3436/R0-Copernicus/EEA/IDM/R0/19/013

SC57755

Implementation of CLC+ based on the EAGLE concept –

additional support for further development of CLC+ databases (CLC+ and CLC+ instances, namely CLC+ LULUCF instance and CLC+ Legacy instance)

Task 2:

Analysis of the MS replies to the EEA request for inventorying existing LU information in the countries

D2 - Report containing an assessment of the LU inventory by MS, including an assessment on the impact of existing / missing LU parameters for the creation of CLC+ LULUCF and Legacy instances

Version 2.0

11.02.2020

Version history

Version	Date	Author	Status and description	Distribution
0.1	24-01-2020	Gerard Hazeu and Marian Vittek	First draft	EAGLE group
0.2	28-01-2020	Michael Bock, Stefan Kleeschulte, Barbara Kosztra, Hugo Costa, Mario Caetano, Felipe Marcelino, Geoff Smith	Review of first draft	EAGLE group
0.3	05-02-2020	Gerard Hazeu and Marian Vittek	2nd draft	EAGLE group
0.4	10-02-2020	Stefan Kleeschulte, Barbara Kosztra, Marian Vittek	Review of second draft	EAGLE group
2.0	11-02-2020	Gerard Hazeu, Marian Vittek	Version 2	EEA and EAGLE group

Table of Contents

1 Background 5
1.1 Aim of task 5
1.2 Overview of activities within service contract 5
1.3 Heritage 6
1.4 Data requested by EEA 6
1.5 Reader's help 7
2 General overview of MS inventories 8
2.1 General 8
2.2 EAGLE elements needed for creation of CLC+ Legacy and CLC+ LULUCF instances 10
2.3 Methodology 11
3 Analysis Land Use Attributes 13
3.1 Number of LUAs per MS (all, CLC+ Legacy, CLC+ LULUCF) 13
3.2 Number of Member States covering specific LUAs (CLC+ Legacy, CLC+ LULUCF) 15
3.3 Main gaps 17
4 Analysis Landscape Characteristics 19
4.1 Number of Landscape Characteristics per Member State (all, CLC+ Legacy, CLC+ LULUCF) 19
4.2 Number of Member States covering specific LCHs (CLC+ Legacy, CLC+ LULUCF) 21
4.3 Main gaps 23
5 Resource description 25
5.1 Number of datasets 25
5.2 Characteristics of MS datasets based on resource description 26
5.2.1 Temporal extent 26
5.2.2 Language 27
5.2.3 Coverage 28
5.2.4 Representation type 29
5.2.5 Minimum mapping unit 30
5.2.6 Minimum mapping unit (detailed) 30
5.2.7 Format 31
5.2.8 Update frequency 32
5.2.9 Spatial resolution 33
5.3 Access conditions 34
5.3.1 Access 34
5.3.2 Costs 35

5.3.3 Proliferation in CLC instances 36
5.3.4 CORDA 37
5.3.5 INSPIRE 38
6 Conclusions and recommendations 39
6.1 Assessment of the impact of LUA/LCH availability 39
6.1.1 CLC+ Legacy instance 39
6.1.2 CLC+ LULUCF instance 39
6.1.3 Overall impact of MS data availability regarding LUAs/LCHs for CLC+ instances 41
6.2 Other issues relevant for applicability of MS data for CLC+ instances 41
6.2.1 Characteristics of datasets 41
6.2.2 Access conditions 42
6.2.3 Summary per MS 43
6.3 Improvements and limitations of current MS inventory 46
6.4 Recommendations and possible future activities 47
6.4.1 Objections and recommendations 47
6.4.2 Possible future activities 50
7 Annexes 51
7.1 Presence Land Use Attributes per MS (level 1-4) 51
7.2 Presence Landscape Characteristics per MS (level 1-4) 55
7.3 Number of MS covering Land Use Attributes (CLC+ Legacy and CLC+ LULUCF) 62
7.4 Number of MS covering Landscape Characteristics (CLC+ Legacy and CLC+ LULUCF) 63
7.5 Overview of number of datasets per MS per database characteristic 64
7.5.1 Temporal extent 64
7.5.2 Language 65
7.5.3 Coverage 66
7.5.4 Representation type 67
7.5.5 Minimum mapping unit 68
7.5.6 Minimum mapping unit (detailed) 69
7.5.7 Format 70
7.5.8 Update frequency 71
7.5.9 Spatial resolution 72
7.6 Overview number of datasets per MS for different access conditions 73
7.6.1 Access 73
7.6.2 Costs 74
7.6.3 Proliferation in CLC instances 75

7.6.4 CORDA 76
7.6.5 INSPIRE 77

1 BACKGROUND

1.1 Aim of task

The task "Analysis of the Member States (MS) replies to the EEA request for inventorying existing LU information in the countries" is part of the Service Contract No 3436/R0-COPERNICUS/EEA.57755. This service contract is a continuation of the work done under the service contracts No 3436/R0-COPERNICUS/EEA.57292 and No 3436/R0-COPERNICUS/EEA.57664.

In the context of the Negotiated Procedure No EEA/IDM/R0/16/009 EEA has asked the Member States to provide feedback about existing land use information in the countries. Land use information is a crucial input for populating CLC+ Core and to derive CLC+ Instances, particularly LULUCF or Legacy. The original deadline for responses from the MS was November 30th 2019. Data available by January 24th, 2020 was taken into account in this report[1]. It must be noted that in the negotiated procedure LU data availability information was requested only for the CLC+ Legacy instance. The need for information regarding CLC+ LULUCF instance has been expressed after releasing the call and having most of the MS contracted, thus the survey could provide only limited information on LULUCF-related data availability.

The aim of this task is to collate and review the responses from the MS to the EEA request about existing sources for LU information under Negotiated Procedure No EEA/IDM/R0/16/009. The MS response are analysed with respect to the sufficiency, quality and accessibility of such data to derive the requested CLC+ Instances.

1.2 Overview of activities within service contract

Within the task, as described in the Terms of Reference, the following activities were undertaken:

- Review and summarise the information already provided in CORDA with respect to availability and access conditions of existing national Land Use and Characteristics data in the context of the requested CLC+ Instances;
- Review and summarise the MS information collected as part of the land use survey;
- Review and analyse the characteristics of datasets used by MS to deliver Land Use Attributes (LUA) and Landscape Characteristics (LCH) (temporal extent, update frequency, spatial detail (MMU or spatial resolution) etc.;
- Assess the impact and feasibility for the production of CLC+ LULUCF and CLC+ Legacy instances keeping in mind issues such as
    - the definition of LULUCF categories by the UNFCC Convention and the transposition into national applications,
    - the reduction of impact knowing that info gets stored in 1 ha grid cells,
    - homogeneity / harmonisation of LUA information across Europe
- Identification of main gaps and potential additional data sources.

[1] Updated inventories by MS and inventories of Ireland, Belgium and/or Malta eventually delivered after this date were not included in the assessment.

1.3 Heritage

In the service contract No 3436/R0-COPERNICUS/EEA.57664, task 2 "Semantic composition/ ontologies" a precursor activity has taken place in which six national LC/LU datasets have been checked, examining to what extent they are able to provide data to fill in the required information themes in CLC+ Core. The subtask did not aim to provide an in-depth analysis of data availability, but rather to highlight foreseeable semantic gaps and take steps towards developing a methodology of evaluation.

The results and conclusions of this activity were taken into account during this task. In the report reference is made to the analysis performed during this activity under chapter "Analysis of selected National Nomenclatures".

1.4 Data requested by EEA

In the context of the Negotiated Procedure No EEA/IDM/R0/16/009 EEA has asked the Member States to provide feedback about existing land use information in the MS. The request consisted of an inventory of land use attributes (LUA) and other landscape characteristics (LCH) available at MS level. The expected deliverables were an Excel table containing the results of this inventory and an accompanying technical report.

The inventory of LUA/LCHs took place according to a predefined list of LUA/LCHs as defined by the EAGLE group[2]. For each LUA/LCH the availability, the resource title and the relevant field or attribute were asked to provide. The LUA/LCHs were arranged in 4-5 hierarchical levels.

The inventory also took into account a description of the MS datasets from which the LUA/LCHs could be derived. The description of the datasets was according the following attributes resource title, resource abstract, temporal extent, update frequency, language, coverage, CRS, representation type, spatial resolution, minimum mapping unit (MMU), INSPIRE theme, access conditions, proliferation in CLC+ instances allowed, data costs, resource locator, resource provider, INSPIRE locator, CORDA locator and comments. The attributes representation type, INSPIRE theme, access conditions and proliferation in CLC+ instances allowed could be filled in according to a pre-defined look-up table.

EEA's request to the MS was voluntary and 12 MS decided not to participate in EEA's inventory. The inventories of Albania, Cyprus, Denmark, Estonia, Kosovo, Latvia, Luxembourg, Montenegro, Republic of North Macedonia, Serbia, Switzerland and Turkey were outsourced to a company called Bilbomatica.

In the original EEA's request to the MS the LUA/LCHs needed to derive CLC+ Legacy instance were mandatory (green marked LUA/LCHs in the MS request). Eventually MS could provide information about other LUA/LCHs on a voluntary basis. The need for additional information regarding CLC+ LULUCF instance has been expressed after the release. As not all MS delivered information for all LUA/LCHs this overall assessment of the MS inventories could only provide limited information on LULUCF-related data availability. Furthermore, not all LUA/LCHs as defined by the EAGLE group were visible in the Excel file as they were in intentionally hidden columns as they were not seen as important for the MS inventory.

