministry of Agriculture-Real Estate of Latvia declared that conditions and limitations were in force, while the University of Latvia declared not. Hungary, Lithuania, Netherlands, Poland, Portugal,

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

and Slovenia gave a negative answer (no conditions and limitations to access). Poland specified that "data gathered within state monitoring of soil quality are published on-line."

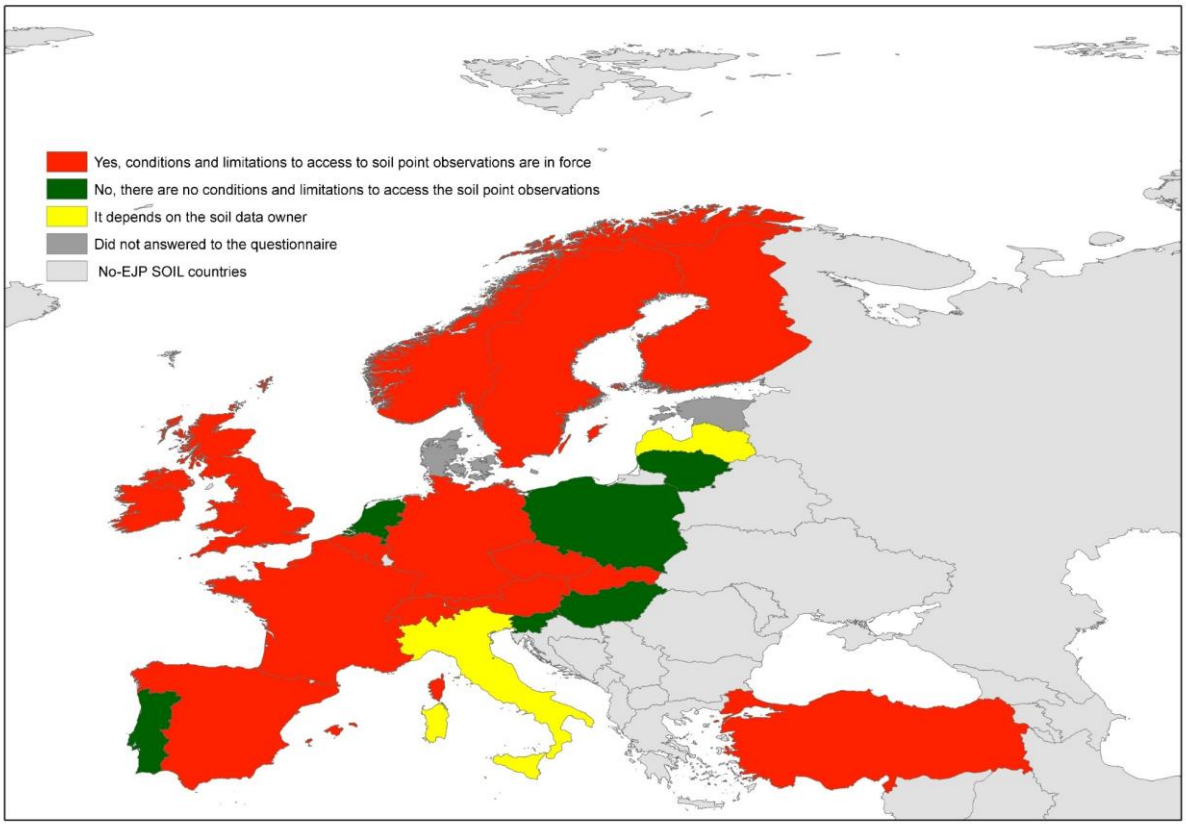

Figure 14 Presence of conditions and limitations to access to soil point observation owned by EJP SOIL institutions

The countries which answered positively have been requested to specify the conditions and limitations according to multiple choices (more than one option is possible) identified for the questionnaire, and reported in the green box below. Some of the listed conditions (6 to 13) are based on the exceptions foreseen in the Article 4 of the Directive 2003/4/EC.

Conditions and limitations to access to soil datasets identified in the questionnaire

1. the data cannot be published online
2. the data cannot be used to produce maps, or other land evaluations, without your approval and/or without your participation to the mapping elaborations
3. the data can be published online and used to produce maps, or other land evaluations, given that the data owner has been cited and keep informed

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

4. the data can be published online and used to produce maps, or other land evaluations, but some sensitive data must be hidden (please specify which ones)

5. the data can be published online, but under a specific license (e.g. Creative Commons, or others), please specify

6. the public access cannot be given because it adversely affects the confidentiality of the proceedings of public authorities

7. the public access cannot be given because it adversely affects the international relations, public security or national defence.

8. the public access cannot be given because it adversely affects the course of justice, the ability of any person to receive a fair trial or the ability of a public authority to conduct an enquiry of a criminal or disciplinary reason

9. the public access cannot be given because it adversely affects the confidentiality of commercial or industrial information, where such confidentiality is provided for by national or Community law to protect a legitimate economic interest, including the public interest in maintaining statistical confidentiality and tax secrecy

10. the public access cannot be given because it adversely affects the intellectual property rights

11. the public access cannot be given because it adversely affects the confidentiality of personal data and/or files relating to a natural person where that person has not consented to the disclosure of the information to the public, where such confidentiality is provided by national or Community law

12. the public access cannot be given because it adversely affects the interest or protection of any person who supplied the information requested on a voluntary basis without being under, or capable of being put under, a legal obligation to do so, unless that person has consented to the release of the information concerned

13. the public access cannot be given because it adversely affects the protection of the environment to which such information relates, such as the location of rare species

14. other conditions and limitations apply, or more specification are needed (please specify)

The table 32 shows the conditions and limitations to access to soil point observation with coordinates according to the single country.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

Table 32 Conditions and limitations to access to soil point observations with coordinates owned by institutions responding to the questionnaire in the EJP SOIL countries

State	Conditions and limitations to access as identified in the green frame at pages 132-133													
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
AT	x					x								
BE-FL												x		x
CH														x
CZ		x												
DE											x	x		x
ES			x		x						x	x		
FI	x	x				x					x	x		
FR	x			x			x				x	x	x	
IE											x	x		
IT1										x				
IT**2**	x	x							x			x		
LV**2**	x								x					
LV3														x
NO											x			
SE		x		x								x		x
SK					x									
TR	x		x	x						x				x
UK	x	x								x				x
Total per country	6	5	2	3	2	2	1	0	1	3	6	8	1	7

IT1 = CREA ; IT2 = ERSAF ; LV2 = The State Plant Protection Service ; LV3 = the Ministry of Agriculture-Real Estate.

Belgium, Switzerland, Germany, Finland, the Ministry of Agriculture-Real Estate of Latvia, Sweden, and UK added further conditions and limitations in free text space, which are reported in the table 33.

Table 33 Further conditions and limitations to access to soil point observations with coordinates owned by institutions responding to the questionnaire in the EJP SOIL countries

State	Further conditions and limitations specified in free text space
BE-FL	The data can be published online and used to produce maps, or other land evaluations but the exact coordinates must be hidden because the exact location of monitoring points must remain secret.
CH	The usage of cantonal data has to be granted by the corresponding cantons previously. The coordinates of some data points might have been randomized/rounded. Some data might not be publicly available, such as soil pollution data.
DE	The data is provided but its geolocation accuracy was decreased to not provide landowner information.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

FI	If a legal consultation indicated that the data - collected from practical farms with landowner's consent – could in principle be shared, the geographical coordinates could be blurred prior the opening of the data.
IT	The data can be published, but the reference to the intellectual property should be given to the authors of scientific papers, when available
LV3	There is some public data displayed, but the whole set of data can be accessed under special permission for specific territory.
SE	Coordinates must be hidden. We can approve the use of our soil point observations if the final result won't reveal the coordinates. (Or at least with an uncertainty of 50 km.)
UK	Some soil datasets are freely available, but institutions retain IP eg: UKCEH Countryside survey soils (England and Wales), https://countrysidesurvey.org.uk/content/data-access; GMEP/ERAMMP soil monitoring (Wales), https://catalogue.ceh.ac.uk/documents/0fa51dc6-1537-4ad6-9d06-e476c137ed09; BioSOIL (England and Wales), https://map.bgs.ac.uk/arcgis/services/UKSO/UKSO_Forest_Research/MapServer/WmsServer?request=getCapabilities&service=WMS; National Soil Inventory of Scotland (1978-88), https://www.hutton.ac.uk/learning/natural-resource-datasets/soilshutton/soils-maps-scotland/download; TELLUS Regional A & S Soils (Northern Ireland), https://www.bgs.ac.uk/gsni/tellus/data_licensing/index.html.

LV3 = the Ministry of Agriculture-Real Estate

The final question of this slot (**Q47**) was directed to collect information on the possible incentives for sharing the soil point observations with coordinates owned by the single national institutions.

This question was open to all the countries, either the ones which have declared they do not put conditions in the sharing of the soil point observations with coordinates owned by the single national institutions. Countries were requested to opt according to the following multiple choices (more than one option is possible):

1. an economic payment is given to soil data owners;
2. signed mutual agreements inside projects;
3. the establishment of a permanent collaboration formally recognized;
4. other.

If countries opted for the "other" option, then a specification has been delivered.
The most chosen options were the second and the third. Detailed replies are shown in the table 34.

Table 34 Possible incentives for sharing soil point observations with coordinates owned by institutions responding to the questionnaire in the EJP SOIL countries

State	Incentives for sharing soil point observations with coordinates			
	economic payment	signed mutual agreements	permanent collaboration	other

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

AT		x	x	x
BE-FL		x	x	x
CH		x	x	
CZ				x
DE		x	x	x
ES		x		
FR		x		x
HU		x	x	
IE		x		
IT		x	x	
LT		x	x	
LV		x		x
NL				x
NO	x	x		
PL		x	x	
PT				x
SE		x		
SK	x			
TR		x		x
UK	x	x	x	
TOTAL	3	14	7	9

Further specifications given by the countries on incentives to share soil point observation are reported in the table 35.

Table 35 Further specifications on incentives for sharing soil point observations with coordinates owned by institutions responding to the questionnaire in the EJP SOIL countries

State	Further specifications on incentives for sharing
AT	Austrian soil map: All information is free of charge and coordinates are not distorted. Basically, data sets (shp-files) are fee required but for free if they are used for scientific projects (then signed mutual agreements are required).
BE-FL	Open data policy
CZ	None (no incentives needed)
DE	Coordinates cannot be shared, if this is not in agreement with the landowner / tenant. Informing landowners / tenants that soil data will be published georeferenced with precise coordinates will significantly reduce acceptance for data collection.
FR	This will depend on the Regulation (EU) 2016/679 on General Data Protection (GDPR), which can be reported in mutual signed agreements
IT**1**	Signed mutual agreements inside projects

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

IT2	Signed mutual agreements inside projects, the establishment of a permanent collaboration formally recognized
IT3	We provide our data (no incentives needed)
LV**1**	We provide our data (no incentives needed)
LV2	Signed mutual agreements inside projects, Information is provided to the public administrations upon request
LV3	special request form has to be filled
NL	Other: contract with the State for the costs to update, deliver and maintain the data for the Soil Map of The Netherlands, Geomorphological Map of The Netherlands, Ground Water Table Depths of The Netherlands and related soil point observations
PT	Other: Informal agreements
TR	Other: to apply data sharing rules of the data owner Institutions

IT1 = CREA ; IT2 = ERSAF ; IT3 = Consorzio Lamma ; LV1 = University of Latvia (UL) ; LV2 = The State Plant Protection Service. LV3 = the Ministry of Agriculture-Real Estate

The majority of the countries indicated as conditions: the public access cannot be given because it adversely affects the interest or protection of any person who supplied the information requested on a voluntary basis without being under, or capable of being put under, a legal obligation to do so, unless that person has consented to the release of the information concerned; the data cannot be published online, and the public access cannot be given because it adversely affects the confidentiality of personal data and/or files relating to a natural person where that person has not consented to the disclosure of the information to the public, where such confidentiality is provided by national or Community law, that the data cannot be used to produce maps, or other land evaluations, without your approval and/or without your participation to the mapping elaborations, and that other conditions apply, and that the data can be published online and used to produce maps, or other land evaluations, given that the data owner has been cited and keep informed. It is interesting to note that the other conditions, indicated autonomously by the respondents, converged on the need to decrease the geolocation accuracy. The recognition of IP rights and the hiding of sensitive data was also a mayor condition.

Summarizing these conditions, soil point data usually are shared at the condition that the coordinates are decreased in accuracy otherwise they cannot be published online, the soil data owners are involved in the mapping elaborations, and sensitive data are hidden. The ground for these conditions are found in the protection of personal property and personal data. The recognition of IP rights is also recognised as a mayor condition. The signing of a mutual agreement is the main incentive for soil point data sharing, followed by the establishment of a permanent collaboration.

The second slot of questions (**Q48**, **Q49 and Q50)** aimed at investigating if and which are the conditions and limitations to access to the soil polygon maps owned by each institution involved in the survey, and which are the incentives for sharing the soil polygon maps.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

Q48. Are there conditions and limitations to access to the soil polygon maps owned by your institution (we do not refer here to soil data that your institution has received by other soil data owners, under mutual agreement) ?

Q49. If you answered yes in the previous question, which one of the following conditions and limitations apply to the soil polygon maps ?

Q50. Which are the possible incentives for sharing the soil polygon maps owned by your institution (more than one answer possible) ?

The results of the first question (**Q48**) showed (figure 15) that 12 countries (Austria, Czech Republic, Germany, Spain, France, Ireland, Poland, Portugal, Slovenia, Slovakia, Turkey, and UK) opted for a positive answer declaring that conditions and limitations to access to the soil polygon maps owned by institutions are in force. For Italy and Latvia differentiated answers were given by different soil data owners. CREA, for Italy, declared that conditions and limitations were in force, while ERSAF and Consorzio Lamma declared not. The State Plant Protection Service, and the Ministry of Agriculture-Real Estate of Latvia declared that conditions and limitations were in force, while the University of Latvia declared not. Belgium, Switzerland, Hungary, Lithuania, Netherlands, and Norway gave a negative answer (no conditions and limitations for sharing). Finland and Sweden specified that they do not have soil polygon maps.

The countries which answered positively have been requested to specify the conditions and limitations according to multiple choices (more than one option is possible) identified for the questionnaire **(Q49)**, which are the same list as for the question Q45.

The table 36 shows the conditions and the limitations options according to the single country which has opted for a positive answer.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

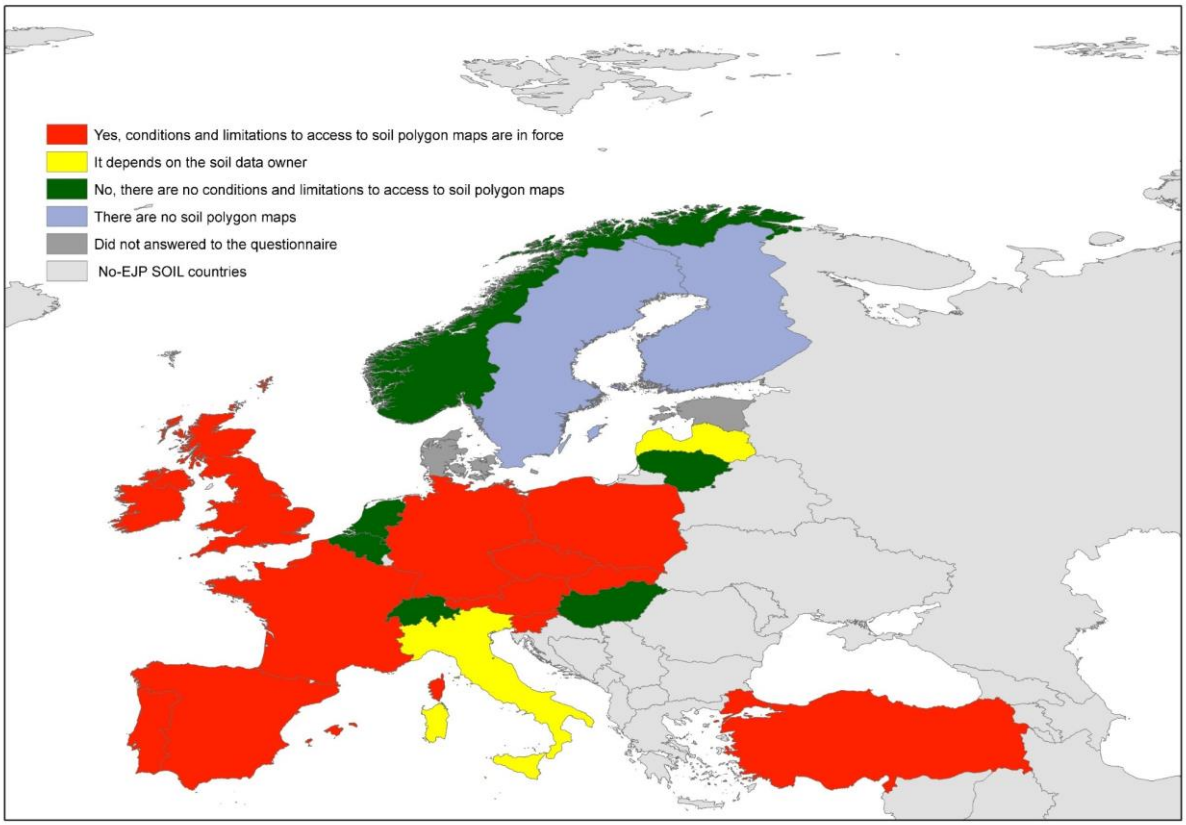

Figure 15 Presence of conditions and limitations to access to soil polygon maps owned by EJP SOIL institutions

Table 36 Conditions and limitations to access to soil polygon maps owned by institutions responding to the questionnaire in the EJP SOIL countries

State	Conditions and limitations to access as identified in the green frame at pages 129-130													
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
AT														x
CZ			x											
DE														x
ES			x		x									
FR	x													
IE			x											
IT**1**			x	x						x				
L**V2**	x								x					
LV**3**														x
PL														x
PT				x										
SI														x
SK				x										
TR														x

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

UK	x	x												
Total **per country**	3	1	4	3	1				1	1				6

IT1 = CREA ; LV2 = The State Plant Protection Service. LV3 = the Ministry of Agriculture-Real Estate

Austria, Germany, the Ministry of Agriculture-Real Estate of Latvia, CREA (Italy), Poland, Slovenia, and UK added further conditions and limitations in free text space, which are reported in the table 37.

Table 37 Further conditions and limitations to access to soil polygon maps owned by institutions responding to the questionnaire in the EJP SOIL countries

State	Further conditions and limitations specified in free text space
AT	Limitations concerning shapefiles in case of Austrian soil map. They have to be purchased for use.
DE	This is case specific.
IT**1**	The data can be published, but the reference to the intellectual property should be given to the authors.
LV**3**	There is some public data displayed, but the whole set of data can be accessed under special permission for specific territory.
PL	License-based
SI	The access is given depending on the data collection framework or participation in research activities/projects.
TR	To apply data sharing rules of the data owner Institutions
UK	Some soil polygon datasets are freely available, but institutions retain IP eg: National soil map of Scotland : https://www.hutton.ac.uk/learning/natural-resource-datasets/soilshutton/soils-maps-scotland/download#soilmapdata

IT1 = CREA ; LV3 = the Ministry of Agriculture-Real Estate

The final question of this slot (**Q50**) was directed to collect information on the possible incentives for sharing the soil polygon maps owned by the single national institutions. This question was open to all the countries, included the ones which have declared they do not put conditions in the sharing of the soil polygon maps. Countries were requested to opt according to the same multiple choices as for **Q47**. Only Czech Republic declared that there is no incentive for sharing the soil polygon maps owned by national institutions, and Belgium declared that they apply an open data policy. Hungary did not reply. Finland and Sweden do not have polygon maps. The most chosen options were the second and the third. Detailed replies are shown in the table 38.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

Table 38 Possible incentives for sharing soil polygon maps owned by institutions responding to the questionnaire in the EJP SOIL countries

State	Incentives for sharing soil point observations with coordinates			
	economic payment	signed mutual agreements	permanent collaboration	other
AT	x			x
BE-FL				x
CH		x	x	
DE		x	x	x
ES		x	x	
FR		x		
IE		x		
IT		x	x	
LT		x	x	
LV		x		x
NL				x
NO	x			
PL	x	x	x	
PT				x
SK	x			
TR		x		x
UK	x	x	x	
TOTAL	5	11	7	8

If countries opted for the "other" option, then a specification has been delivered. Which are reported in the table 39.

Table 39 Further specifications on incentives for sharing soil polygon maps owned by institutions responding to the questionnaire in the EJP SOIL countries

State	Further specifications on incentives for sharing
AT	An economic payment is given to soil data owners, In case of shp-files of Austrian map
BE-FL	Other: open data policy
DE	Coordinates cannot be shared, if this is not in agreement with the landowner/tenant. Informing landowners / tenants that soil data will be published georeferenced with precise coordinates will significantly reduce acceptance for data collection.
IT**1**	Signed mutual agreements inside projects
IT2	Signed mutual agreements inside projects, the establishment of a permanent collaboration formally recognized

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

IT3	We provide our data (no incentives needed)
LV1	We provide our data (no incentives needed)
LV2	Signed mutual agreements inside projects, Information is provided to the public administrations upon request
LV3	Special request form has to be filled
NL	Contract with the State for the costs to update, deliver and maintain the data for the Soil Map of The Netherlands, Geomorphological Map of The Netherlands, Ground Water Table Depths of The Netherlands and related soil point observations
PT	Informal agreements
TR	Other: to apply data sharing rules of the data owner Institutions

IT1 = CREA ; IT2 = ERSAF ; IT3, Consorzio Lamma ; LV1 = University of Latvia (UL) ; LV2 = The State Plant Protection Service. LV3 = the Ministry of Agriculture-Real Estate

As compared to the soil point data, less condition to share soil polygon data were identified : the data can be published online and used to produce maps, or other land evaluations, given that the data owner has been cited and keep informed; the data can be published online, but under a specific license (e.g. Creative Commons, or others), and after the recognition of intellectual property rights. The signing of mutual agreement was again the mayor incentive, followed by the establishment of a permanent collaboration.

The third slot of this section (**Q51**, **Q52** and **Q53**) aimed at investigating if there are conditions and limitations to access to the soil grids owned by each national institution and which are the possible incentives for sharing such soil grids.

Q51. Are there conditions and limitations to access to the soil grids owned by your institution (we do not refer here to soil data that your institution has received by other soil data owners, under mutual agreement) ?

Q52. If you answered yes in the previous question, which one of the following conditions and limitations apply to the soil grids owned by your institution (more than one answer possible) ?

Q53. Which are the possible incentives for sharing the soil grids owned by your institution (more than one answer possible) ?

The results of the first question (**Q51**) showed (figure 16) that 13 countries (Czech Republic, Germany, Spain, France, Lithuania, Netherlands, Norway, Poland, Portugal, Slovenia, Slovakia, Turkey, and UK) opted for a positive answer declaring that conditions and limitations to access to the soil grids owned by institutions are in force. For Italy and Latvia differentiated answers were given by different soil data owners. CREA, for Italy, declared that conditions and limitations were in force, while ERSAF and Consorzio Lamma declared not. The State Plant Protection Service, and the Ministry of Agriculture-Real Estate of Latvia declared that conditions and limitations were in force, while the University of

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

Latvia declared not. Austria, Belgium, Switzerland, Hungary, Ireland, and Sweden gave a negative answer (no conditions and limitations to access). Finland declared that they do not own soil grids.

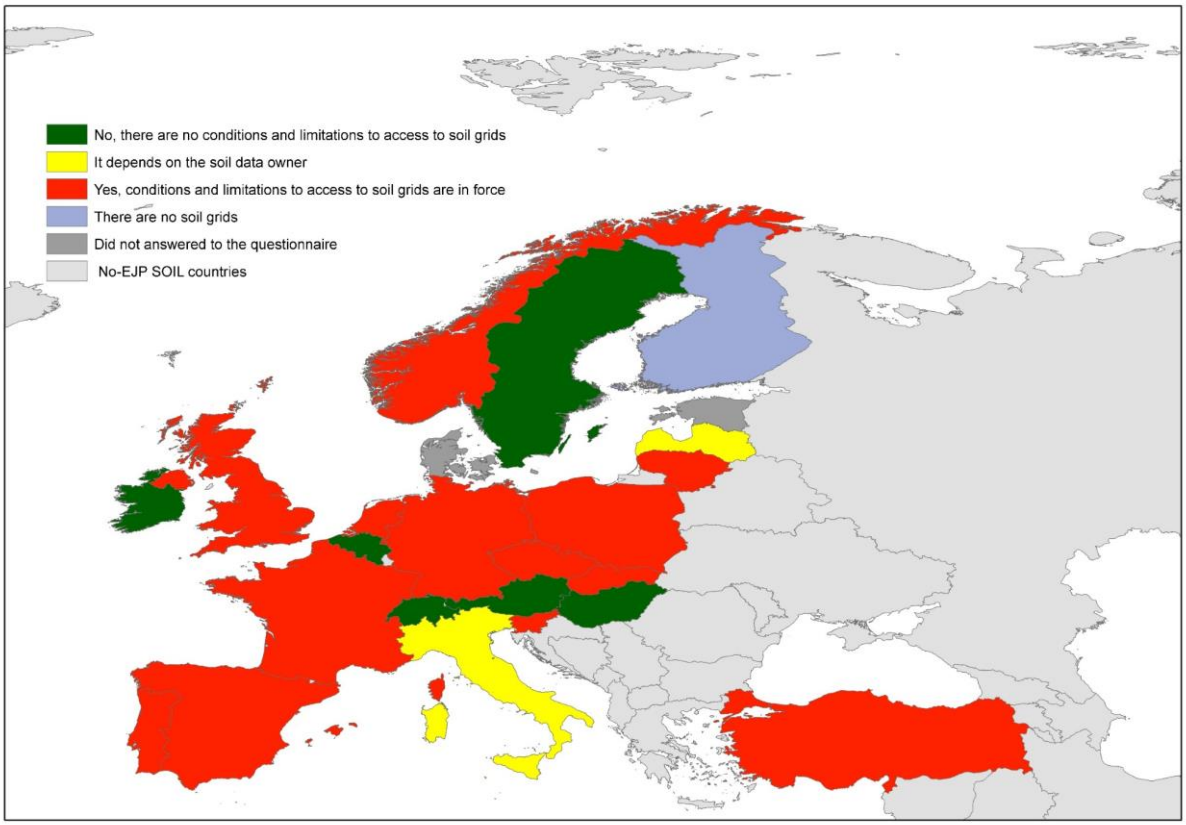

Figure 16 Presence of conditions and limitations to access to soil grids owned by EJP SOIL institutions

The countries which answered positively have been requested to specify the conditions and limitations according to multiple choices (more than one option is possible) identified for the questionnaire **(Q52)**, which are the same list as for the question Q45.

The table 40 the conditions and the limitations options according to the single country which has opted for a positive answer.

Table 40 Conditions and limitations to access to soil grids owned by institutions responding to the questionnaire in the EJP SOIL countries.

State	Conditions and limitations to access as identified in the green frame at pages 129-130													
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
CZ		x												
DE														x
ES			x		x									
FR														x

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

IT**1**			x	x						x				
LT	x	x												
LV**2**	x								x					
LV3														x
NL		x												
NO											x			
PL														x
PT					x									x
SI														x
SK														x
TR														x
UK		x								x				
Total per country	2	4	2	1	2	0	0	0	1	1	1	0	0	8

IT1 = CREA ; LV2 = The State Plant Protection Service ; LV3 = the Ministry of Agriculture-Real Estate

Germany, France, CREA (Italy), the Ministry of Agriculture-Real Estate of Latvia, Slovenia, Slovakia, and Turkey added further specifications to the conditions and limitations in free text space. They are reported in the table 41.