[2] https://land.copernicus.eu/eagle/content-documentation-of-the-eagle-concept/manual/content-documentation-of-the-eagle-concept/b-thematic-content-and-definitions-of-eagle-model-elements

Next to the three categories of LUA/LCHs mentioned, i.e. mandatory for CLC+ Legacy, additional LUA/LCHs for CLC+ LULUCF instance and hidden LUAs/LCHs, there were also some extra LUA/LCHs coming from the previous service contract as important in the need to derive CLC+ Legacy instance. This was also expressed after the release of EEA's request. In Annex 7.3 and 7.4 an overview is presented with LUA/LCHs needed to derive the CLC+ instances and their history. The LUA/LCHs in red are the extra ones proposed by the service contract No 3436/R0-COPERNICUS/EEA.57664, task 2 "Semantic composition / ontologies". The LUA/LCHs in blue are the ones needed to derive CLC+ instances **and** that were hidden in the Excel file sent out to the MS.

1.5 Reader's help

In chapter 1 the background and history of the current assessment are presented. The aim of the task, the background or heritage of the assessment with an overview of the activities as described in the project proposal and in detail the request of EEA to the MS. The outcome of this MS inventories is the basis for this assessment.

Next to a short description of the methodology also a general overview is presented in chapter 2.

Chapter 3 presents the assessment of the LUAs for the CLC+ instances. Main point of entrance are the reporting of the MS on the availability of national data regarding the LUAs. The assessment was split into an assessment on the number of LUAs per MS, an assessment on the number of MS per LUA and an assessment of the main gaps.

In chapter 4 the assessment of the LCHs for the CLC+ instances is assessed. Main point of entrance are the reporting of the MS on the availability of national data regarding the LCHs. The assessment was split into an assessment on the number of LCHs per MS, an assessment on the number of MS per LCHs and an assessment of the main gaps.

The assessment of the resource descriptions, i.e. the characteristics describing the datasets, are evaluated in European context and per MS in chapter 5. The number of datasets per MS, different characteristics of those datasets and the access conditions were discussed.

Chapter 6 is dealing with the conclusions and recommendations. An assessment of the impact of the availability of LUA/LCHs in the MS, other issues relevant for the applicability of MS data for CLC+ instances like the access conditions and other data characteristics. Also a summary per MS on the characteristics and access conditions of the MS datasets is presented.

In chapter 7 you could find all the Annexes with overviews on the presences of LUA/LCHs per MS, number of MS covering LUA/LCHs needed for CLC+ instances and overviews of the original data regarding the different characteristics of the MS data.

For getting an overview or summary of the activities undertaken in the assessment, the conclusions and recommendations it is worthwhile to focus on the sections 1.4, 2.1, 3.3, 4.3 and chapter 6.

2 GENERAL OVERVIEW OF MS INVENTORIES

2.1 General

In total 36 inventories[3] were collected and taken into account for the review and analysis discussed in this report. From 12 out of the 36 Member States data was collected, stored in an Access database and provided by the company Bilbomatica as they decided not to participate in the inventory by themselves. The 12MS were Albania, Cyprus, Denmark, Estonia, Kosovo, Latvia, Luxembourg, Montenegro, Republic of North Macedonia, Serbia, Switzerland and Turkey. For the other 24 MS the inventory of land use data was done by the MS themselves.

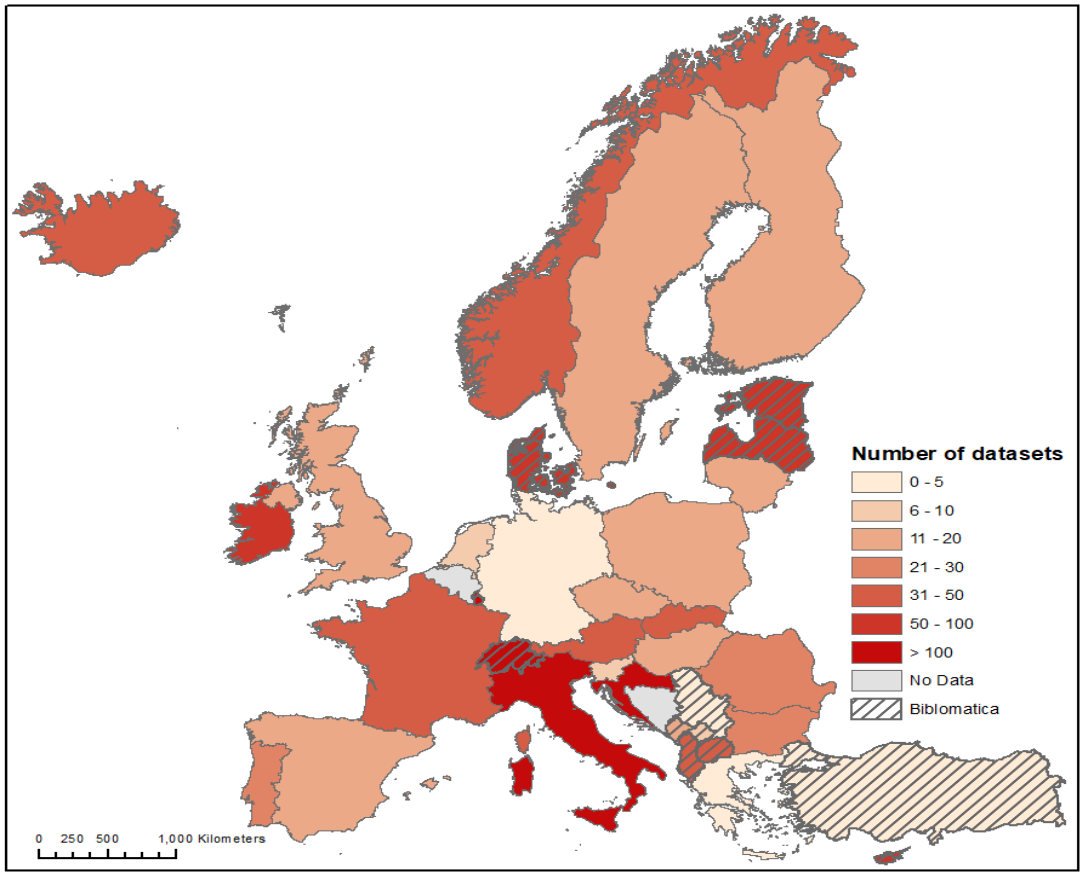

Figure 0. Member States[4] participating in the inventory and the number of datasets provided.

The inventory of 12 MS provided by Bilbomatica has the information stored in a harmonised way within 3 tables in an Access database, which makes the analysis for those 12 MS straightforward, as there are links between the three different tables. E.g. it is easy to generate overviews between the Land Use Attributes and Landscape Characteristics (LUAs/LCHs) and the resource descriptions that provide information for those LUAs/LCHs. An overview can be generated on how many times a dataset provides information for the different LUAs/LCHs. Out of this overview the most important datasets within a Member State that provide information for the land use inventory can be depicted.

[3] 36 MS as Great Britain and Northern Ireland were seen as two MS.

[4] Ireland participated in EEA's inventory. Data of Ireland is not used in this assessment as it became only recently.

Out of these 12 MS provided by Bilbomatica, 2 MS (Kosovo and Serbia) only appear in the Resource description worksheet from the Access database with descriptions of 8 and 1 datasets, respectively. They provided information on which data sources are available, but no information on how these relate to LUA/LCs. Two other MS provided very limited information concerning the LUAs/LCHs that can be provided. Republic of North Macedonia (38 datasets) and Turkey (5 datasets) could only provide information for LUA *Residential* and *Other uses (Nature protection)*, respectively. No information on LCHs was available within these two MS according to the Bilbomatica's inventory.

The United Kingdom provided two databases as the data availability for Great Britain (England, Wales and Scotland combined) differs a lot compared to Northern Ireland. Many national datasets cover Great Britain, with Northern Ireland managing its key data resources independently (different reference grid, different mapping agency).

Germany provided an overview on inventories that are available nationwide. They delivered and described only two datasets in the Excel file, while more datasets were presented in the accompanying report. Next to the nationwide datasets there are also open geodata in high resolution that are provided by the "Länder" Thuringia, Saxony, North Rhine-Westphalia, Hamburg and Berlin which were not listed.

The land use inventories provided individually by the 24 MS were all accompanied with a report giving some background information with different level of detail. The MS Portugal and Sweden were exceptions as an accompanying report was lacking. The inventory, i.e. Access database provided by Bilbomatica was not accompanied with an inventory report.

Despite of the fact that information was requested for the green-marked fields (i.e. those relevant for CLC+ Legacy), most of the MS did a complete inventory for all LUAs and LCHs (at least up to level 3) listed in the Excel file sent around with EEA's request. However, some MS – following the request expressed in the call - limited their inventory to (mainly) the LUAs/LCHs indicated as relevant for the CLC+ Legacy instance, i.e. the green marked LUAs and LCHs, which are Hungary, Iceland, The Netherlands and Sweden. For those MS that provided information limited to the green marked LUAs/LCHs the analysis is limited and restricted to the LUAs/LCHs indicated as relevant for the CLC+ Legacy instance (as requested in the call).