Table 41 Further conditions and limitations to access to soil grids owned by institutions responding to the questionnaire in the EJP SOIL countries

State	Further conditions and limitations specified in free text space
DE	This is case specific
FR	It depends on the source of the data
IT**1**	The data can be published, but the reference to the intellectual property should be given to the authors.
LV3	There is some public data displayed, but the whole set of data can be accessed under special permission for specific territory.
PL	License based.
PT	Signature of term of responsibility
SI	The access is given depending on the data collection framework.
SK	At present, the NPPC-VUPOP does not publish any soil grid data
TR	To apply data sharing rules of the data owner Institutions

IT1 = CREA ; LV3 = the Ministry of Agriculture-Real Estate

The final question of this slot (**Q53**) was directed to collect information on the possible incentives for sharing the soil grids owned by the single national institutions. This question was open to all the countries, either the ones which have declared they do not put conditions in the sharing of the soil grids. Countries were requested to opt according to the same multiple choices as for **Q47**. Austria, Czech Republic, Consorzio Lamma of Tuscany (Italy), the University of Latvia, Sweden, and Slovenia,

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

declared that they do not need incentives for sharing the soil grids owned by their institutions, and Austria underlined that there are only very few grid soil data sets in Austria available. Belgium declared that they apply an open data policy. Hungary did not reply. Finland does not have soil grids. All the other respondents give an indication to incentives for sharing of soil grids. Replies demonstrate that "signed mutual agreements inside projects" and "the establishment of a permanent collaboration formally recognized" are the most common incentives for sharing the soil grids data. Detailed replies are shown in the table 42.

Table 42 Possible incentives for sharing soil grids owned by institutions responding to the questionnaire in the EJP SOIL countries

State	Incentives for sharing soil point observations with coordinates			
	economic payment	signed mutual agreements	permanent collaboration	other
BE-FL				x
CH		x	x	
DE		x	x	
ES		x	x	
FR		x		
IE		x		
IT		x	x	
LT		x	x	
LV				x
NL	x			
NO	x			
PL	x	x	x	
PT			x	
TR		x		
UK	x	x	x	
TOTAL	4	10	8	2

If countries opted for the "other" option, then a specification has been delivered and is reported in the table 43.

Table 43 Further specifications on incentives for sharing soil grids owned by institutions responding to the questionnaire in the EJP SOIL countries

State	Further specifications on incentives for sharing
BE-FL	Open data policy
LV1	We provide our data (no incentives needed)
LV2	Signed mutual agreements inside projects, Information is provided to the public administrations upon request

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

LV3	Special request form has to be filled

LV1 = University of Latvia (UL) ; LV2 = The State Plant Protection Service. LV3 = the Ministry of Agriculture-Real Estate

For the sharing of soil grids there were even less conditions as compared to soil polygon data. The mayor condition was that the data could be published online and used to produce maps, or other land evaluations, given that the data owner has been cited and keep informed. The publishing under specific licences and after recognition of intellectual property rights was also underlined. Mayor incentives for the sharing of soil grids were again the signing of mutual agreements, followed by the establishment of a permanent collaboration.

The last 2 questions of the questionnaire (**Q54** and **Q54**) were dedicated to best conditions during the soil sampling.

Q54. Which kind of legal authorization is needed for soil sampling in your country, region and/or federal state ?

Q55. Which kind of agreements do you make with landowners about publishing and sharing the results of the sampling campaign that took place on their land ?

The questions **Q54** aimed at investigating which kind of legal authorization is needed for soil data sampling in each country, region and/or federal state. As the question was free text it is relevant to report each reply. It is worth to mention that most of the country refers that a permission to landowners to collect soil or a kind of consent/agreement with the landowners is requested. The results are reported in the table 44.

Table 44 Legal authorization needed for soil sampling

State	Legal authorization for soil sampling in free text
AT	Is implemented partly in some of the soil protection laws of single federal provinces ; is individually handled in cooperation with landowners – a difficult issue and cannot be regulated on federal level. Only the soil taxation service is permitted to get access to sampling sites at any time.
BE-FL	Informed consent
CH	The Swiss Federal law for the environment obliges the duty to collect the data onto the federal and cantonal executive authorities, without explicitly naming access to the site. This question needs to be further investigated.
CZ	Agreement of the landowners.
DE	Depends on the specific location for taking the soil sample and ranges from landowner permits to government permits.
ES	Specific authorization is not needed, apart from access rights to the private property land.
FI	No legal authorization is involved in Valse sampling.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

FR	It is necessary to have the agreement of the landowner.
IE	None
IT	For the moment, any specific procedure or authorization is provided as mandatory for survey carrying out soil sampling activity; informal agreements with landowners are usually issued
LT	Agreement with the landowners. In most cases verbal agreement with landowners is sufficient.
LV	Need to be coordinated with landowner In accordance with Cabinet Regulation No. 833 (Adopted 5 October 2004) "Procedures by which the Information Regarding the Fertility Level of the Agricultural Land and the Changes Thereof is Obtained and Compiled" (point 5) the State Plant Protection Service shall enter into an agreement with the owner or legal possessor of the land regarding the obtaining of information and conditions for obtaining (relating to soil agrochemical research). https://likumi.lv/ta/en/en/id/94669-procedures-by-which-the-information-regarding-the-fertility-level-of-the-agricultural-land-and-the-changes-thereof-is-obtained-and-compiled
NL	None
NO	None
PL	Question unclear
PT	There is the need to respect private property, national reserves and ask permission of landowners to collect soil.
SE	You are not obliged to acquire any legal authorization before sampling but in general, you always ask the landowner about permission before.
SK	NPPC-VUPOP uses a service card (stamped, with ID) authorizing entry (by car, by foot) to foreign real estate
TR	The Ministry of Agriculture and Forestry gives legal permission for soil sampling.
UK	There are no legal restrictions for the collection of soil data in the UK (apart from that which would apply to environmentally protected sites or restricted military or similar locations). Consent from the landowner would be required to carry out the sampling unless such sampling took place under some legal authority (e.g., sampling for contamination, forensic purposes etc.).

The last question of this section (**Q55**) was devoted to collecting information on the types of agreements which are made with landowners about publishing and sharing the results of the sampling campaign. As the question was free text it is relevant to report each reply. Portugal and Turkey didn't give any answers to this question. The 45 shows the results.

Table 45 Types of agreements made with landowners about the publishing and sharing of the results of the sampling campaigns.

State	Description of the agreements

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

AT	Is within the competence of the provincial authorities for some kinds of soil information. For others (Austrian soil map) no agreements have been obtained.
BE-FL	informed consent
CH	The Swiss Federal law for the environment obliges the duty to collect the data onto the federal and cantonal executive authorities, without explicitly naming access to the site
CZ	The landowner's agreement is generally linked to the use of the samples and results for scientific purposes only without more detailed specifications
DE	Depends on how the data will be published and shared; usually declarations of consent in consideration of the Regulation (EU) 2016/679 on General Data Protection (GDPR)
ES	The most common kind of agreements are oral and on a voluntary basis. Informing landowners of the purpose of the campaign and not showing the exact location of the sample plot
FI	The sampling campaign and its aims are first announced in a newspaper with wide distribution among farmers and in Institute's web pages. In the announcement it is indicated that the data will be used only for the purposes of the monitoring study and that in the reporting of the results it is not possible to identify the results of a particular field or link the results to the landowner. It is further promised that the landowner will receive the result of her/his own field. The field crews try to meet each landowner/farmer before sampling for a permission to enter the field and to introduce the study. A paper document where the above information is included is given to the landowner/farmer. When the landowner is not reached, the written document is left in the house and the samples are taken (this procedure has caused no complaints). The sampling is based on "gentleman's agreement", no formal agreement on the sampling and usage of the data is made
FR	Generally, the agreement stipulates that no personal data will be shared (coordinates, name of the landowner) and explains the purposes of the sampling campaign
HU	The soil sampling, data processing and publishing are insured by State law. Landowners are obliged to make their land accessible for authorized soil conservation officers.
IE	Their point data cannot be published
IT	Usually and subject to exceptions data should be processed and published in an anonymized and aggregated form. The landowners, otherwise, may no agree in the publication of their data
LT	When landowners give consent to take soil samples, they agree for data publishing
LV	In accordance with Cabinet Regulation No.35 (Adopted 17 January 2017) "Zemes pārskatā iekļaujamās informācijas sagatavošanas kārtība"/Procedure for Preparation of Information to be Included in the Land Report (point 3 of the Annex) only a summary of the data is published. The results of individual farms are not published. https://likumi.lv/ta/id/288233-zemes-parskata-ieklaujamas-informacijas-sagatavosanas-kartiba
NL	Landowners are informed by a letter of Wageningen Environmental Research acting as National Soil Survey and then asked for permission (which in over 95% is given).

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

	Permission includes publication within Basisregistratie Ondergrond (BRO, Basic Registration of the Substrate https://basisregistratieondergrond.nl/[26])
NO	Data is freely available. Certain exact locations of points and grids are secret as they form pars in a national survey programme. There are no formal arrangements on publishing and data sharing. Landowners are informed of sampling campaigns before, during and after field work.
PL	None
SE	You are not obliged to acquire any legal authorization before sampling but in general, you always ask the landowner about permission before.
SK	Individual request on results like the form of LUCAS soil sampling (marked within field form LUCAS survey campaign)
UK	Currently, permission would have to be sought from the landowner to publish any data as a result of soil sampling. Privacy notices will indicate to the participants any potential sharing of data. Usually, assurance will be given that the data will not be published in such a way that any individual can be identified

3.6.1 Results of the analysis of the section F

RESULTS IN A NUTSHELL

As to the specific section F) on soil data sharing, the obstacles and barriers outlined by the questionnaire results are the following:

- Soil point data usually are shared at the condition that the coordinates are decreased in accuracy otherwise they cannot be published online, and at the condition that the soil data owners are involved in the mapping elaborations. The ground for these conditions are found in the protection of personal property and personal data. The recognition of intellectual property rights is also recognised as a mayor condition. The signing of a mutual agreement is the main incentive for soil point data sharing, followed by the establishment of a permanent collaboration.
- As compared to the soil point data, less conditions to share soil polygon data were indicated : the data can be published online and used to produce maps, or other land evaluations, given that the data owner has been cited and kept informed; the data can be published online, but under a specific license (e.g., Creative Commons, or others), and the data can be published online given the recognition of intellectual property rights. The signing of a mutual agreement was again the mayor incentive, followed by the establishment of a permanent collaboration.
- For the sharing of soil grids there were even less conditions as compared to soil polygon data. The mayor condition was the data could be published online and used to produce maps, or other land evaluations, given that the data owner has been cited and kept informed. The publishing under specific licences and after recognition of intellectual property rights was also

[26] This is the website of the Subsurface Basic Registration Programme. The program is working on a national facility with reliable information about the Dutch soil and subsoil that is accessible to everyone.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

indicated. Mayor incentives for the sharing of soil grids were again the signing of mutual agreements, followed by the establishment of a permanent collaboration.

- The recognition of an economic payment is recognised as incentive only by few countries, and it is recognised more for elaborated products such as soil polygon and raster maps then for basic soil point data.
- The need of an agreement with landowners for soil sampling is commonly recognised.

Some suggestions for best practices in the soil data sharing can be obtained analysing the results of the section F of the questionnaire. The suggestions are the following :

- It is obligatory for some countries/regions, and would be a desirable practice in general, to have the consent from landowners in case of publishing online the soil point data with exact coordinates.
- It is a common practice to adopting anonymization procedure for soil point data, such as the decreasing coordinates accuracy when publishing online, or aggregating soil point data in areal land evaluations, where soil properties are attributed not to a specific location, instead to a wider piece of land and with statistical ranges.
- To adopt a 'bottom-up' approach in the soil mapping activities, always involving the national/regional/federal-state soil data officers/services (official or not), similarly as it is adopted by the pillar 4 of the Global Soil Partnership. Since soil data may be scattered inside the same nation/region among different soil data holders/owners, there can be the need to establish networks of institutions involved in the mapping. This process should be accompanied by the signing of mutual agreements inside single projects initiatives, in the vision to establish permanent collaborations with clear rules.
- The recognition of intellectual property rights to the authors of soil map elaborations (polygon or grid ones).
- The recognition of economic payments and/or financing in order to maintain alive the national/regional/federal state soil mapping and monitoring services.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

4. Comparative analysis at national level

4.1 Austria

Member State	**Directive 2003/04/EC** transposed	**Directive 2007/02/EC** transposed
State Structure Federal State of 9 States		**Soil ownership structure** No official soil officer but mapping services. BORIS - soil information system: the Federal Environment Agency offers soil data from the federal states and the federal government in a comparable and quality-checked form online. https://www.umweltbundesamt.at/boris Austrian soil map, www.bodenkarte.at.
INSPIRE contact point		Federal Ministry for Agriculture, Regions and Tourism https://www.bmlrt.gv.at/
INSPIRE metadata portals and network services		https://www.inspire.gv.at https://www.geoland.at
INSPIRE Geoportal Number of published soil datasets		National: 9 Regional: 0
SOIL DATA SHARING POLICIES points		Cannot be published online, it adversely affects the confidentiality of the proceedings of public authorities.
SOIL DATA SHARING POLICIES polygons		Limitations concerning shapefiles in case of Austrian soil map. They have to be purchased for use.
SOIL DATA SHARING POLICIES grids		None

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

4.2 Belgium

Member State	**Directive 2003/04/EC** transposed	**Directive 2007/02/EC** transposed
State Structure Federal State of 3 Autonomous Regions		**Soil ownership structure** Regional Soil Information Officers For Region of Flanders: Flemish Planning Bureau for the Environment and Spatial Development (VPO: soil data) https://omgeving.vlaanderen.be/afdeling-vlaams-planbureau-voor-omgeving-vpo; Openbare Afvalstoffen Maatschappij (OVAM: soil pollution data) https://www.vlaanderen.be/organisaties/administratieve-diensten-van-de-vlaamse-overheid/beleidsdomein-omgeving/openbare-vlaamse-afvalstoffenmaatschappij
INSPIRE contact point		Agency for Geographical Information Flanders www.agiv.be
INSPIRE metadata portals and network services		https://www.dov.vlaanderen.be/geonetwork/srv/dut/catalog.search#/home
INSPIRE Geoportal Number of published soil datasets		National: 0 Regional: 21
SOIL DATA SHARING POLICIES points		The public access cannot be given because it adversely affects the interest or protection of any person who supplied the information requested on a voluntary basis without being under, or capable of being put under, a legal obligation to do so, unless that person has consented to the release of the information concerned. The data can be published online and used to produce maps, or other land evaluations but the exact coordinates must be hidden because the exact location of monitoring points must remain secret.
SOIL DATA SHARING POLICIES polygons		None
SOIL DATA SHARING POLICIES grids		None

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

4.3 Switzerland

EFTA member	**Directive 2003/04/EC** not transposed but Aarhus convention adopted	**Directive 2007/02/EC** not transposed special law on geoinformation, Federal Act of 5 October 2007
State Structure Federal State, Confederation of 26 Cantons	**Soil ownership structure** Swiss Federal Office for the Environment, https://www.bafu.admin.ch/bafu/en/home.html; Centro di competenze per il suolo, https://ccsols.ch/it/home-italiano/.	
INSPIRE contact point	Swiss Federal Office of Topography https://www.swisstopo.admin.ch/	
INSPIRE metadata portals and network services	https://map.geo.admin.ch/	
INSPIRE Geoportal Number of published soil datasets	National: 0 Regional: 0	
SOIL DATA SHARING POLICIES points	The usage of cantonal data has to be granted by the corresponding cantons previously. The coordinates of some data points might have been randomized/rounded. Some data might not be publicly available, such as soil pollution data.	
SOIL DATA SHARING POLICIES polygons	None	
SOIL DATA SHARING POLICIES grids	None	

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

4.4 Czech Republic

Member State	**Directive 2003/04/EC** transposed	**Directive 2007/02/EC** transposed
State Structure Unitary State with Regions	**Soil ownership structure** Research Institute for Soil and Water Conservation, https://www.vumop.cz/en; Forest Management Institute, http://www.uhul.cz/home; Central Institute for Supervising and Testing in Agriculture, http://eagri.cz/public/web/en/ukzuz/portal/; Czech geological Survey, http://www.geology.cz/extranet-eng.	
INSPIRE contact point	Czech Environmental Information Agency https://www.cenia.cz/#aktuality_	
INSPIRE metadata portals and network services	https://metadata.vumop.cz/ https://geoportal.gov.cz/	
INSPIRE Geoportal Number of published soil datasets	National: 1 Regional: 0 Other: 3	
SOIL DATA SHARING POLICIES points	Cannot be used to produce maps, or other land evaluations, without the approval of the soil data owner and/or without his participation to the mapping elaborations	
SOIL DATA SHARING POLICIES polygons	Can be published online and used to produce maps, or other land evaluations, given that the data owner has been cited and keep informed	
SOIL DATA SHARING POLICIES grids	Cannot be used to produce maps, or other land evaluations, without the approval of the soil data owner and/or without his participation to the mapping elaborations	

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

4.5 Germany

Member State	**Directive 2003/04/EC** transposed	**Directive 2007/02/EC** transposed
State Structure Federal State of 16 States		**Soil ownership structure** BGR, https://www.bgr.bund.de/EN/Home/homepage_node_en.html Thünen, https://www.thuenen.de/en/
INSPIRE contact point		Lenkungsgremium GDI-DE (Steering Committee) https://www.gdi-de.org/
INSPIRE metadata portals and network services		https://produktcenter.bgr.de https://geoportal.de/portal/main/
INSPIRE Geoportal Number of published soil datasets		National: 16 Regional: 131 Other: 85
SOIL DATA SHARING POLICIES points		Public access cannot be given because it adversely affects the confidentiality of personal data and/or files relating to a natural person where that person has not consented to the disclosure of the information to the public, where such confidentiality is provided by national or Community law. The public access cannot be given because it adversely affects the interest or protection of any person who supplied the information requested on a voluntary basis without being under, or capable of being put under, a legal obligation to do so, unless that person has consented to the release of the information concerned. The data is provided but its geolocation accuracy was decreased to not provide landowner information.
SOIL DATA SHARING POLICIES polygons		This is case specific.
SOIL DATA SHARING POLICIES grids		This is case specific.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

4.6 Denmark

Member State	**Directive 2003/04/EC** transposed	**Directive 2007/02/EC** transposed
State Structure Unitary State with Regions	**Soil ownership structure** (info retrieved from web) The Danish Forest and Nature Agency https://eng.naturstyrelsen.dk/	
INSPIRE contact point	Agency for Data Supply and Efficiency https://sdfe.dk/	
INSPIRE metadata portals and network services	https://www.geodata-info.dk/srv/dan/catalog.search#/home https://www.miljoeportal.dk/	
INSPIRE Geoportal Number of published soil datasets	National: 1 Regional: 0	
SOIL DATA SHARING POLICIES points	Unknown	
SOIL DATA SHARING POLICIES polygons	Unknown	
SOIL DATA SHARING POLICIES grids	Unknown	

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

4.7 Spain

Member State	**Directive 2003/04/EC** transposed	**Directive 2007/02/EC** transposed
State Structure Unitary State but divided into 17 Autonomous Communities	**Soil ownership structure** The Ministry for Ecological Transition and Demographic Challenge https://www.miteco.gob.es/en/	
INSPIRE contact point	National Geographic Institute http://www.ign.es/web/ign/portal	
INSPIRE metadata portals and network services	https://www.idee.es/ https://www.idee.es/visualizador/	
INSPIRE Geoportal Number of published soil datasets	National: 5 Regional: 0	
SOIL DATA SHARING POLICIES points	Can be published online and used to produce maps, or other land evaluations, given that the data owner has been cited and keep informed. The data can be published online, but under a specific license. The public access cannot be given because it adversely affects the confidentiality of personal data and/or files relating to a natural person where that person has not consented to the disclosure of the information to the public, where such confidentiality is provided by national or Community law. The public access cannot be given because it adversely affects the interest or protection of any person who supplied the information requested on a voluntary basis without being under, or capable of being put under, a legal obligation to do so, unless that person has consented to the release of the information concerned.	
SOIL DATA SHARING POLICIES polygons	Can be published online and used to produce maps, or other land evaluations, given that the data owner has been cited and keep informed. The data can be published online, but under a specific license	
SOIL DATA SHARING POLICIES grids	Can be published online and used to produce maps, or other land evaluations, given that the data owner has been cited and keep informed. The data can be published online, but under a specific license.	

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

4.8 Estonia

Member State	**Directive 2003/04/EC** transposed	**Directive 2007/02/EC** transposed
State Structure Unitary State	**Soil ownership structure** (info retrieved from web) Estonian Land Board https://maaamet.ee/ the Ministry of the Environment https://www.envir.ee/en	
INSPIRE contact point	Estonian Land Board https://maaamet.ee/	
INSPIRE metadata portals and network services	https://metadata.geoportaal.ee/geonetwork/srv/est/catalog.search#/home https://geoportaal.maaamet.ee/est/INSPIRE/Eesti-geoportaal-p737.html	
INSPIRE Geoportal Number of published soil datasets	National: 2 Regional: 0	
SOIL DATA SHARING POLICIES points	Unknown	
SOIL DATA SHARING POLICIES polygons	Unknown	
SOIL DATA SHARING POLICIES grids	Unknown	

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

4.9 Finland

Member State	**Directive 2003/04/EC** transposed	**Directive 2007/02/EC** transposed
State Structure Unitary State	**Soil ownership structure** ELY centers are the competent authorities regarding and maintaining information on soil pollution: https://tem.fi/en/ely-centres; Data systems and data sets of the Finnish environmental administration: https://www.ymparisto.fi/fi-fi/kartat_ja_tilastot/tietojarjestelmat; Finnish Environment Institute: https://www.syke.fi/fi-FI/Avoin_tieto/Paikkatietoaineistot/Ladattavat_paikkatietoaineistot. Geological Survey of Finland (GTK) https://www.gtk.fi/en/front-page/; National Land Survey of Finland: https://www.maanmittauslaitos.fi/en/e-services/geodata-portal-paikkatietoikkuna.	
INSPIRE contact point	Ministry of Agriculture and Forestry https://mmm.fi/etusivu	
INSPIRE metadata portals and network services	https://ckan.ymparisto.fi/ https://www.syke.fi/en-US/Open_information/Open_web_services/INSPIRE_WMS_and_WFS	
INSPIRE Geoportal Number of published soil datasets	Other: 2	
SOIL DATA SHARING POLICIES points	The data cannot be published online. Cannot be used to produce maps, or other land evaluations, without the approval of the soil data owner and/or without his participation to the mapping elaborations. The public access cannot be given because it adversely affects the confidentiality of the proceedings of public authorities. Public access cannot be given because it adversely affects the confidentiality of personal data and/or files relating to a natural person where that person has not consented to the disclosure of the information to the public, where such confidentiality is provided by national or Community law.	

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

	Tthe public access cannot be given because it adversely affects the interest or protection of any person who supplied the information requested on a voluntary basis without being under, or capable of being put under, a legal obligation to do so, unless that person has consented to the release of the information concerned. If a legal consultation indicated that the data - collected from practical farms with landowner's consent – could in principle be shared, the geographical coordinates could be blurred prior the opening of the data.
SOIL DATA SHARING POLICIES polygons	There are no soil polygons
SOIL DATA SHARING POLICIES grids	There are no soil grids

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

4.10 France

Member State	**Directive 2003/04/EC** transposed	**Directive 2007/02/EC** transposed
State Structure Unitary State with Regions	**Soil ownership structure** The Ministry for Food and Agriculture and the Ministry for an Ecological Transition support the "GIS SOL" consortium ("groupement d'intérêt scientifique sol", https://www.gissol.fr/) grouping : INRAE https://www.inrae.fr/en, ADEME https://www.ademe.fr/, BRGM https://www.brgm.fr/fr, IGN https://dash4it.co.uk/uk-maps./publisher-brand/ign-institut-geographique-national-fr.html, IRD https://www.ird.fr/, and OFB https://ofb.gouv.fr/.	
INSPIRE contact point	Ministry of Ecology, Sustainable Development and Energy https://www.ecologie.gouv.fr/	
INSPIRE metadata portals and network services	https://agroenvgeo.data.inra.fr/geonetwork/srv/ita/catalog.search#/home www.geocatalogue.fr Several metadata portals also at regional level	
INSPIRE Geoportal Number of published soil datasets	National: 0 Regional: 0	
SOIL DATA SHARING POLICIES points	The data cannot be published online. The data can be published online and used to produce maps, or other land evaluations, but some sensitive data must be hidden. Tthe public access cannot be given because it adversely affects the international relations, public security or national defence. Public access cannot be given because it adversely affects the confidentiality of personal data and/or files relating to a natural person where that person has not consented to the disclosure of the information to the public, where such confidentiality is provided by national or Community law. The public access cannot be given because it adversely affects the interest or protection of any person who supplied the information requested on a voluntary basis without being under, or capable of being put under, a legal obligation to do so, unless that person has consented to the release of the information concerned.	

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

	The public access cannot be given because it adversely affects the protection of the environment to which such information relates, such as the location of rare species.
SOIL DATA SHARING POLICIES polygons	The data cannot be published online
SOIL DATA SHARING POLICIES grids	It depends on the source of the data

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

4.11 Hungary

Member State	**Directive 2003/04/EC** transposed	**Directive 2007/02/EC** transposed
State Structure Unitary State with Counties	**Soil ownership structure** Soil conservation officers are run by the County Governmental Offices covering the whole country. https://portal.cor.europa.eu/divisionpowers/Pages/Hungary-Intro.aspx; National Food Chain Safety Office, http://www.escaa.org/index/action/page/id/6/title/agency-by-country/country/HU; Directorate of Plant Protection, Soil Conservation and Agri – Environment, https://portal.nebih.gov.hu/hu/web/english/hungarian-forest-management/-/asset_publisher/pHBk9pq6UNxK/content/directorate-of-plant-protection-and-soil-conservation/contacts; MTA-ATK Agricultural Research Center, http://www.atk.hu/hu; and the Universities.	
INSPIRE contact point	Department of Land Administration, Ministry of Agriculture, Hungary http://en.foldhivatal.hu/	
INSPIRE metadata portals and network services	https://inspire.gov.hu/	
INSPIRE Geoportal Number of published soil datasets	National: 0 Regional: 0	
SOIL DATA SHARING POLICIES points	None	
SOIL DATA SHARING POLICIES polygons	None	
SOIL DATA SHARING POLICIES grids	None	

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

4.12 Ireland

Member State	**Directive 2003/04/EC** transposed	**Directive 2007/02/EC** transposed
State Structure Unitary State with Counties	**Soil ownership structure** Teagasc, https://www.teagasc.ie/; EPA, https://www.epa.ie/; Department of the Environment, Climate and Communications, https://www.gov.ie/en/organisation/department-of-the-environment-climate-and-communications/	
INSPIRE contact point	Department of Housing, Planning and Local Government https://www.gov.ie/en/organisation/department-of-housing-local-government-and-heritage/?referrer=http://www.housing.gov.ie/#	
INSPIRE metadata portals and network services	https://inspire.geohive.ie/geoportal/#searchPanel https://inspire.geohive.ie/geoportal/#mapPanel	
INSPIRE Geoportal Number of published soil datasets	National: 0 Regional: 0	
SOIL DATA SHARING POLICIES points	The public access cannot be given because it adversely affects the confidentiality of personal data and/or files relating to a natural person where that person has not consented to the disclosure of the information to the public, where such confidentiality is provided by national or Community law. The public access cannot be given because it adversely affects the interest or protection of any person who supplied the information requested on a voluntary basis without being under, or capable of being put under, a legal obligation to do so, unless that person has consented to the release of the information concerned.	
SOIL DATA SHARING POLICIES polygons	None	
SOIL DATA SHARING POLICIES grids	None	