The level of detail provided by MS was sometimes not coherent. Main point is that the MS in the Bilbomatica inventory contain information on the availability of Land Use Attributes (LUAs) at level 0. The request to deliver information on the availability of LUAs at level 0 came as an additional request to the MS on September 5th, 2019. Most MS did not provide that information as in the Excel file no rows were introduced for providing information at level 0 on availability, resource title and relevant field or attribute.[5] Although Hungary and Iceland did provide that information. **This imbalance makes it difficult to compare the individual MS with the ones from the Bilbomatica inventory**. Furthermore, some level 0 LUAs are needed to derive CLC+ Legacy and LULUCF instances. To overcome this problem the level 1 LUAs hierarchically fallen under the level 0 LUAs Industries and Residential were taken as mandatory for the CLC+ Legacy instance. In an additional request for clarification it would be good to

[5] However, when MS activity was already running (in September 2019) MS were asked in an e-mail to use a corrected table, but this was restricted for two fields only (LUA level-0 *Industrial* and *Residential*) and came early within the contract duration when only one country (Romania) has delivered yet. It must be noted though that the excel sheet was not amended (no extra rows added) according to the request, thus many MS did not find the way to answer the extra request.

standardise and improve the request to the MS by asking MS to check if they have data available at level 0.

The availability of national data that can provide information about a specific LUA and/or LCH is registered differently between MS. Some MS (e.g. Bulgaria, Italy, Liechtenstein, Lithuania, Romania and United Kingdom) restricted themselves by only indicating if data is available by marking the "Check" attribute with "Yes", while if data is not available the attribute was not marked with "No" leaving it up to reader if data is not available, if data was not relevant for the MS or if it was just forgotten to check/mark the specific LUA/LC. Also some MS (e.g. Germany, Hungary, Iceland, The Netherlands and United Kingdom etc.) indicated if specific LUAs/LCHs were not relevant for the MS as these LUAs/LCH do not exist in the MS landscape. The availability of those LUAs/LCHs is then often marked with NR (Not Relevant), No or NA (Not Applicable).

The attribute "Relevant field" in the LUA/LCH sheets was interpreted differently by the Member States. It was meant to provide information about which field (or attribute) of the dataset mentioned (resource) could provide information for that specific LUA or LC. Bilbomatica interpreted it differently as "Field to register keyword themes that characterise the resource when the resource is too generic to be defined only with one theme". Some MS did not provide information at all for this attribute "Relevant field" or only for a limited number of LUAs/LCHs. Some reasons mentioned by MS for not providing information for this attribute were:

- some of the datasets concerned do not have an attribute structure where a 'field' as such can be selected (eg. OSM, Cadastre)
- a combination of various classes from various datasets make up the necessary information (instead of a field, rather a query rule set would be meaningful to describe the situation)
- many datasets have several representations (raster, vector, different resolutions, version numbers) where a given information content is found in different ways
- no access to the datasets, so no one apart from data owner will ever have a view of the original fields, only that of a processed/resampled dataset (e.g. forestry data) where field name is yet unknown.
- the data source has only a single field in the attribute table or the relevant field is easily identifiable because other fields are standard ones (e.g. ID, Area, etc.).

2.2 EAGLE elements needed for creation of CLC+ Legacy and CLC+ LULUCF instances

The EAGLE elements as indicated in the service request sent around to the Member States differ slightly from latest version mentioned in the final report of Task 2 Semantic composition / ontologies of the service contract No 3436/R0-COPERNICUS/EEA.57664. Especially the number/type of LUAs/LCHs requested for the derivation of CLC+ Legacy are deviating from each other. The reason for this lies in the timeline of the two actions: Task 2 work and report was created later than the service request to MS was released, and it contains a revised (usually broader) list. Once MS has been contracted there was no way to significantly change the scope of work for them[5].

EEA's request to the MS for the CLC+ Legacy instance consisted of 25 LUAs (13, 10, 2 for level 1, 2 and 3, respectively) and 61 LCHs (18, 17, 24 and 2 for level 1, 2, 3 and 4, respectively). To overcome above mentioned problem and come to these 25 LUAs the LUAs *Industries* and *Residential* at level 0 indicated as relevant to derive CLC+ Legacy were added by the level 1 LUAs *Manufacturing/producing industry*,

Energy production and *Permanent residential, Residential Use with Other Compatible Uses* and *Residential Use with Other Compatible Uses*, respectively. EEA did not define in their request which LUAs and LCHs were needed to derive CLC+ LULUCF instance as the LULUCF priority came later than the release of the inventory. As a number of MS restricted their inventory to the LUAs/LCHs needed for the CLC+ Legacy instance (as requested by the call), the analysis for the CLC+ LULUCF instance has to take care of this discrepancy between MS inventories.

In the report of task 2 "Semantic composition / ontologies" of the previous contract, the LUAs and LCHs that are needed to derive CLC+ LULUCF instance were indicated. Compared to CLC+ Legacy instance there are in total 19 and 40 additional LUAs and LCHs, respectively needed to derive CLC+ LULUCF instance. From those 19 LUAs only 16 were taken into account as 3 of the indicated LUAs (*Services, Transport networks, Logistics, Utilities* and *Inland water function*) relevant for CLC+ LULUCF were at level 0, for which no information was provided by MS. Also for the 40 LCHs a subdivision was made due to the fact that 16 LCHs were not appearing in the Excel file sent to the MS (hidden columns).

The LUAs *Agriculture* (level 1), *Power Distribution Services* and *Water Infrastructure* (level 2 under *Utilities* (level 1)) were not marked as mandatory in the request from the MS. The LCHs *Fruit and berry plantations* (level 2), *Inland water surface* (level 1)[6] and *Brine* (level 3 under Salinity (level 2)) were not part of the MS request, either. These were later marked as needed to derive CLC+ Legacy according the results presented in the report of task 2 of the previous contract. Also some LUAs/LCHs mentioned in the MS request were no longer in the list provided under the previous contract (*Salinity* (level 2), *Brackish, Fresh* (both level 3)). See the report of task 2 "Semantic composition / ontologies" for the EAGLE elements requested in the service request to the MS (marked green for CLC+ Legacy instance) and the EAGLE elements needed to derive CLC+ LULUCF instances.

Another complicating factor in the analysis of LCHs needed for the derivation of CLC+ LULUCF instance is the fact that a number of the needed LCHs were not visible in the Excel file sent to the MS as they were in intentionally hidden columns (to make the table easier to look at). Except the MS taken part in the inventory made by Bilbomatica no MS did report on these LCHs (except Italy).

To sum up chapters 2.1 and 2.2 due to inconsistencies in the EEA request, different ways of data collection information and different focus of member states, information provided by Member States was partly incoherent and not all possible information was provided by some MS.

2.3 Methodology

The approach followed in the assessment consisted of the following steps:

- Reading through the reports and make use of relevant issues in the analysis
- Sending out request for clarifications to the MS mainly regarding the Excel sheets with the information on the availability of national data for the LUAs and LCHs (checks on availability of data, resource title and relevant fields)
- Compiling for the different levels of LUAs and LCHs a database on the availability of national data of all MS for the LUAs/LCHs requested in the Excel file sent out by EEA
- Compiling graphs and tables with the number of MS providing information on the different LUAs and LCHs
- Compiling graphs and tables with the number of LUAs/LCHs per country

[6] Reason for this is that information on water surface is provided by CLC Backbone (~LCC).

- Putting all MS resource descriptions into one database
- Develop queries to categorize the different attribute or characteristics of the datasets provided by all MS
- Assessment of the data processed and presented in the graphs, tables and reports
- Summary assessment of results

3 ANALYSIS LAND USE ATTRIBUTES

Table 1 shows the total number of requested LUAs by EEA for the different levels, and the LUA's needed to derive the CLC+ Legacy instance and the additional ones to derive CLC+ LULUCF instance. Member States reported if they have national data that comply with the LUAs. The LUAs needed to derive the CLC+ LULUCF instance were not specifically requested by EEA at the Member States. A number of MS did only report on the mandatory (or green marked) LUAs i.e. the ones requested by EEA to derive CLC+ Legacy instance (see section 3.2 and Annex 7.3). From the total of 28 LUAs needed to derive CLC+ Legacy only 25 were requested by EEA as 3 LUAs were added to the list after the release of EEAs request to the MS. The LUAs at level 0 (Industries and Residential) were only reported by Hungary, Iceland and the MS participating in the Bilbomatica inventory. To make an European assessment possible the level 1 LUAs hierarchically fallen under these level 0 categories were taken as mandatory.

Table 1. Number of Land Use Attributes requested by EEA from the Member States.

	LUAs (all)	**LUAs CLC+ Legacy**	LUAs CLC+ LULUCF
level 1	30	13	5
level 2	48	10	5
level 3	45	2	6
level 4	7	0	0
Total	130	25	16

- Numbers LUAs CLC+ Legacy could be for level 1 = 14 and level 2 = 12 which makes a total of 28 LUAs when taking into account the additional added LUAs (see section 2.2).
- Instead of 19 LUAs needed for CLC+ LULUCF only 16 were taken into account as 3 indicated LUAs relevant for CLC+ LULUCF where at level 0 for which no information was provided by MS (see section 2.2).

3.1 Number of LUAs per MS (all, CLC+ Legacy, CLC+ LULUCF)

Figure 1 presents the number of LUAs per level that MS reported to be present at national level. Note that this figure refers to all possible LUAs, while Figure 2 and 3 focuses on ones requested by EEA. The total number of LUAs of 130 is never reached. MS that can provide national information for more than 60 LUAs (almost 505 of all LUAs) are Albania, Croatia, Czech Republic, Denmark, Spain, Finland, France, Italy, Lithuania, Montenegro, Norway, Poland, Slovakia and Slovenia. The maximum of 104 LUAs could be provided by Italy. However, most of the Italian data is only available for specific regions. Also, for other MS there could be problems gaining access to good quality information (data accessibility, national coverage, recent information, querying needed to derive LUA etc.). See for more detailed analysis on the data availability and quality chapter 5.