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

4.13 Italy

Member State	**Directive 2003/04/EC** transposed	**Directive 2007/02/EC** transposed
State Structure Unitary State with Regions	**Soil ownership structure** The National Observatory for Pedology (Osservatorio Nazionale Pedologico) which is grouping: the Ministry of Agriculture and Forestry https://www.politicheagricole.it/; the Ministry of Ecological Transition https://www.mite.gov.it/; the 20 Italian Regions (the departments in each region either from agriculture or from environment), CREA https://www.crea.gov.it/en/home; ISPRA https://www.isprambiente.gov.it/it; CNR https://www.cnr.it/en; the Regional Agencies for Environmental Protection (ARPA) https://www.snpambiente.it/chi-siamo/i-nodi-del-sistema/i-siti-web/ and the Universities.	
INSPIRE contact point	Ministry of Ecological Transition https://www.mite.gov.it/	
INSPIRE metadata portals and network services	http://www.pcn.minambiente.it/mattm/catalogo-metadati/ http://geoportale.isprambiente.it/sfoglia-il-catalogo/, Several metadata portals also at regional level	
INSPIRE Geoportal Number of published soil datasets	National: 0 Regional: 178 Other: 192	
SOIL DATA SHARING POLICIES points	The data cannot be published online. Cannot be used to produce maps, or other land evaluations, without the approval of the soil data owner and/or without his participation to the mapping elaborations. The public access cannot be given because it adversely affects the confidentiality of commercial or industrial information, where such confidentiality is provided for by national or Community law to protect a legitimate economic interest, including the public interest in maintaining statistical confidentiality and tax secrecy. The public access cannot be given because it adversely affects the intellectual property rights. The public access cannot be given because it adversely affects the interest or protection of any person who	

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

	supplied the information requested on a voluntary basis without being under, or capable of being put under, a legal obligation to do so, unless that person has consented to the release of the information concerned. The reference to the intellectual property should be given to the authors of scientific papers, when available.
SOIL DATA SHARING POLICIES polygons	Can be published online and used to produce maps, or other land evaluations, given that the data owner has been cited and keep informed. The data can be published online and used to produce maps, or other land evaluations, but some sensitive data must be hidden. The public access cannot be given because it adversely affects the intellectual property rights. The data can be published, but the reference to the intellectual property should be given to the authors.
SOIL DATA SHARING POLICIES grids	Can be published online and used to produce maps, or other land evaluations, given that the data owner has been cited and keep informed. The data can be published online and used to produce maps, or other land evaluations, but some sensitive data must be hidden. The public access cannot be given because it adversely affects the intellectual property rights. The data can be published, but the reference to the intellectual property should be given to the authors.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

4.14 Lithuania

Member State	**Directive 2003/04/EC** transposed	**Directive 2007/02/EC** transposed
State Structure Unitary State with Counties	**Soil ownership structure** The Ministry of Agriculture of the Republic of Lithuania, https://zum.lrv.lt/en/; Ministry of Environment of the Republic of Lithuania, https://am.lrv.lt/en/; Lithuanian Research Centre for Agriculture and Forestry (LAMMC), https://www.lammc.lt/en; Lithuanian Institute of Agrarian Economics, https://www.laei.lt/?lng=en; Vytautas Magnus University, Agriculture Academy, https://latlit.eu/aleksandras-stulginskis-university-asu/; Lithuanian Agricultural Advisory Service, https://www.lzukt.lt/about-us/; State Enterprise Land Fund, https://www.vzf.lt/; State Enterprise "GIS-Centras", https://www.gis-centras.lt/index.php/en/; National Land Service under the Ministry of Agriculture, https://eurogeographics.org/member/national-land-service-under-the-ministry-of-agriculture/; Nature Research Centre , Geology and Geography Institute, https://gamtostyrimai.lt/en/about_us/information_about_the_research_centre; Lithuanian Geological Survey under Ministry of Environment of the Republic of Lithuania, https://www.lgt.lt/index.php/en/.	
INSPIRE contact point	Ministry of Agriculture https://zum.lrv.lt/	
INSPIRE metadata portals and network services	https://www.geoportal.lt/geoportal/web/en	
INSPIRE Geoportal Number of published soil datasets	National: 1 Regional: 0	
SOIL DATA SHARING POLICIES points	**None**	
SOIL DATA SHARING POLICIES polygons	**None**	
SOIL DATA SHARING POLICIES grids	The data cannot be published online. Cannot be used to produce maps, or other land evaluations, without the approval of the soil data owner and/or without his participation to the mapping elaborations.	

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

4.15 Latvia

Member State	**Directive 2003/04/EC** transposed	**Directive 2007/02/EC** transposed
State Structure Unitary State	**Soil ownership structure** Ministry of Agriculture, https://www.zm.gov.lv/en/; Ministry of Environmental Protection and Regional Development, https://www.varam.gov.lv/en	
INSPIRE contact point	Ministry of Environmental Protection and Regional Development https://www.varam.gov.lv/lv	
INSPIRE metadata portals and network services	https://geolatvija.lv/geo/#/ https://geometadati.viss.gov.lv/geoportal/catalog/wrapper/ivisgds.page	
INSPIRE Geoportal Number of published soil datasets	Other: 7	
SOIL DATA SHARING POLICIES points	The data cannot be published online. The public access cannot be given because it adversely affects the confidentiality of commercial or industrial information, where such confidentiality is provided for by national or Community law to protect a legitimate economic interest, including the public interest in maintaining statistical confidentiality and tax secrecy. There is some public data displayed, but the whole set of data can be accessed under special permission for specific territory.	
SOIL DATA SHARING POLICIES polygons	The data cannot be published online. The public access cannot be given because it adversely affects the confidentiality of commercial or industrial information, where such confidentiality is provided for by national or Community law to protect a legitimate economic interest, including the public interest in maintaining statistical confidentiality and tax secrecy. There is some public data displayed, but the whole set of data can be accessed under special permission for specific territory.	
SOIL DATA SHARING POLICIES grids	The data cannot be published online. The public access cannot be given because it adversely affects the confidentiality of commercial or industrial information, where such confidentiality is provided for by national or Community law to protect a legitimate economic interest, including the public interest in maintaining statistical confidentiality and tax secrecy.	

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

	There is some public data displayed, but the whole set of data can be accessed under special permission for specific territory

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

4.16 Netherlands

Member State	**Directive 2003/04/EC** transposed	**Directive 2007/02/EC** transposed
State Structure Unitary State with Provinces	**Soil ownership structure** Basic Registration of the Substrate, Basisregistratie Ondergrond, BRO https://basisregistratieondergrond.nl/ Ministry of Interior and Kingdom Affairs, https://www.government.nl/ministries/ministry-of-the-interior-and-kingdom-relations; Wageningen Environmental Research, https://www.wur.nl/; Officials from municipalities, water boards, provinces and ministries.	
INSPIRE contact point	Ministry of the Interior https://www.rijksoverheid.nl/ministeries/ministerie-van-binnenlandse-zaken-en-koninkrijksrelaties	
INSPIRE metadata portals and network services	www.nationaalgeoregister.nl www.pdok.nl, www.broloket.nl.	
INSPIRE Geoportal Number of published soil datasets	Other: 4	
SOIL DATA SHARING POLICIES points	**None**	
SOIL DATA SHARING POLICIES polygons	**None**	
SOIL DATA SHARING POLICIES grids	Cannot be used to produce maps, or other land evaluations, without the approval of the soil data owner and/or without his participation to the mapping elaborations.	

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

4.17 Norway

EFTA member	**Directive 2003/04/EC** transposed	**Directive 2007/02/EC** transposed
State Structure Unitary State with Counties	**Soil ownership structure** NIBIO - Norwegian Institute of Bioeconomy Research, https://www.nibio.no/en; Division for housing, property, spatial and agricultural statistics at SSB, Statistics Norway, https://www.ssb.no/.	
INSPIRE contact point	Kartverket, the Norwegian Mapping Authority https://kartverket.no/	
INSPIRE metadata portals and network services	https://kartkatalog.geonorge.no/?text=soil https://www.geonorge.no/en/	
INSPIRE Geoportal Number of published soil datasets	Other: 2	
SOIL DATA SHARING POLICIES points	Public access cannot be given because it adversely affects the confidentiality of personal data and/or files relating to a natural person where that person has not consented to the disclosure of the information to the public, where such confidentiality is provided by national or Community law.	
SOIL DATA SHARING POLICIES polygons	**None**	
SOIL DATA SHARING POLICIES grids	Public access cannot be given because it adversely affects the confidentiality of personal data and/or files relating to a natural person where that person has not consented to the disclosure of the information to the public, where such confidentiality is provided by national or Community law.	

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

4.18 Poland

Member State	**Directive 2003/04/EC** transposed	**Directive 2007/02/EC** transposed
State Structure Unitary State with Provinces	**Soil ownership structure** Council for Spatial Information Infrastructure The Council consists of seven Directors of various state bodies e.g. Ministry of Climate and Environment, https://www.gov.pl/web/climate; Chief Inspectorate of Environmental Protection, https://www.gios.gov.pl/en/; Chief Surveyor Chief Geologist of Poland, https://www.gov.pl/web/climate/piotr-dziadzio; https://www.pgi.gov.pl/en/psg-1/psg-2/informacja-i-szkolenia/wiadomosci-surowcowe/10222-chief-geologist-of-poland-appointed-as-government-plenipotentiary-for-national-resource-policy.html. .	
INSPIRE contact point	GUGiK, The Main Office of Geodesy and Cartography http://www.gugik.gov.pl/strona-glowna	
INSPIRE metadata portals and network services	https://dane.gov.pl/pl/dataset http://www.geoportal.gov.pl	
INSPIRE Geoportal Number of published soil datasets	Other: 2	
SOIL DATA SHARING POLICIES points	**None**	
SOIL DATA SHARING POLICIES polygons	License based.	
SOIL DATA SHARING POLICIES grids	License based.	

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

4.19 Portugal

Member State	**Directive 2003/04/EC** transposed	**Directive 2007/02/EC** transposed
State Structure Unitary State	**Soil ownership structure** Direção-Geral do Território (DGT) | Directorate-General for the Territory https://www.dgterritorio.gov.pt/?language=en	
INSPIRE contact point	Direção-Geral do Território (DGT) | Directorate-General for the Territory https://www.dgterritorio.gov.pt/?language=en	
INSPIRE metadata portals and network services	https://snig.dgterritorio.gov.pt/rndg/srv/por/catalog.search#/home https://snig.dgterritorio.gov.pt/rndg/srv/por/catalog.search#/map	
INSPIRE Geoportal Number of published soil datasets	National: 5 Regional: 3 Other: 1	
SOIL DATA SHARING POLICIES points	**None**	
SOIL DATA SHARING POLICIES polygons	The data can be published online and used to produce maps, or other land evaluations, but some sensitive data must be hidden	
SOIL DATA SHARING POLICIES grids	The data can be published online, but under a specific license**,** signature of term of responsibility.	

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

4.20 Sweden

Member State	**Directive 2003/04/EC** not transposed but Aarhus convention adopted	**Directive 2007/02/EC** transposed
State Structure Unitary State	**Soil ownership structure** Swedish Geological Survey, SGU, Sveriges geologiska undersökning, https://www.sgu.se/en/	
INSPIRE contact point	Lantmäteriet, the Swedish mapping, cadastral and land registration authority, is a public authority that belongs to the Ministry of Finance. https://www.lantmateriet.se/en/	
INSPIRE metadata portals and network services	https://www.geodata.se/geodataportalen/	
INSPIRE Geoportal Number of published soil datasets	National: 1 Regional: 0	
SOIL DATA SHARING POLICIES points	Cannot be used to produce maps, or other land evaluations, without the approval of the soil data owner and/or without his participation to the mapping elaborations. The data can be published online and used to produce maps, or other land evaluations, but some sensitive data must be hidden. The public access cannot be given because it adversely affects the interest or protection of any person who supplied the information requested on a voluntary basis without being under, or capable of being put under, a legal obligation to do so, unless that person has consented to the release of the information concerned. Coordinates must be hidden. We can approve the use of our soil point observations if the final result won't reveal the coordinates. (Or at least with an uncertainty of 50 km).	
SOIL DATA SHARING POLICIES polygons	**None**	
SOIL DATA SHARING POLICIES grids	**None**	

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

4.21 Slovenia

Member State	**Directive 2003/04/EC** transposed	**Directive 2007/02/EC** transposed
State Structure Unitary State	**Soil ownership structure** Agricultural Institute of Slovenia, University of Ljubljana, https://arhiv.kis.si/pls/kis/!kis.web?j=EN; Biotechnical Faculty, https://www.uni-lj.si/academies_and_faculties/faculties/2013052914461802/.	
INSPIRE contact point	Surveying and Mapping Authority https://www.gov.si/en/state-authorities/bodies-within-ministries/surveying-and-mapping-authority/	
INSPIRE metadata portals and network services	https://eprostor.gov.si/imps/srv/slv/catalog.search#/home http://www.geoportal.gov.si/	
INSPIRE Geoportal Number of published soil datasets	Other: 1	
SOIL DATA SHARING POLICIES points	**None**	
SOIL DATA SHARING POLICIES polygons	The access is given depending on the data collection framework or participation in research activities/projects.	
SOIL DATA SHARING POLICIES grids	The access is given depending on the data collection framework.	

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

4.22 Slovakia

Member State	**Directive 2003/04/EC** transposed	**Directive 2007/02/EC** transposed
State Structure Unitary State with Regions	**Soil ownership structure** There are a soil mapping and monitoring service, coordinated by the: Research Institute of Soil Science and Soil Protection, NPPC-VUPOP, https://www.vupop.sk/; Ministry of Environment of the Slovak Republic, https://www.minzp.sk/.	
INSPIRE contact point	Ministry of Environment https://www.minzp.sk/	
INSPIRE metadata portals and network services	https://rpi.gov.sk/client/map/records/?anytext=https://data.gov.sk/set/rpi/gmd/42337402 https://rpi.gov.sk/client/map/#inspire; http://geoportal.gov.sk	
INSPIRE Geoportal Number of published soil datasets	Other: 15	
SOIL DATA SHARING POLICIES points	The data can be published online, but under a specific license.	
SOIL DATA SHARING POLICIES polygons	The data can be published online and used to produce maps, or other land evaluations, but some sensitive data must be hidden.	
SOIL DATA SHARING POLICIES grids	At present, the NPPC-VUPOP does not publish any soil grid data.	