MS such as Hungary, Iceland, The Netherlands and Sweden score low numbers as they focussed only on the (mandatory) LUAs needed to derive CLC+ Legacy. MS for which only very limited data (=<20 LUAs i.e. 15% or less) seems to be available are Estonia, Hungary, Latvia, Liechtenstein, Republic of North Macedonia and Turkey.

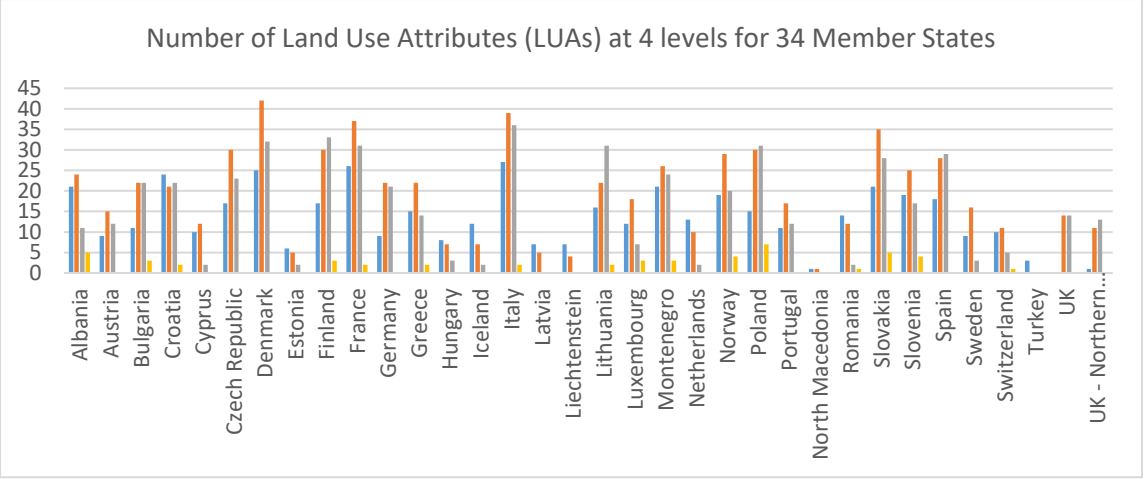

Figure 1. Number of Land Use Attributes for level 1-4 (blue, orange, grey and yellow, respectively) available at national level according to the Member State inventories.

Figure 2 shows the number of LUAs needed to derive **CLC+ Legacy instance** reported to be available by the MS. The number of LUAs needed to derive CLC+ Legacy is 25 (see Table 1). For the derivation of CLC+ Legacy 13, 10 and 2 LUAs are needed at level 1, level 2 and level 3, respectively. Four MS (Croatia, Italy, Netherlands and Norway) have data for all 13 LUAs at level 1 available, only Italy[7] has 10 LUAs at level 2 available. As can be seen from Figure 2 13 MS can deliver >=20 LUAs (i.e. >=80% of total of 25 LUAs), i.e. Albania, Croatia, Czech Republic, Denmark, Spain, Finland, France, Iceland, Italy, Montenegro, The Netherlands, Norway and Slovakia. MS with =<10 LUAs (or =<40%) are Austria, Cyprus, Estonia, Latvia, Liechtenstein, Republic of North Macedonia, Romania, Switzerland, Turkey, UK (Great Britain) and Ireland. These 11 MS, a mix of large and small MS, is almost 1/3 of all MS involved in the inventory and occupy a large surface area in Europe.

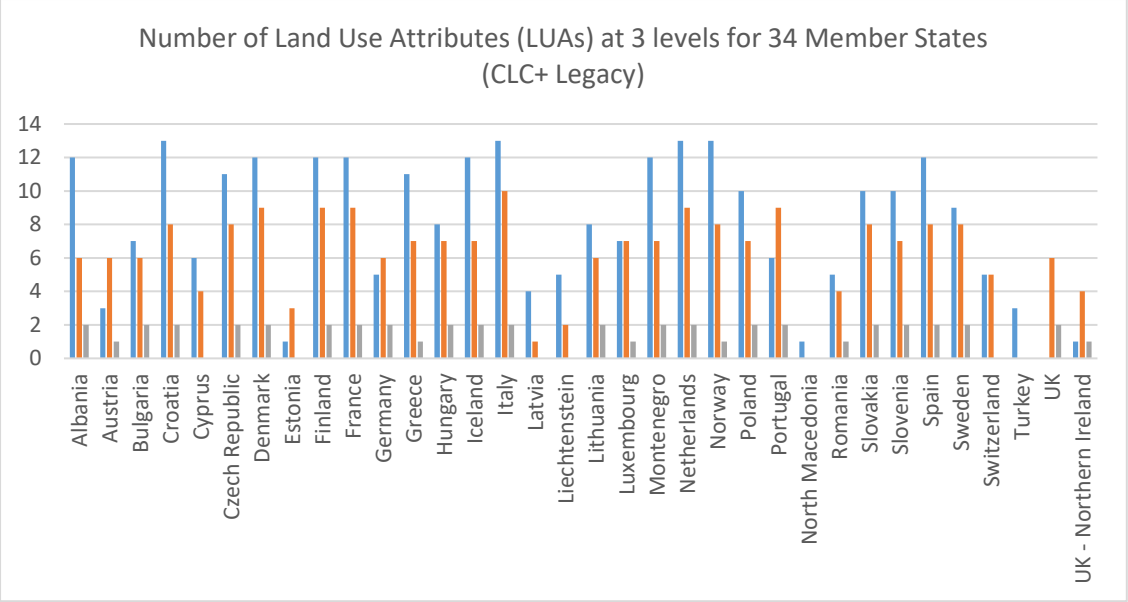

Figure 2. Number of Land Use Attributes for level 1-3 (blue, orange and grey, respectively) available at national level according to the Member State inventories to derive CLC+ Legacy instance.

[7] Italy's inventory came up with a lot of regional databases which makes national coverage difficult.

When analysing the data situation from the LULUCF point of view, it is important to note **that LUAs needed only for LULUCF were not requested by EEA in the call to MS**, thus we do not know if MS not filling in these field do have these data or not! To derive **CLC+ LULUCF** an 16 additional LUAs are needed. No MS have data available for all the 5 LUAs at level 1, Italy and Lithuania have data available for the 5 LUAs at level 2 and Denmark, France, Italy, Lithuania and Spain have data available for the 6 LUAs at level 3 needed to derive CLC+ LULUCF (see Figure 3). In section 3.2 and Annex 7.3 the additional LUAs needed to derive CLC+ LULUCF instance are mentioned. Only Italy, Denmark, Finland and Lithuania could deliver 10 or more of the additional 16 LUAs. Also here it should be taken into account that MS like Hungary, Iceland, The Netherlands and Sweden score low (or even zero) numbers as they focussed only on the green-marked LUAs needed to derive CLC+ Legacy. The MS Cyprus, Estonia, Hungary, Iceland, Latvia, Liechtenstein, Luxemburg, Republic of North Macedonia, The Netherlands, Portugal, Romania, Switzerland, Sweden, Slovenia, Turkey, UK and Northern Ireland have <5 LUAs marked available, which is 50% of the MS (17 out of 34 MS).

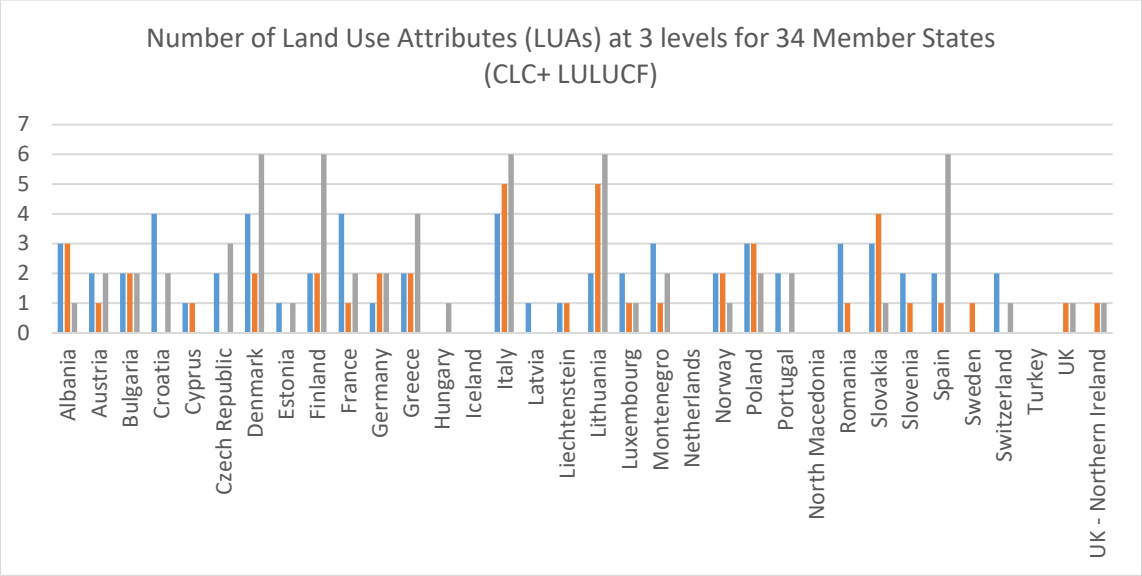

Figure 3. Number of Land Use Attributes for level 1-3 (blue, orange and grey, respectively) available at national level according to the Member State inventories that are needed in addition to derive CLC+ LULUCF instance.

In Annex 7.1 an overview of the number of Land Use Attributes (for different levels and in total) per Member State is presented.

Note: In the three Figures above, Northern Ireland (NI) and United Kingdom or Great Britain (UK or GB) are treated as separate MS, Kosovo and Serbia are missing as no info on LUA/LCH is provided.

3.2 Number of Member States covering specific LUAs (CLC+ Legacy, CLC+ LULUCF)

This section gives an overview on how many MS have national data that can cover each specific LUA needed to derive the CLC+ Legacy and LULUCF instances.

Sixteen out of the 25 LUAs (64%) needed to derive the **CLC+ Legacy instance** are covered by 20 or more MS (>=60%) with highest values for the LUAs *Sports infrastructure, Railway network, Nature protection* and *Road network*, which are available in 26, 27, 28 and 30 MS, respectively (75%-88% of

MS) (see Figure 4). However, if LUAs are covered by 20-25 MS it still means that 25-40% of the MS do not have information available.

For the LUAs *Salines, Other recreational services, Financial, professional and information services, Logistics and storage* and *Accommodation services* data is only available in 50% or less of the MS participating in the inventory, i.e. 10, 10, 13, 16 and 17 MS, respectively. The LUA *Salines* scores probably low as in a lot of MS *Salines* are not present at all and they are not marked as irrelevant/non relevant.

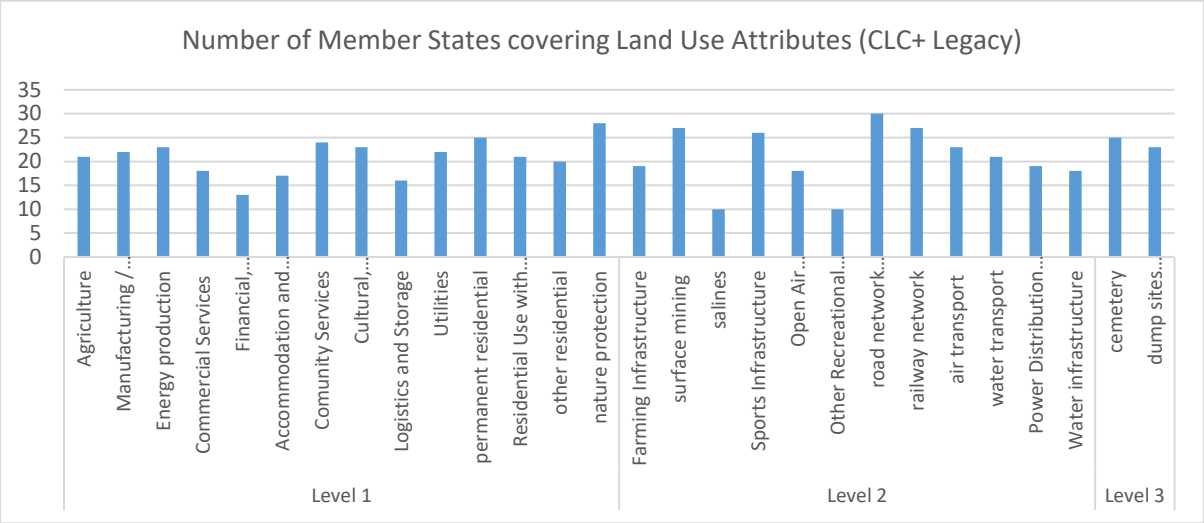

Figure 4. Number of MS covering the different LUAs needed to derive CLC+ Legacy instance. The two level 0 LUAs *Industry* and *Residential* are subdivided into *Manufacturing/producing industry* and *Energy production* and *Permanent residential, Residential use with other compatible uses* and *Other residential*, respectively.

The LUAs *Agriculture* (level 1), *Power distribution services* and *Water infrastructure* (level 2 under Utilities (level 1)) were missing as mandatory in EEA's request so not all MS did provide information. Still 21, 19 and 18 MS have reported data that comply with these LUAs. The numbers for these LUAs normally will be higher. In total 28 LUAs (25 + 3) could be considered relevant to derive CLC+ Legacy.

The LUAs additionally needed to derive **CLC+ LULUCF instance** are only available in a limited number of MS. Out of the 16 LUAs only the LUAs *Forestry*, *Transport networks* and *Urban greenery and parks* (19%) are available in 18 or more MS (i.e. in more than 50% of the MS) (see Figure 5). The LUAs *Commercial crop production, Semi-natural areas and national parks* and *Continuous cover* with appearances in 16, 16 and 10 MS respectively take an intermediate position. All 10 other LUAs are available in less than 26.5% of the MS.

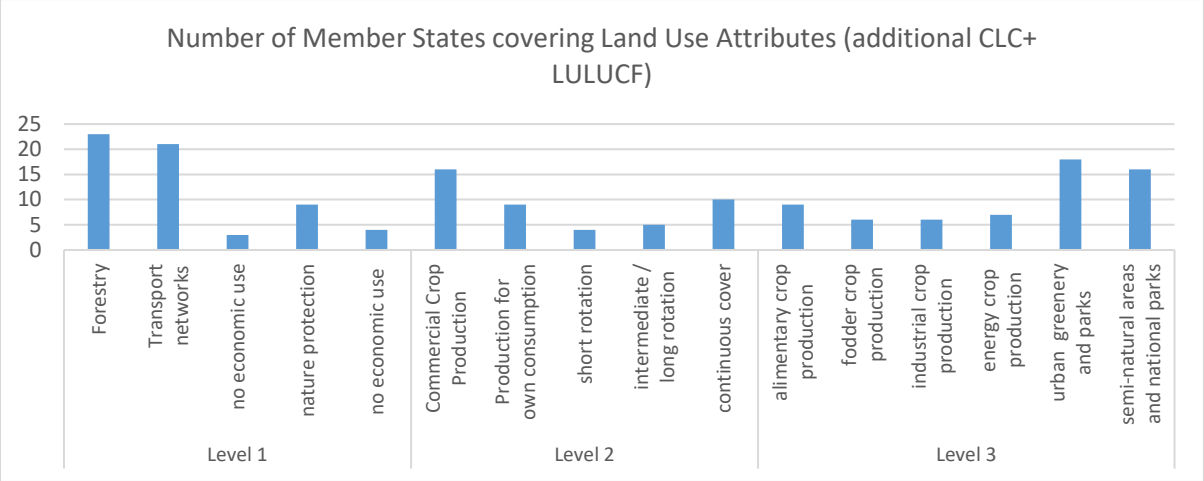

Figure 5. Number of MS covering the different LUAs needed to derive CLC+ LULUCF instance.

Some MS focussed their inventory only on the LUAs needed to derive CLC+ Legacy instance so numbers for the LUAs additionally needed to derive CLC+ LULUCF instance should be interpreted with care (see section 2.2)

In Annex 7.3 an overview is presented of the number of MS that can provide information on LUAs to derive the CLC+ Legacy and LULUCF instances. In the annex the LUAs that are coloured (red) were not indicated in the Excel file provided to the MS as relevant to derive CLC+ instances.

3.3 Main gaps

The inventory of Member States was not focussed on the CLC+ LULUCF instance making it difficult to get a good overview on the data available within the different MS. Especially the MS strictly following the EEA request, Hungary, Iceland, The Netherlands and Sweden did only provide information on LUA/LCHs related to CLC+ Legacy (marked in green in Excel sheet) resulting in an underestimation of data available for LUAs in the MS.

MS with very limited information regarding (all) LUAs. In total information on 25 LUAs was requested by EEA, while altogether 130 LUAs exist in the data model. No information is available for the MS Kosovo and Serbia. And also the information for Republic of Macedonia and Turkey is very limited. The situation for MS like Estonia, Hungary (only focussed their inventory on LUAs needed for CLC+ Legacy as requested by EEA), Latvia and Liechtenstein with data available for only 20 or less LUAs, which is 15% of the total of 130 LUAs existing in the data model, is problematic.

MS information on LUAs to derive CLC+ Legacy. For the derivation of CLC+ Legacy 25 LUAs were marked as needed. Only Italy matches with those 25 LUAs. A large group of 13 MS (40%) have data available for 20 or more (i.e. >=80%) LUAs needed. For a group of 11 MS, which represent almost one third of the MS, only 10 or less (i.e. =<40%) LUAs needed for CLC+ Legacy are available. The rest of the MS are in between.

MS information on LUAs to derive CLC+ LULUCF instance. Sixteen additional LUAs are needed to derive CLC+ LULUCF. Only 4 MS (12% of MS) could provide for 10 or more LUAs information (>=62.5% of total LUAs needed). From the 34 MS 17, which means that 50% of the MS, have data available for less than 5 LCHs (i.e. <30% of total of 16 LUA needed). As LUAs needed only for LULUCF were not requested by EEA in the call to MS, we cannot assess if MS leaving these fields empty do have these data or not.

Land Use Attributes (LUAs) with limited availability in MS (CLC+ Legacy). Road network and nature protection are the only LUAs needed for CLC+ Legacy that are available in more than 80% of the MS. The LUAs *Salines, Other recreational services, Financial, professional and information services* and *Logistics and storage* data are covered by less than 50% of the MS.