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

4.23 Turkey

Non Member State	**Directive 2003/04/EC** not transposed nor Aarhus convention adopted	**Directive 2007/02/EC** not transposed
State Structure Unitary State	**Soil ownership structure** Not available	
INSPIRE contact point	Republic of Turkey, Ministry of Environment and Urbanization - Directorate General of Geographic Information Systems https://csb.gov.tr/	
INSPIRE metadata portals and network services	Not available	
INSPIRE Geoportal Number of published soil datasets	None	
SOIL DATA SHARING POLICIES points	The data cannot be published online. Can be published online and used to produce maps, or other land evaluations, given that the data owner has been cited and keep informed. The data can be published online and used to produce maps, or other land evaluations, but some sensitive data must be hidden. The public access cannot be given because it adversely affects the intellectual property rights.	
SOIL DATA SHARING POLICIES polygons	To apply data sharing rules of the data owner Institutions.	
SOIL DATA SHARING POLICIES grids	To apply data sharing rules of the data owner Institutions	

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

4.24 United Kingdom

Member State up to the 31/01/2020	**Directive 2003/04/EC** transposed	**Directive 2007/02/EC** transposed
State Structure Unitary State with 4 Local Governments	**Soil ownership structure** UK, Centre for Ecology and Hydrology, https://www.ceh.ac.uk/; England & Wales, LandIS – Cranfield University, https://www.cranfield.ac.uk/themes/environment-and-agrifood/landis; Scotland, James Hutton Institute, https://www.hutton.ac.uk/; Northern Ireland, Agri-Food and Biosciences Institute, AFBI, https://www.afbini.gov.uk/.	
INSPIRE contact point	Not available	
INSPIRE metadata portals and network services	https://ckan.publishing.service.gov.uk/dataset; https://data.gov.uk/dataset/ea1442bf-ba77-42cc-80e7-2ea339ccb28a/natmap-national-soil-map; https://data.gov.uk/dataset/7ea11e13-23db-4174-9dba-b1b635704051/afbi-soil-series-map-of-northern-ireland-metadata; https://data.gov.uk/dataset/6c3dfc6f-98c8-48c6-ae66-2e4c20ed26c9/national-soil-map-of-scotland https://naturalengland-defra.opendata.arcgis.com/; http://mapapps2.bgs.ac.uk/ukso/home.html; https://www.spatialni.gov.uk/; https://map.environment.gov.scot/sewebmap/; https://lle.gov.wales/home.	
INSPIRE Geoportal Number of published soil datasets	None	
SOIL DATA SHARING POLICIES points	The data cannot be published online. Cannot be used to produce maps, or other land evaluations, without the approval of the soil data owner and/or without his participation to the mapping elaborations. The public access cannot be given because it adversely affects the intellectual property rights. Some soil datasets are freely available, but institutions retain IP eg: UKCEH Countryside survey soils (England and Wales), https://countrysidesurvey.org.uk/content/data-access; GMEP/ERAMMP soil monitoring (Wales), https://catalogue.ceh.ac.uk/documents/ 0fa51dc6-1537-4ad6-9d06-e476c137ed09;	

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

	BioSOIL (England and Wales), https://map.bgs.ac.uk/arcgis/services/UKSO/UKSO_Forest_Research/MapServer/WmsServer?request=getCapabilities&service=WMS; National Soil Inventory of Scotland (1978-88), https://www.hutton.ac.uk/learning/natural-resource-datasets/soilshutton/soils-maps-scotland/download; TELLUS Regional A & S Soils (Northern Ireland), https://www.bgs.ac.uk/gsni/tellus/data_licensing/index.html.
SOIL DATA SHARING POLICIES polygons	The data cannot be published online. Cannot be used to produce maps, or other land evaluations, without the approval of the soil data owner and/or without his participation to the mapping elaborations. Some soil polygon datasets are freely available, but institutions retain IP eg: National soil map of Scotland : https://www.hutton.ac.uk/learning/natural-resource-datasets/soilshutton/soils-maps-scotland/download#soilmapdata
SOIL DATA SHARING POLICIES grids	Cannot be used to produce maps, or other land evaluations, without the approval of the soil data owner and/or without his participation to the mapping elaborations. The public access cannot be given because it adversely affects the intellectual property rights.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

5. Draft agreement for soil data sharing

Given that European Directives only apply to Member States.

Given that Turkey, Norway, Switzerland, and UK currently are not Member States.

Given that Switzerland and Norway have signed the 1998 Aarhus convention, and Norway has transposed into national legislation the linked EU Directives 2003/04/EC, and 2007/2/EC.

Given that UK was a Member State up to the 31/01/2020 and has transposed into national legislation the EU Directives 2003/04/EC, and 2007/2/EC, among the others linked to the topic of public access to environmental data.

Given that based on the article 4(2) of the Directives 2003/04/EC « Member States may provide for a request for environmental information to be refused if disclosure of the information would adversely affect:
(a) the confidentiality of the proceedings of public authorities, where such confidentiality is provided for by law;
(b) international relations, public security or national defence;
(c) the course of justice, the ability of any person to receive a fair trial or the ability of a public authority to conduct an enquiry of a criminal or disciplinary nature;
(d) the confidentiality of commercial or industrial information where such confidentiality is provided for by national or Community law to protect a legitimate economic interest, including the public interest in maintaining statistical confidentiality and tax secrecy;
(e) intellectual property rights;
(f) the confidentiality of personal data and/or files relating to a natural person where that person has not consented to the disclosure of the information to the public, where such confidentiality is provided for by national or Community law;
(g) the interests or protection of any person who supplied the information requested on a voluntary basis without being under, or capable of being put under, a legal obligation to do so, unless that person has consented to the release of the information concerned;
(h) the protection of the environment to which such information relates, such as the location of rare species.
The grounds for refusal mentioned in paragraphs 1 and 2 shall be interpreted in a restrictive way, taking into account for the particular case the public interest served by disclosure. In every particular case, the public interest served by disclosure shall be weighed against the interest served by the refusal. Member States may not, by virtue of paragraph 2(a), (d), (f), (g) and (h), provide for a request to be refused where the request relates to information on emissions into the environment.

Given that, following the Regulation (EU) 2016/679 on General Data Protection (GDPR), « 'personal data' means any information relating to an identified or identifiable natural person ('data subject');

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

and an identifiable natural person is one who can be identified, directly or indirectly, in particular by reference to an identifier such as a name, an identification number, location data, an online identifier or to one or more factors specific to the physical, physiological, genetic, mental, economic, cultural or social identity of that natural person. »

Given that the point georeferenced soil data are information related to an identifiable location, which land can be under private property.

Given that the georeferenced soil data are recognised as 'personal data under European Directive', in the transposition given by several EJP SOIL countries in their national legislations, and therefore georeferenced soil data need an authorization to be published online, which must be given by the respective landowners.

Given that the need for that authorization by landowners for the publication online of georeferenced soil data is explicitly declared in the agreements for soil sampling signed with landowners in several EJP SOIL countries.

Given that elaborated soil maps, in whichever format (vector or raster), can be subject to intellectual property rights, owned by the authors of those soil maps, and that those intellectual property rights are (or should be) declared in the metadata, in case the maps are published online.

Given that elaborated soil maps, in whichever format (vector or raster), are published by some institutions under specific licences, which are (or should be) declared in the metadata, in case the maps are published online.

Given that elaborated soil maps, in whichever format (vector or raster), are shared by some institutions under the recognition of an economic payment, and that the respective fees are (or should be) explicitly declared in the metadata repository.

Given that the EJP SOIL partners have agreed to follow the FAIR principles in the management of the data resulting from the research activities undertaken under the EJP SOIL programme, included the research activities undertaken under the internal projects of the EJP SOIL programme.

Given that the present is a draft general agreement, and that specific agreements for the sharing of specific soil datasets must be defined with the respective data owners.

Some general common rules for soil data sharing can be defined as follows:

7. The point georeferenced soil data eventually shared among EJP SOIL partners, and towards public institutions external to the EJP SOIL consortium, will not be shared online, if there is not the declared consent from the data owner, which may imply obligatorily for some countries/regions/data-owners of EJP SOIL consortium, to get the consent from landowners.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

8. The consent for the disclosure of point georeferenced soil data may not be needed only in case of data on emissions into the environment, which disclosure can be denied only if the disclosure adversely affects the international relations, the public security or national defence, the course of justice, the ability of any person to receive a fair trial or the ability of a public authority to conduct an enquiry of a criminal or disciplinary nature, and the intellectual property rights ;
9. The soil map data, in whichever format (vector or raster), eventually shared among the EJP SOIL partners, and towards public institutions external to the EJP SOIL consortium, can be published online given that in the metadata the sharing rules are recognised, such as intellectual property rights or specific licenses, as defined by the respective data owners ;
10. The soil map data, in whichever format (vector or raster), eventually shared among EJP SOIL partners, and towards public institutions external to the EJP SOIL consortium, which are shared by their owners under the recognition of an economic payment, could be published in metadata repositories explicitly declaring in the sharing rules the respective fees defined by the owners ;
11. A 'bottom-up' approach will be adopted in the soil mapping activities promoted by EJP SOIL involving the national/regional/federal-state soil data officers/services (official or not), similarly as it is adopted by the pillar 4 of the Global Soil Partnership ;
12. The signing of specific mutual agreements for soil data sharing between the EJP SOIL partners and external institution owner of soil data will be promoted inside each EJP SOIL country.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

6. Conclusions and way forward

An effective and systematic, European wide, soil data sharing can be reached only by overcoming several barriers. Thanks to the analysis performed in the present deliverable, we evidenced the lack of a specific national transpositional laws in relation to the sharing of soil information. Consequently, it was evidenced the lack of officially appointed soil officers and, therefore, the lack of networking between the soil data owners/holders and the public institutions officially appointed for the INSPIRE implementation, and the lack of defined rules for soil data sharing needed to settle the conflict between public and private rights. Based on the consuetudinary rules adopted in the EJP SOIL countries, so as described by the respondent to the "soil data ownership and sharing questionnaire" developed and distribute by the WP6 of the EJP SOIL programme, we could define a draft general agreement for soil data sharing, which is not intended to substitute the rules followed by the single soil data owning/holding institution. Nevertheless, we hope that those defined rules could become a use case, a procedural antecedent, in the long-term a vision to establish a permanent collaboration in Europe, between public institutions (inside and between European countries), finalized to the delivering of standard, harmonised and authoritative soil mapping and monitoring services, in support of an evidence-based, European wide, environmental-soil policy making, as it was in the intention of the European legislators.

Knowledge gaps on the technical aspects of INSPIRE implementation in general, and specifically in relation to soil were also evidenced, and the lack of enough financing needed to maintain the facilities for the online sharing of environmental data. We evidenced how the soil officers had to be found among "soil experts" and that a "bottom-up" approach in a European-wide soil mapping and monitoring services had to be followed.

The WP6 of the EJP SOIL is going to disseminate these findings, and promote the networking, through the organisation of national (web)seminars, as well as an extensive capacity building. These activities will be performed in collaboration with the WP5, WP8, and WP9 of the EJP SOIL.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

List of references

Cetl, V., de Lima, V.N., Tomas, R., Lutz, M., D'Eugenio, J., Nagy, A., Robbrecht, J., 2017. Summary Report on Status of implementation of the INSPIRE Directive in EU, EUR 28930 EN, Publications Office of the European Union, Luxembourg, 2017, ISBN 978-92-79-77058-6, JRC109035. https://doi.org/10.2760/143502

Cetl, V., Tomas, R., Kotsev, A., de Lima, V.N., Smith, R.S., Jobst, M., 2019. Establishing Common Ground Through INSPIRE: The Legally-Driven European Spatial Data Infrastructure. In: Döllner, J., Jobst, M., Schmitz, P. (eds) Service-Oriented Mapping. Lecture Notes in Geoinformation and Cartography. Springer, Cham. https://doi.org/10.1007/978-3-319-72434-8_3

Cho, G., Crompvoets, J., 2019. The INSPIRE directive: some observations on the legal framework and implementation, Survey Review, 51:367, 310-317, https://doi.org/10.1080/00396265.2018.1454686

D2.8.III.3 Data Specification on Soil – Technical Guidelines, https://inspire.ec.europa.eu/id/document/tg/so

Szpor, G., 2017. The Dilemmas of implementing the Inspire Directive. In: Conference Proceedings: Geographic Information Systems Conference and Exhibition (GIS ODYSSEY), Trento, 4 September 2017, (online)http://www.gis.us.edu.pl/index.php?option=com_mtree&task=att_download&link_id=766&cf_id=24

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

Annex 1 The EJP SOIL – WP6 (task 6.1) Questionnaire on soil data ownership and sharing

Authors: Fantappiè Maria, Peruginelli Ginevra, Conti Sara, Le Bas Christine, Rennes Stephanie, Fenny van Egmond.

As one of the first activities of task 6.1 of EJP SOIL we have elaborated this questionnaire, with the aim to better focus the supranational legal framework which should cover the soil data sharing and soil data ownership within the project. We kindly ask for your contribution in completing the questionnaire.

As you will notice the questionnaire includes multiple choice questions and free text questions. The latter are especially important and useful to us, to collect country-specific information that will help us in the analysis.

The responses gathered from the survey will be analyzed as a basis to elaborate a document on the policies for soil data sharing, among EJP-SOIL partners, towards ESDAC, and towards the general public (deliverable D6.2). All data collected from the responses will be solely used for the scientific/technical analysis of the survey. We would be very grateful if you could circulate the questionnaire among your members and/or affiliates, possibly targeting the organizations and/or individuals that, based on your knowledge, are more likely to be familiar with the subject of the survey and are willing to provide their useful insights. We also ask you to please send the questionnaire for compilation to all the main soil data owners of your respective countries.