Land Use Attributes (LUAs) with limited availability in MS (CLC+ LULUCF). The LUAs additionally needed for CLC+ LULUCF are present only in 9-68% of the MS (see Annex 7.3). Most LUAs are available in less than 30% of the MS. Only *Forestry, Transport networks, Urban greenery and parks, Commercial crop production* and *Semi-natural areas and national parks* (i.e. 31% of LUAs needed) are available in more than 30% of the MS.

4 ANALYSIS LANDSCAPE CHARACTERISTICS

Table 2 presents the total number of the LCHs for the different levels, the LCHs needed to derive the CLC+ Legacy instance as requested by EEA from the MS and additional ones to derive the CLC+ LULUCF instance. Only 61 of the 67 LCHs needed to derive CLC+ Legacy were appearing in EEA's request as mandatory (green marked LCHs) to the MS as some were added after the release of EEA's request and some were in hidden columns (see Annex 7.4). From the 40 LCHs needed to derive CLC+ LULUCF instance only 24 were appearing due to (intentionally) hidden columns in the Excel file provided by EEA to the MS. Five respectively 11 of the level 2 and level 3 LCHs needed to derive CLC+ LULUCF instance were not appearing in the Excel file provided by EEA. The MS reported by Bilbomatica and Italy reported on all LCHs. So the number LCHs reported by the MS varied due to the fact that some MS only reported on the ones requested by EEA and that for a large number of MS some LCHs were hidden. This variability in LCHs reported by MS made the assessment complicated as the number of LCHs available is underestimated for the majority of MS.

Table 2. Number of Landscape Characteristics as requested by EEA from the Member States.

	LCHs (all)	LCHs CLC+ Legacy	LCHs CLC+ LULUCF
level 1	44	18	3
level 2	58	17	3
level 3	78	24	12
level 4	17	2	6
level 5	7	0	0
Total	204	61	24

* Numbers for LCH (all) could be for level 1 = 61; level 2 = 86 and level 3 = 112 if these LCHs would be appearing in all requests

** Numbers for LCHs CLC+ LULUCF could be for level 2 = 8 and level 3 = 23 if these LCHs would be appearing in all requests (see section 2.2)

*** Numbers for LCHs CLC+ Legacy could be for level 1 = 19, level 2 = 18, level 3 = 26 and level 4 = 4 if these LCHs would be appearing in all requests (see section 2.2)

4.1 Number of Landscape Characteristics per Member State (all, CLC+ Legacy, CLC+ LULUCF)

Figure 6 presents the number of LCHs per level that MS reported at national level. The total number of LCHs of 204 is never reached. At level 4 and level 5 the availability of LCHs is very limited. In total only 30 (level 4) and 2 (level 5) LCHs were reported by the MS.

MS that can provide information for more than 60 LCHs (>30% of total LCHs) are Albania, Denmark, Spain, Finland, Italy, Portugal and Slovenia. A maximum of 151 LUAs is reported by Italy. However, most of the Italian data is only available for specific regions. See for more detailed analysis on the data availability and data characteristics chapter 5.

Although far more LCHs then LUAs are concerned, i.e. 204 versus 130, there are a lot of MS that reported less LCHs then LUAs: Bulgaria, Croatia, Czech Republic, Germany, France, Latvia, Liechtenstein, Lithuania, Republic of North Macedonia, Montenegro, Norway, Poland, Romania, Slovakia, Turkey and Northern Ireland.

MS like Hungary, Iceland, The Netherlands and Sweden score low numbers as they focussed only on the mandatory LCHs needed to derive CLC+ Legacy (as required by EEA). Estonia, Latvia, Liechtenstein and Northern Ireland report 20 or less LCHs (<10% of total of 204 LCHs). The Republic of North Macedonia and Turkey did not report on any LCH.

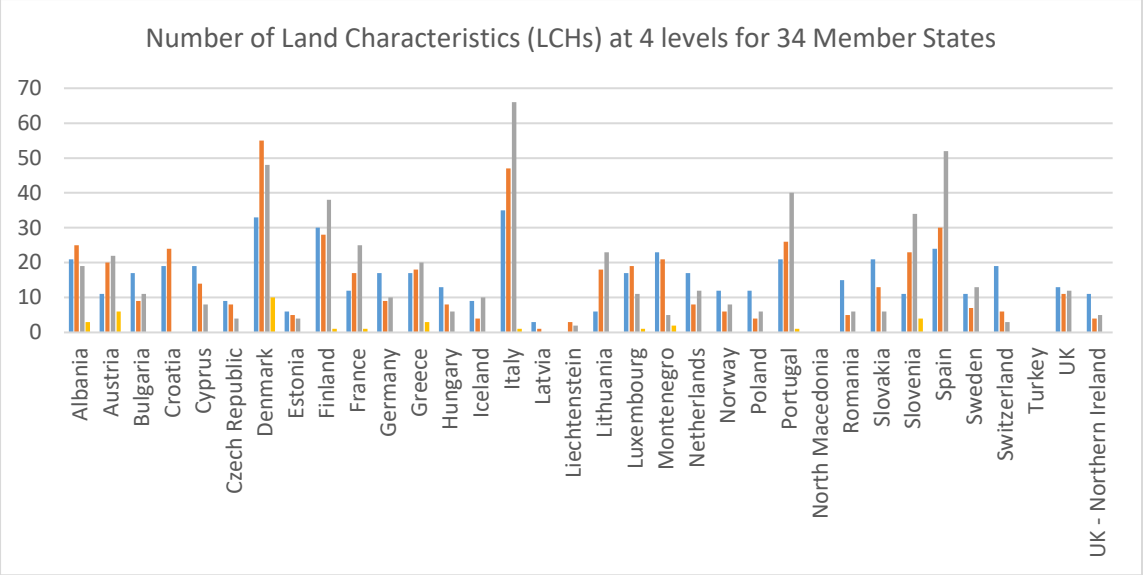

Figure 6. Number of Land characteristics available for level 1-4 (blue, orange, grey and yellow, respectively) at national level according to the Member State inventories.

Figure 7 shows the number of LCHs reported by the MS to derive the **CLC+ Legacy instance**. For the derivation of CLC+ Legacy 18, 17 and 24 LUAs are needed at level 1, level 2 and level 3, respectively. None of the MS reported all LCHs needed for CLC+ Legacy. As can be seen from Figure 7 18 MS (53% of MS) can deliver >=20 LCHs, i.e. Albania, Bulgaria, Germany, Denmark, Spain, Greece, Finland, Hungary, Iceland, Italy, The Netherlands, Poland, Portugal, Romania, Sweden, Slovakia, Slovenia and United Kingdom (Great Britain). MS that report =<10 LCHs (less than 16% of 61 LCHs requested) are Czech Republic, Estonia, France, Latvia, Liechtenstein, Luxemburg and Switzerland. Republic of North Macedonia and Turkey did not report on LCHs.

In a lot of MS less LCHs than LUAs are reported (although more LCH than LUA are required by EEA) to be available for CLC+ Legacy: Croatia, Czech Republic, Estonia, France, Latvia, Liechtenstein, Lithuania, Luxemburg, Republic of North Macedonia, Montenegro, Norway, Switzerland and Turkey.

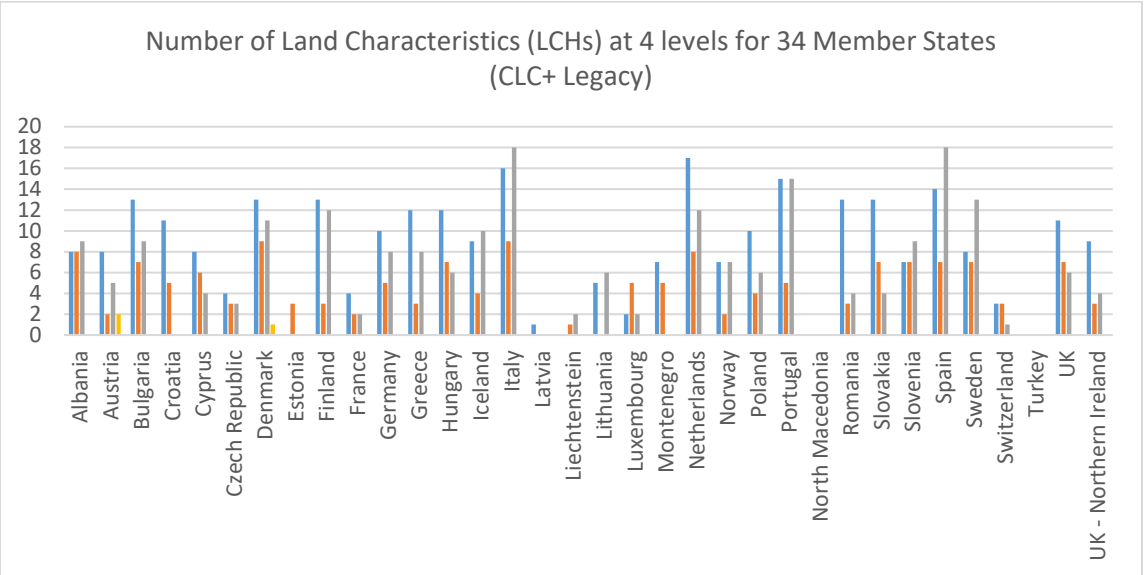

Figure 7. Number of Land Characteristics for level 1-3 (blue, orange and grey, respectively) available at national level according to the Member State inventories to derive CLC+ Legacy instance.

To derive **CLC+ LULUCF** an additional 24 LCHs are needed. Only a few MS such as Albania, Denmark, Finland, Italy and Luxemburg can provide 10 or more LCHs. The high numbers compared to the majority of other MS can be explained due to the fact that the national inventory of Italy and the inventory by Bilbomatica took into account all 40 (incl. 16 hidden ones) instead of the 24 LCHs relevant for CLC+ LULUCF.

The MS Bulgaria, Croatia, Cyprus, Czech Republic, Germany, France, Latvia, Liechtenstein, Lithuania, Norway, Poland, Romania, Switzerland, Slovakia, UK and Northern Ireland which is 64% of all MS have data available for less than 5 LCHs (less than 21% of 24 LCHs needed). Included in this calculation are Hungary, Iceland, The Netherlands, Republic of North Macedonia, Sweden and Turkey that did not (or incompletely) report on LCHs.

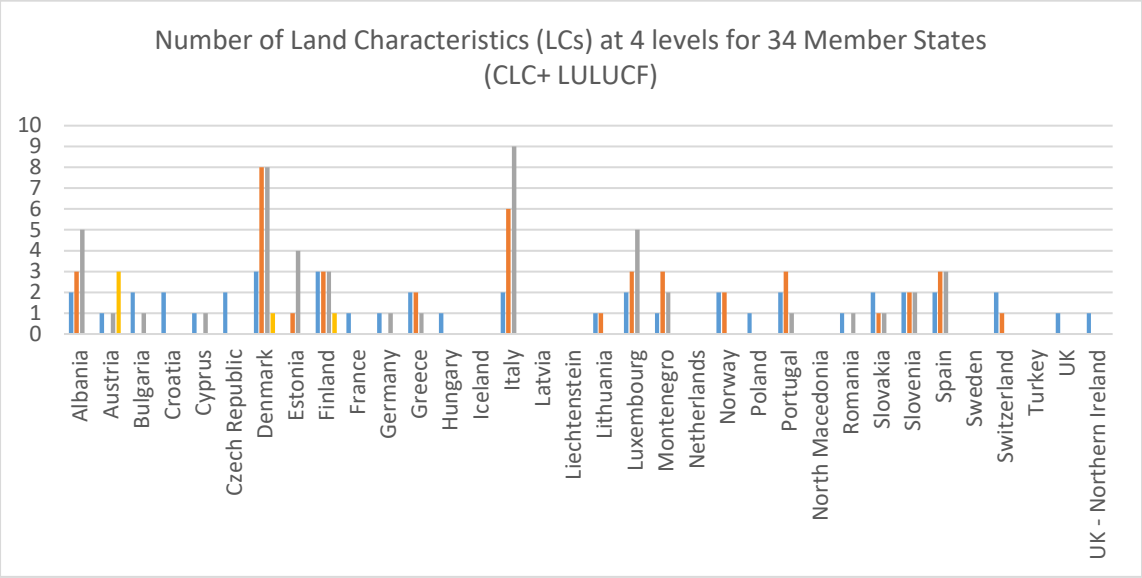

Figure 8. Number of Land Characteristics for level 1-3 (blue, orange and grey, respectively) available at national level according to the Member State inventories that are needed in addition to derive CLC+ LULUCF instance.

In Annex 7.2 an overview of the number of Land Characteristics (for different levels and in total) per Member State is presented.

Note: In the three Figures of this section, Northern Ireland (NI) and United Kingdom or Great Britain (UK or GB) are treated as separate MS, Kosovo and Serbia are missing as no info on LUA/LCH was provided.

4.2 Number of Member States covering specific LCHs (CLC+ Legacy, CLC+ LULUCF)

This section provides an overview on how many MS have national data that cover each specific LCH needed to derive the different CLC+ instances.

In total, information on 61 LCHs is needed to derive the **CLC+ Legacy** instance. The LCHs *Constructed, industrial and other artificial*, *Inland marshes, Inland surface water, Arable Crops, Pastures/meadows, Permanent crops* and *Needle leaved* were available in 23, 23, 23, 22, 22, 21 and 21 MS, respectively, which means that 60% or more of the MS can provide information for these LCHs (see Figure 9). All other LCHs are covered by 20 or less MS which means less than 60% of the MS. Only 26% of LCHs needed to derive CLC+ Legacy are available from 50% or more of the MS.

A large number of LCHs are only covered by 10 or less MS, which means that more than 70% of the MS do not cover these LCHs. These LCHs are mainly LCHs from level 2, 3 and 4.

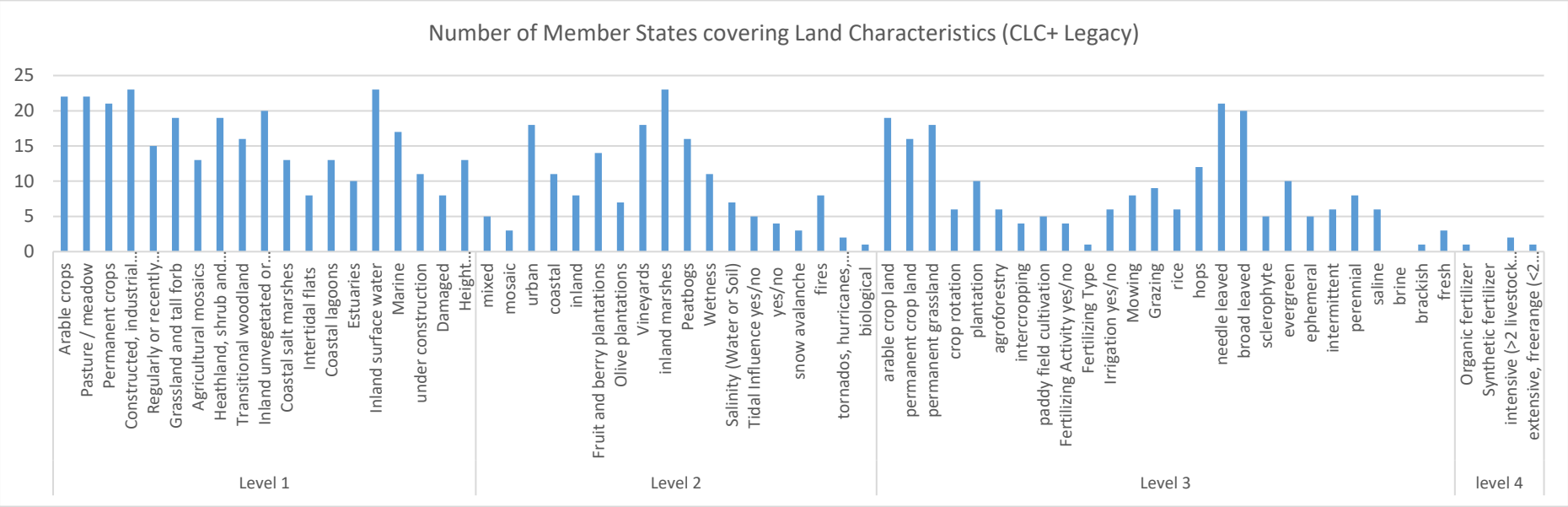

Figure 9. Number of MS covering the different LCHs needed to derive CLC+ Legacy instance.

The three LCHs *Fruit and berry plantations* (level 2), *Inland water surface* (level 1) and *Brine* (level 3 under *Salinity* (level 2)) were missing as mandatory in the EEA inquiry. So not all MS may have reported complete information on available data. Although still 14, 23 and 0 MS respectively have data available that comply with above mentioned LCHs. Also the LCH *Fertilizing type* (level 3) and *Organic and Synthetic fertilizer* (level 4) were not taken up in the inquiry as mandatory. In total 67 LCHs (61 + 6) could be considered relevant to derive CLC+ Legacy.

The only LCH out of 24 additionally needed to derive **CLC+ LULUCF instance** that is covered by more than 20 MS is *Woodland and forest* (73.5% i.e. 25 MS out of 34 MS) (see Figure 10). Three other LCHs are appearing in 10 or more MS, i.e. *Mire, bog, fen, Cultivation practices* and *Leaf form* with 16, 10 and 10 occurences respectively (<50% of the MS). All other LCHs appear in less than 30% of the MS.