TO BE NOTICED: Soil data are a major environmental information subject to the Directive (2003/4/EC) on public access to environmental Information, available in all MS languages at the link https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32003L0004 (section A of the questionnaire). Soil is the third spatial data theme reported in the Annex III of the INSPIRE Directive (2007/2/EC), available in all MS languages at the link https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX%3A32007L0002 (section B of the questionnaire). Although the questionnaire is based on the European legislation, it is thought to be compiled also by no Member State.

Here we have extracted some useful definitions (stated in Art. 3 of the INSPIRE directive 2007/2/EC), which may be needed for the compilation of the questionnaire:

“For the purposes of this Directive, the following definitions shall apply:
1. ‘infrastructure for spatial information’ means metadata, spatial data sets and spatial data services; network services and technologies; agreements on sharing, access and use; and coordination and monitoring mechanisms, processes and procedures, established, operated or made available in accordance with this Directive;

This project has received funding from the European Union’s Horizon 2020 research and innovation programme under grant agreement N° 862695

2. ‘spatial data’ means any data with a direct or indirect reference to a specific location or geographical area;
3. ‘spatial data set’ means an identifiable collection of spatial data;
4. ‘spatial data services’ means the operations which may be performed, by invoking a computer application, on the spatial data contained in spatial data sets or on the related metadata;
5. ‘spatial object’ means an abstract representation of a real world phenomenon related to a specific location or geographical area;
6. ‘metadata’ means information describing spatial data sets and spatial data services and making it possible to discover, inventory and use them;
7. ‘interoperability’ means the possibility for spatial data sets to be combined, and for services to interact, without repetitive manual intervention, in such a way that the result is coherent and the added value of the data sets and services is enhanced;
8. ‘Inspire geo-portal’ means an Internet site, or equivalent, providing access to the services referred to in Article 11(1);
9. ‘public authority’ means:
(a) any government or other public administration, including public advisory bodies, at national, regional or local level;
(b) any natural or legal person performing public administrative functions under national law, including specific duties, activities or services in relation to the environment; and
(c) any natural or legal person having public responsibilities or functions, or providing public services relating to the environment under the control of a body or person falling within (a) or (b);
Member States may provide that when bodies or institutions are acting in a judicial or legislative capacity, they are not to be regarded as a public authority for the purposes of this Directive;
10. ‘third party’ means any natural or legal person other than a public authority.”

The survey is available online at the following link:
https://forms.gle/6G2nw2ww88aH1UPd8

Should you require more details regarding the survey, you may contact us at: maria.fantappie@crea.gov.it

Thank you very much for your support!

This project has received funding from the European Union’s Horizon 2020 research and innovation programme under grant agreement N° 862695

GENERAL INFORMATION

Is your organization a (multiple choice allowed):
[] Public authority
[] Agency
[] University
[] Research Center
[] Other:
Please specify _____

Is your organization:
[] Public
[] Non-profit
[] Business/Private
[] Other:

Country where your organization is located
_____

Name of your organization (optional)
_____

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

A) SOIL DATA OWNERSHIP

1) Has your State transposed the Directive (2003/4/EC) on public access to environmental information into national law?

[ ] Yes

Please list the specific references separated by semicolon (number and date of publication)

[ ] No

2) Has your State transposed the Directive (2003/4/EC) specifically in relation to soil information?

[ ] Yes

Please list the specific references separated by semicolon (number and date of publication)

[ ] No

3) Is an official English version of the national legislation transposing the Directive (2003/4/EC) available?

[ ] Yes

Please indicate the link of English version.

[ ] No

4) Which laws, regulations and administrative provisions have been brought into force by your State to comply with the Directive (2003/4/EC), as foreseen in the article 12?

Please list the specific references separated by semicolon (number and date of publication)

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

5) On the base of the article 3 of the 2003/4/EC, has your State appointed "soil information officers"?

[ ] Yes

Please list the officially appointed "soil information officers" separated by semicolon (individuals and/or institutions)

[ ] No
[ ] No, but “soil information officers” not officially appointed exist
Please list, if existing, the not officially appointed "soil information officers" separated by semicolon (individuals and/or institutions)

6) On the base of the article 3 of the 2003/4/EC, has your State established and maintained facilities for the examination of the soil information?

[ ] Yes

Please indicate a reference to the facilities established and maintained for the examination of the soil information.
[ ] No

7) On the base of the article 3 of the 2003/4/EC, has your State published registers or lists of the environmental information (including soil information) held by public authorities or information points, with clear indications of where such information can be found?

[ ] Yes

Please indicate a reference to the published registers or lists.
[ ] No

8) If a national soil information service (official or not) exists, to which mapping requests does it answer (multiple choice)?

[ ] national scale mapping (1:500.000 to 1:250.000);
[ ] collaboration to the international scale mapping (> 1:500.00 scale);
[ ] (collaboration to) regional scale mapping (1:50.000 to 1:250.000);
[ ] the mapping service is not given.

This project has received funding from the European Union’s Horizon 2020 research and innovation programme under grant agreement N° 862695

9) Did your State/Region appointed regional/federal-state "soil information officers"?

[ ] Yes
Please list the officially appointed regional/federal-state "soil information officers" separated by semicolon (individuals and/or institutions)
[ ] No
[ ] No, but regional/federal-state “soil information officers” not officially appointed exist
Please list, if existing, the not officially appointed regional/federal-state "soil information officers" separated by semicolon (individuals and/or institutions)

10) If regional/federal-states soil information service (official or not) exist, to which mapping requests do they answer (more than one answer possible)?

[ ] collaboration to national scale mapping (1:500.000 to 1:250.000);
[ ] collaboration to the international scale mapping (> 1:500.00 scale);
[ ] regional scale mapping (1:50.000 to 1:250.000)
[ ] the mapping service is not given.

11) Which soil information service(s) is(are) supplying the mapping services needed to answer to the request for soil indicators mapping coming from the European Commission?

[ ] National centralized soil service;
[ ] Regional/federal-states soil services;
[ ] A collaboration between the national and the regional/federal-states soil services;
[ ] None, service not supplied by our country
[ ] Other (please specify)

12) Which soil information service(s) is(are) supplying the soil monitoring service?

[ ] National centralized soil service;
[ ] Regional/federal-states soil services;
[ ] A collaboration between the national and the regional/federal-states soil services;
[ ] None, service not supplied by our country
[ ] Other (please specify)

13) Is your State collaborating to the soil mapping activity of FAO-GSP?

[ ] Yes
[ ] No

This project has received funding from the European Union’s Horizon 2020 research and innovation programme under grant agreement N° 862695

14) Which soil information service(s) is(are) collaborating to the soil mapping activity of FAO-GSP?

[ ] National centralized soil service;
[ ] Regional/federal-states soil services;
[ ] A collaboration between the national and the regional/federal-states soil services;
[ ] None, service not supplied by our country
[ ] Other (please specify)

15) Besides the laws, regulations and administrative provisions brought into force by your State to comply with the Directives 2003/4/EC and 2007/2/EC, which other laws exist in your State as a legal framework for soil data sharing?

Please list the legal references separated by semicolon and useful observations for a better knowledge of national overview on the topic.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

B) INSPIRE INFRASTRUCTURE FOR SOIL DATA

16) Has your State transposed the INSPIRE Directive (2007/2/EC) in relation to soil data, into national law?

[ ] Yes

Please list the specific references separated by semicolon (number and date of publication)

[ ] No

17) Is an official English version of the national legislation transposing the INSPIRE Directive (2007/2/EC) law available?

[ ] Yes

Please indicate the link of English version.

[ ] No

18) Which laws, regulations and administrative provisions have been brought into force by your country/region to comply with the INSPIRE Directive (2007/2/EC), as foreseen in the article 24?

Please list the specific references separated by semicolon (number and date of publication)

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

C) METADATA ON SOIL INFORMATION

19) Is your national soil information service (official or not) publishing the metadata of the spatial data sets and services for which is responsible?

[ ] Yes

Please put a reference

[ ] No

20) Are the regional/federal-state soil information services (official or not) publishing the metadata of the spatial data sets and services for which they are responsible?

[ ] Yes

Please put a reference

[ ] No

21) Do the "soil" metadata include information on the conditions that apply to access to, and use of, spatial data sets and services and, where applicable, corresponding fees?

[ ] Yes

[ ] No

[ ] Metadata are not given

[ ] Other (please specify)

22) Do the "soils" metadata include information on the public authorities responsible for the establishment, management, maintenance and distribution of these spatial data sets and services?

[ ] Yes

[ ] No

[ ] Metadata are not given

[ ] Other (please specify)

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

23) Do the “soils” metadata include information on possible limitations on public access?

[ ] Yes

[ ] No

[ ] Metadata are not given

[ ] Other (please specify)

This project has received funding from the European Union’s Horizon 2020 research and innovation programme under grant agreement N° 862695

D) INTEROPERABILITY OF SPATIAL DATA SETS AND SERVICES

24) Has your State (EU or no EU) implemented specific legal provisions for the implementing rules laying down technical arrangements for the interoperability and harmonisation of spatial data sets and services (reference to the art 7. Directive 2007/2/EC)?

[ ] Yes

Please list the specific references separated by semicolon (number and date of publication)

[ ] No

25) Has your State (EU or no EU) implemented additional or other regulations for interoperability and harmonization (this can be for instance to adhere to FAIR)?

[ ] Yes

Please list the specific references separated by semicolon (number and date of publication)

[ ] No

26) Has your State adopted relevant standards to ensure interoperability or harmonisation of spatial data sets (reference to the art 7. Directive 2007/2/EC)?

[ ] Yes

Please list the adopted standards separated by semicolon

[ ] No

27) Has your State adopted relevant standards to ensure interoperability or harmonisation of spatial data sets specifically to the soil theme (reference to the art 7. Directive 2007/2/EC)?

[ ] Yes

Please list the adopted standards separated by semicolon

[ ] No

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

28) Do the implementing rules for the interoperability and harmonisation of soil spatial data sets and services adopted by your State cover the definition and classification of the soil spatial objects (reference to the art 7. Directive 2007/2/EC)?

[ ]Yes

[ ] No

[ ] Other (please answer other if no implemented rules have been adopted)

29) Do the implementing rules for the interoperability and harmonisation of spatial data sets and services adopted by your State cover the way in which those spatial data are geo-referenced (reference to the art 7. Directive 2007/2/EC)?

[ ]Yes

[ ] No

[ ] Other (please answer other if no implemented rules have been adopted)

30) Do the implementing rules for the interoperability and harmonisation of spatial data sets and services adopted by your State include a common framework for the unique identification of soil spatial objects, to which identifiers under national systems can be mapped in order to ensure interoperability between them (reference to the art 8. Directive 2007/2/EC)?

[ ]Yes

[ ] No

[ ] Other (please answer other if no implemented rules have been adopted)

31) Do the implementing rules for the interoperability and harmonisation of spatial data sets and services adopted by your State include the relationship between data objects (reference to the art 8. Directive 2007/2/EC)?

[ ]Yes

[ ] No

[ ] Other (please answer other if no implemented rules have been adopted)

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

32) Do the implementing rules for the interoperability and harmonisation of spatial data sets and services adopted by your State include the key attributes and the corresponding multilingual thesauri commonly required for policies which may have an impact on environment (reference to the art 8. Directive 2007/2/EC)?

[ ]Yes

[ ] No

[ ] Other (please answer other if no implemented rules have been adopted)

33) Do the implementing rules for the interoperability and harmonisation of spatial data sets and services adopted by your State include information on the temporal dimension of the data (reference to the art 8. Directive 2007/2/EC)?

[ ]Yes

[ ] No

[ ] Other (please answer other if no implemented rules have been adopted)

34) Do the implementing rules for the interoperability and harmonisation of spatial data sets and services adopted by your State include updates of the data (reference to the art 8. Directive 2007/2/EC)?

[ ]Yes

[ ] No

[ ] Other (please answer other if no implemented rules have been adopted)

35) Are the implementing rules adopted by your State designed to ensure consistency between items of information which refer to the same location or between items of information which refer to the same object represented at different scales (reference to the art 8. Directive 2007/2/EC)?

[ ]Yes

[ ] No (please specify)

[ ] Other (please answer other if no implemented rules have been adopted)

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

36) Are the implementing rules designed to ensure that information derived from different spatial data sets is comparable as regards the definition and classification of the spatial objects and the way in which those spatial data are geo-referenced (reference to the art 8. Directive 2007/2/EC)?

[ ]Yes

[ ] No (please specify)

[ ] Other (please answer other if no implemented rules have been adopted)

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

E) NETWORK SERVICES

37) Did your State/Region establish and operate a network of services for the spatial data sets and services for which metadata have been created (reference to the art 11. Directive 2007/2/EC)?

[ ]Yes

[ ] No

38) If yes to the previous question, which one of the following services are given? (more than one choice is possible)

[ ] discovery services making it possible to search for spatial data sets and services on the basis of the content of the corresponding metadata and to display the content of the metadata;

[ ] view services making it possible, as a minimum, to display, navigate, zoom in/out, pan, or overlay viewable spatial data sets and to display legend information and any relevant content of metadata;

[ ] download services, enabling copies of spatial data sets, or parts of such sets, to be downloaded and, where practicable, accessed directly;

[ ] transformation services, enabling spatial data sets to be transformed with a view to achieving interoperability;

[ ] services allowing spatial data services to be invoked;

[ ] other, please specify.

39) If yes to the question 37, are those services free of charge (reference to the art 14. Directive 2007/2/EC)?

[ ] Yes

[ ] No

40) If yes to the question 37, are those services covered by license of use (reference to the art 14. Directive 2007/2/EC)?

[ ]Yes

Please specify which license

[ ] No

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

41) Which are the search criteria implemented in the network of services (more than one choice is possible)?

[ ] keywords
[ ] classification of spatial data and services
[ ] the quality and validity of spatial data set
[ ] degree of conformity with the implementing rules
[ ] geographical location
[ ] conditions applying to the access to and use of spatial data sets and services
[ ] the public authorities responsible for the establishment, management, maintenance and distribution of spatial data sets and services
[ ] other (please specify)

42) Are the public authorities in your State/Region given the technical possibility to link their spatial data sets and services to the network of services?

[ ]Yes

[ ] No

43) Is there the possibility, in your State/Region, to link the network of services upon request to third parties whose spatial data sets and services comply with the implementing rules for metadata and interoperability (reference to the art 11. Directive 2007/2/EC)?

[ ]Yes

Please specify which third parties refer to

[ ] No

44) Are the services of the question 37 made available through the INSPIRE geo-portal (https://inspire-geoportal.ec.europa.eu/) or through a national/regional portal, or through both (reference to the art 15. Directive 2007/2/EC) (multiple choice)?

[ ] the INSPIRE geo-portal

[ ] a national/regional portal (please give the link)

[ ] both

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

F) SOIL DATA-SHARING

45) Are there conditions and limitations to access the soil point observations with coordinates owned by your institution (we do not refer here to soil data that your institution has received from other soil data owners, under mutual agreement)?

[ ]Yes

[ ] No

46) If you answered yes in the previous question, which one of the following conditions and limitations apply to the soil point observations with coordinates (more than one answer possible) (reference to the art 13. Directive 2007/2/EC)?

[ ] the data cannot be published online

[ ] the data cannot be used to produce maps, or other land evaluations, without your approval and/or without your participation to the mapping elaborations

[ ] the data can be published online and used to produce maps, or other land evaluations, given that the data owner has been cited and keep informed

[ ] the data can be published online and used to produce maps, or other land evaluations, but some sensitive data must be hidden (please specify which ones)

[ ] the data can be published online, but under a specific license (e.g. Creative Commons, or others), please specify

[ ] the public access cannot be given because it adversely affects the confidentiality of the proceedings of public authorities

[ ] the public access cannot be given because it adversely affects the international relations, public security or national defense

[ ] the public access cannot be given because it adversely affects the course of justice, the ability of any person to receive a fair trial or the ability of a public authority to conduct an enquiry of a criminal or disciplinary reason

[ ] the public access cannot be given because it adversely affects the confidentiality of commercial or industrial information, where such confidentiality is provided for by national or Community law to protect a legitimate economic interest, including the public interest in maintaining statistical confidentiality and tax secrecy

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

[ ] the public access cannot be given because it adversely affects the intellectual property rights

[ ] the public access cannot be given because it adversely affects the confidentiality of personal data and/or files relating to a natural person where that person has not consented to the disclosure of the information to the public, where such confidentiality is provided by national or Community law

[ ] the public access cannot be given because it adversely affects the interest or protection of any person who supplied the information requested on a voluntary basis without being under, or capable of being put under, a legal obligation to do so, unless that person has consented to the release of the information concerned

[ ] the public access cannot be given because it adversely affects the protection of the environment to which such information relates, such as the location of rare species

[ ] other conditions and limitations apply, or more specification are needed (please specify)

Specify here

47) Which are the possible incentives for sharing the soil point observations with coordinates owned by your institution (more than one answer possible)?

[ ] an economic payment is given to soil data owners

[ ] signed mutual agreements inside projects

[ ] the establishment of a permanent collaboration formally recognized

[ ] other (please specify and eventually comment the answers given)

Specify and comment here

48) Are there conditions and limitation to access to the soil polygon maps owned by your institution (we do not refer here to soil data that your institution has received by other soil data owners, under mutual agreement)?

[ ]Yes

[ ] No

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

49) If you answered yes in the previous question, which one of the following conditions and limitations apply to the soil polygon maps owned by your institution (more than one answer possible)?

[ ] the data cannot be published online

[ ] the data cannot be used to produce maps, or other land evaluations, without your approval and/or without your participation to the mapping elaborations

[ ] the data can be published online and used to produce maps, or other land evaluations, given that the data owner has been cited and keep informed

[ ] the data can be published online and used to produce maps, or other land evaluations, but some sensitive data must be hidden (please specify which ones)

[ ] the data can be published online, but under a specific license (e.g. Creative Commons, or others), please specify

[ ] the public access cannot be given because it adversely affects the confidentiality of the proceedings of public authorities

[ ] the public access cannot be given because it adversely affects the international relations, public security or national defense

[ ] the public access cannot be given because it adversely affects the course of justice, the ability of any person to receive a fair trial or the ability of a public authority to conduct an enquiry of a criminal or disciplinary reason

[ ] the public access cannot be given because it adversely affects the confidentiality of commercial or industrial information, where such confidentiality is provided for by national or Community law to protect a legitimate economic interest, including the public interest in maintaining statistical confidentiality and tax secrecy

[ ] the public access cannot be given because it adversely affects the intellectual property rights

[ ] the public access cannot be given because it adversely affects the confidentiality of personal data and/or files relating to a natural person where that person has not consented to the disclosure of the information to the public, where such confidentiality is provided by national or Community law

[ ] the public access cannot be given because it adversely affects the interest or protection of any person who supplied the information requested on a voluntary basis without being under, or capable

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

of being put under, a legal obligation to do so, unless that person has consented to the release of the information concerned

[ ] the public access cannot be given because it adversely affects the protection of the environment to which such information relates, such as the location of rare species

[ ] other conditions and limitations apply, or more specification are needed (please specify)

Specify here

50) Which are the possible incentives for sharing the soil polygon maps owned by your institution (more than one answer possible)?

[ ] an economic payment is given to soil data owners

[ ] signed mutual agreements inside projects

[ ] the establishment of a permanent collaboration formally recognized

[ ] other (please specify and eventually comment the answers given)

Specify and comment here

51) Are there conditions and limitations to access to the soil grids owned by your institution (we do not refer here to soil data that your institution has received by other soil data owners, under mutual agreement)?

[ ]Yes

[ ] No

52) If you answered yes in the previous question, which one of the following conditions and limitations apply to the soil grids owned by your institution (more than one answer possible)?

[ ] the data cannot be published online

[ ] the data cannot be used to produce maps, or other land evaluations, without your approval and/or without your participation to the mapping elaborations

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

[ ] the data can be published online and used to produce maps, or other land evaluations, given that the data owner has been cited and keep informed

[ ] the data can be published online and used to produce maps, or other land evaluations, but some sensitive data must be hidden (please specify which ones)

[ ] the data can be published online, but under a specific license (e.g. Creative Commons, or others), please specify

[ ] the public access cannot be given because it adversely affects the confidentiality of the proceedings of public authorities

[ ] the public access cannot be given because it adversely affects the international relations, public security or national defense

[ ] the public access cannot be given because it adversely affects the course of justice, the ability of any person to receive a fair trial or the ability of a public authority to conduct an enquiry of a criminal or disciplinary reason

[ ] the public access cannot be given because it adversely affects the confidentiality of commercial or industrial information, where such confidentiality is provided for by national or Community law to protect a legitimate economic interest, including the public interest in maintaining statistical confidentiality and tax secrecy

[ ] the public access cannot be given because it adversely affects the intellectual property rights

[ ] the public access cannot be given because it adversely affects the confidentiality of personal data and/or files relating to a natural person where that person has not consented to the disclosure of the information to the public, where such confidentiality is provided by national or Community law

[ ] the public access cannot be given because it adversely affects the interest or protection of any person who supplied the information requested on a voluntary basis without being under, or capable of being put under, a legal obligation to do so, unless that person has consented to the release of the information concerned

[ ] the public access cannot be given because it adversely affects the protection of the environment to which such information relates, such as the location of rare species

[ ] other conditions and limitations apply, or more specification are needed (please specify)

Specify here

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

53) Which are the possible incentives for sharing the soil grids owned by your institution (more than one answer possible)?

[ ] an economic payment is given to soil data owners

[ ] signed mutual agreements inside projects

[ ] the establishment of a permanent collaboration formally recognized

[ ] other (please specify and eventually comment the answers given)

Specify and comment here

54) Which kind of legal authorization is needed for soil sampling in your country, region and/or federal state?

Free text

55) Which kind of agreements do you make with landowners about publishing and sharing the results of the sampling campaign that took place on their land?

Free text

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

ANNEX I, II, and III of the DIRECTIVE 2007/2/EC on the establishing of an Infrastructure for Spatial Information in the European Community (INSPIRE)

ANNEX I

SPATIAL DATA THEMES REFERRED TO IN ARTICLES 6(A), 8(1) AND 9(A)

1. Coordinate reference systems

Systems for uniquely referencing spatial information in space as a set of coordinates (x, y, z) and/or latitude and longitude and height, based on a geodetic horizontal and vertical datum.

2. Geographical grid systems

Harmonised multi-resolution grid with a common point of origin and standardised location and size of grid cells.

3. Geographical names

Names of areas, regions, localities, cities, suburbs, towns or settlements, or any geographical or topographical feature of public or historical interest.

4. Administrative units

Units of administration, dividing areas where Member States have and/or exercise jurisdictional rights, for local, regional and national governance, separated by administrative boundaries.

5. Addresses

Location of properties based on address identifiers, usually by road name, house number, postal code.

6. Cadastral parcels

Areas defined by cadastral registers or equivalent.

7. Transport networks

Road, rail, air and water transport networks and related infrastructure. Includes links between different networks. Also includes the trans-European transport network as defined in Decision No 1692/96/EC of the European Parliament and of the Council of 23 July 1996 on Community Guidelines for the development of the trans-European transport network (1) and future revisions of that Decision.

8. Hydrography

Hydrographic elements, including marine areas and all other water bodies and items related to them, including river basins and sub-basins. Where appropriate, according to the definitions set out in Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy (2) and in the form of networks.

9. Protected sites

Area designated or managed within a framework of international, Community and Member States' legislation to achieve specific conservation objectives.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

ANNEX II

SPATIAL DATA THEMES REFERRED TO IN ARTICLES 6(A), 8(1) AND 9(B)

1. Elevation

Digital elevation models for land, ice and ocean surface. Includes terrestrial elevation, bathymetry and shoreline.

2. Land cover

Physical and biological cover of the earth's surface including artificial surfaces, agricultural areas, forests, (semi-) natural areas, wetlands, water bodies.

3. Orthoimagery

Geo-referenced image data of the Earth's surface, from either satellite or airborne sensors.

4. Geology

Geology characterised according to composition and structure. Includes bedrock, aquifers and geomorphology.

ANNEX III

SPATIAL DATA THEMES REFERRED TO IN ARTICLES 6(B) AND 9(B)

1. Statistical units

Units for dissemination or use of statistical information.

2. Buildings

Geographical location of buildings.

3. Soil

Soils and subsoil characterised according to depth, texture, structure and content of particles and organic material, stoniness, erosion, where appropriate mean slope and anticipated water storage capacity.

4. Land use

Territory characterised according to its current and future planned functional dimension or socio-economic purpose (e.g. residential, industrial, commercial, agricultural, forestry, recreational).

5. Human health and safety

Geographical distribution of dominance of pathologies (allergies, cancers, respiratory diseases, etc.), information indicating the effect on health (biomarkers, decline of fertility, epidemics) or well-being of humans (fatigue, stress, etc.) linked directly (air pollution, chemicals, depletion of the ozone layer, noise, etc.) or indirectly (food, genetically modified organisms, etc.) to the quality of the environment.

6. Utility and governmental services

Includes utility facilities such as sewage, waste management, energy supply and water supply, administrative and social governmental services such as public administrations, civil protection sites, schools and hospitals.

7. Environmental monitoring facilities

Location and operation of environmental monitoring facilities includes observation and measurement of emissions, of the state of environmental media and of other ecosystem parameters (biodiversity, ecological conditions of vegetation, etc.) by or on behalf of public authorities.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

8. Production and industrial facilities
Industrial production sites, including installations covered by Council Directive 96/61/EC of 24 September 1996 concerning integrated pollution prevention and control (1) and water abstraction facilities, mining, storage sites.

9. Agricultural and aquaculture facilities
Farming equipment and production facilities (including irrigation systems, greenhouses and stables).

10. Population distribution — demography
Geographical distribution of people, including population characteristics and activity levels, aggregated by grid, region, administrative unit or other analytical unit.

11. Area management/restriction/regulation zones and reporting units
Areas managed, regulated or used for reporting at international, European, national, regional and local levels. Includes dumping sites, restricted areas around drinking water sources, nitrate-vulnerable zones, regulated fairways at sea or large inland waters, areas for the dumping of waste, noise restriction zones, prospecting and mining permit areas, river basin districts, relevant reporting units and coastal zone management areas.

12. Natural risk zones
Vulnerable areas characterised according to natural hazards (all atmospheric, hydrologic, seismic, volcanic and wildfire phenomena that, because of their location, severity, and frequency, have the potential to seriously affect society), e.g. floods, landslides and subsidence, avalanches, forest fires, earthquakes, volcanic eruptions.

13. Atmospheric conditions
Physical conditions in the atmosphere. Includes spatial data based on measurements, on models or on a combination thereof and includes measurement locations.

14. Meteorological geographical features
Weather conditions and their measurements; precipitation, temperature, evapotranspiration, wind speed and direction.

15. Oceanographic geographical features
Physical conditions of oceans (currents, salinity, wave heights, etc.).

16. Sea regions
Physical conditions of seas and saline water bodies divided into regions and sub-regions with common characteristics.

17. Bio-geographical regions
Areas of relatively homogeneous ecological conditions with common characteristics.

18. Habitats and biotopes
Geographical areas characterised by specific ecological conditions, processes, structure, and (life support) functions that physically support the organisms that live there. Includes terrestrial and aquatic areas distinguished by geographical, abiotic and biotic features, whether entirely natural or semi-natural.

19. Species distribution

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695

Geographical distribution of occurrence of animal and plant species aggregated by grid, region, administrative unit or other analytical unit.

20. Energy resources
Energy resources including hydrocarbons, hydropower, bio-energy, solar, wind, etc., where relevant including depth/height information on the extent of the resource.

21. Mineral resources
Mineral resources including metal ores, industrial minerals, etc., where relevant including depth/height information on the extent of the resource.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 862695