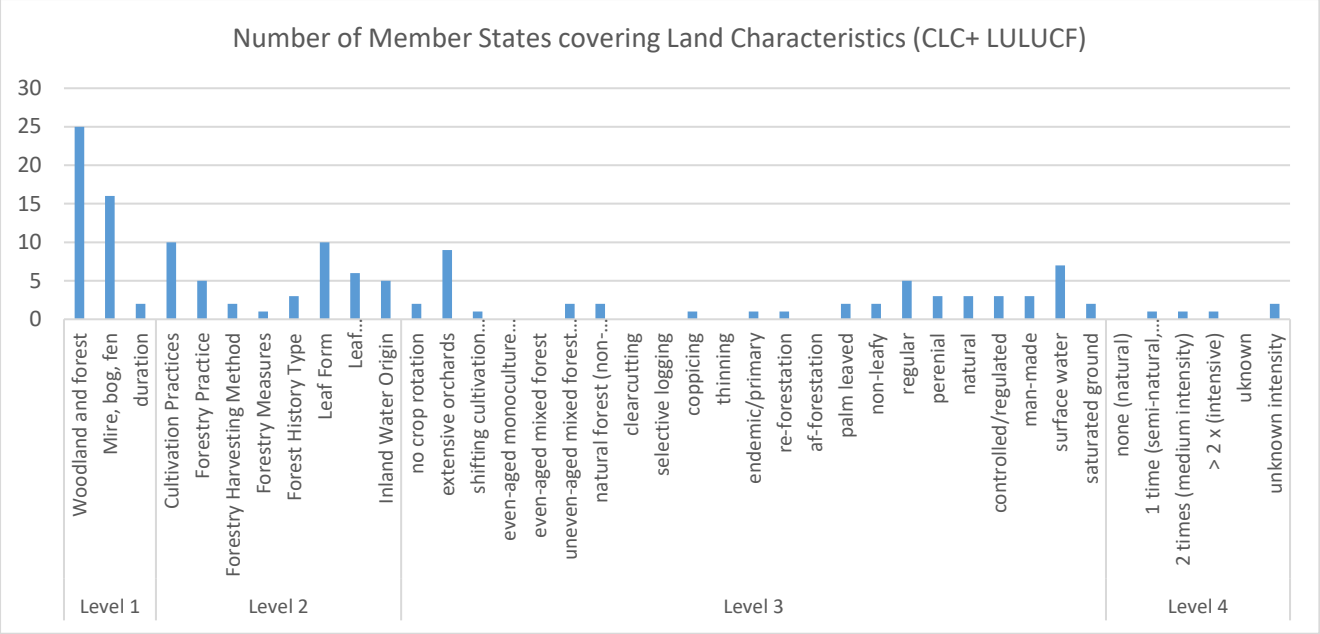

Figure 10. Number of MS covering the different LCHs needed to derive CLC+ LULUCF instance.

Some countries focus their inventory on the LCHs needed to derive the CLC+ Legacy instance, as required by EEA. Also a lot of the level 2 and level 3 LCHs (5 and 11 respectively) needed to derive CLC+ LULUCF instance were not appearing in the EEA request to the countries because the columns in the provided excel sheet were hidden intentionally. In total 40 LCHs (24 + 16) could be considered as relevant to derive CLC+ LULUCF instance. So the number of countries that could provide data on LCHs additionally needed to derive CLC+ LULUCF instance should be interpreted with care and may be underestimated.

In Annex 7.4 an overview of the number of MS that can provide information on LCHs to derive the CLC+ Legacy and CLC+ LULUCF instances is presented. In the annex the LUAs that are coloured (red) were not indicated as relevant to derive CLC+ instances and the ones that are coloured (blue) were hidden in the Excel file provided to the MS.

4.3 Main gaps

The inventory of Member States was not intended to inquire on the CLC+ LULUCF instance. Hungary, Iceland, The Netherlands and Sweden did strictly follow the EEA request, thus provided information **only** on the mandatory LUA/LCHs related to CLC+ Legacy instance (marked in green in Excel sheet). Another reason for the underestimation of LCHs availability by MS surely is that a number of LCHs were not visible for the MS due to intentionally hidden table columns. This effects especially the inventory for LCHs additionally needed to derive the CLC+ LULUCF instance. All together makes it difficult to get a comprehensive overview on the data available on LCHs needed for CLC+ LULUCF instance within the different MS.

MS with very limited information regarding (all) LCHs. Although far more LCHs then LUAs are requested in EEAs inquiry, a large number of MS (47%) provide less data for LCHs then for LUAs, which makes it clear that data availability is more problematic for LCHs. Also LCHs at level 4 and level 5 were nearly absent in most of the MS (and/or not reported).

The group of MS strongly limited by data availability for LCHs (=<20 LCHs i.e. <10% of total LCHs) consists of Estonia, Latvia, Liechtenstein and Northern Ireland. The Republic of North Macedonia,

Kosovo, Serbia and Turkey did not report on any LCH. A group of 7 MS (21%) have data available for 60 or more LCHs (>=30% of total of 204 LCHs). However, the maximum is 151 LCHs (Italy) out of a total of 204 LCHs. Also the MS taking part in the Bilbomatica survey did not reach high numbers although they explored all 283 LCHs.

In particular Bulgaria, Croatia, Czech Republic, Germany, France, Lithuania, Montenegro, Norway, Poland and Slovakia have far less data available compared to LUAs (LC-LUA >= -10). The inventory for LCHs seems to be less complete.

MS information on LCHs to derive CLC+ Legacy. Seven MS (21% of all MS) reported to have only data available for =< 10 LCHs out of the 61 LCHs, which is 16% or less of LCHs needed to derive CLC+ Legacy instance: Czech Republic, Estonia, France, Latvia, Liechtenstein, Luxemburg and Switzerland. A large group of 18 MS (53% of MS) have data available for 20 or more LCHs (33% or more of total LCHs needed). However, the maximum number of reported LCHs for which data is available in a country is 43 (Italy).

MS information on LCHs to derive CLC+ LULUCF instance. A vast majority of 64% of MS report that they have only data available for less than 5 LCHs (i.e. 21% of 24 LCHs needed). Take into account that a number of MS did not report on LCHs for CLC+ LULUCF.

Landscape Characteristics (LCHs) with limited availability in MS (CLC+ Legacy). Seven LCHs (*Constructed, industrial and other artificial, Inland marshes, Inland surface water, Arable Crops, Pastures/meadows, Permanent crops* and *Needle leaved)* are covered by more than >=60% of the counties. This means that all other LCHs are present in less than 60% of the MS. Only 26% of LCHs needed to derive CLC+ Legacy are available from 50% or more of the MS.

Landscape Characteristics (LCHs) with limited availability in MS (CLC+ LULUCF). Except for the LCHs *Woodland and forest, Mire, bog, fen, Cultivation practices* and *Leaf form*, all other LCHs appear in less than 30% of the MS.

5 RESOURCE DESCRIPTION

5.1 Number of datasets

The number of datasets available per MS and needed to cover the LUAs/LCHs requested by EEA varies greatly between MS ranging from 2 datasets in Germany to 468 datasets in Croatia. In most cases the number of records in Resource Description table corresponds to count of provided datasets. However Croatia, Italy and Luxembourg divided some of datasets thematically, temporally or spatially to sub-categories and provided in separate records. Croatia reported 468 datasets, which actually originating only from 248 datasets and have been subdivided by thematic focus (classes of dataset). In case of Italy there are in total 267 datasets, which are mainly regional - covering a province. Also, these datasets often originating from specific dataset and are sub-divided thematically. Database of Italy has also 16 datasets without any attributes filled, but only dataset names mentioned in comments field. Certain portion of datasets from Luxembourg from overall number 309 is also subdivided based on thematic categories. Two datasets from Poland as listed in resource title were sub-divided into two and three datasets respectively providing unique attributes and treated separately in this assessment. Different situation shows Norway where in total 39 datasets were provided and according to their numbering were grouped into 20 dataset categories (with further distinction by letters e.g. 1a, 1b, 1c) and representing different datasets. In delivery from Slovakia was in 13 cases missing any information about attributes and only resource title filled in Resource Description table. Northern Ireland database also containing 7 datasets which are also present in UK database, because they represent important contribution within Northern Ireland territory.

The following table 3 (see also Figure 0) shows an overview of “dataset richness” , i.e. the number of datasets MS listed in the Excel file with national information concerning LUAs and LCHs. Of course it says nothing of the total number of datasets available in a MS.

Table 3. Number of datasets provided by MS categorized into 7 groups.

Number of datasets	Member States
0 - 5	Germany, Greece, Serbia, Turkey
6 - 10	Kosovo, Liechtenstein, The Netherlands, Slovenia
11 - 20	Czech Republic, Finland, Hungary, Lithuania, Montenegro, Poland, Spain, Sweden, United Kingdom
21 - 30	Bulgaria, Portugal, Romania
31 - 50	Albania, Austria, France, Iceland, Norway, North Macedonia, Slovakia, Northern Ireland
50 - 100	Cyprus, Denmark, Estonia, Latvia
> 100	Croatia, Italy, Luxembourg, Switzerland

* More datasets of potential interest are provided in the German report but they were not analysed in detail.

The number of datasets listed by MS is not the main parameter that defines the completeness of the requested LUAs/LCHs. Comparing the number of datasets with the assessment provided in chapter 3 and 4 shows that some “dataset poor” MS score high in number of LUAs/LCHs provided (e.g. Greece, The Netherlands, Spain), while some “dataset rich” MS score low (Estonia, Latvia and Switzerland).

Next to the number of datasets and the number of LUAs/LCHs available per MS also the characteristics of the datasets define the usefulness. E.g. Italy has high number of datasets providing information for lots of LUAs/LCHs, but most of the datasets have a regional coverage making a national assessment difficult.

5.2 Characteristics of MS datasets based on resource description

According to the EEA's request MS provided for each dataset with information on LUA/LCHs a short resource description according to predefined characteristics or attributes. In this section for each characteristic a short description of the methodology to categorize the characteristic is followed by an assessment. An overview or figure per characteristic is presented which indicates per MS how many datasets belong to a category. In Annex 7.5 the complete overview per categorized characteristic for all MS is presented.

5.2.1 Temporal extent

Method

The attribute "Temporal extent" provides information about the date of dataset "production". Information related to date is provided with different precision. Majority of filled records refer to years, in some cases to months and days. Assessment of "Temporal extent" is done by extraction of text from individual records, referring to particular year. When there were more "years" occurring within one record, priority was assigned to: 1. Year of update/modification 2. Date of creation 3. Date of publication. In case that a range of years was stated, the most recent year was extracted. The figures provide information about the number of datasets per year between 2015 – 2019. Datasets produced before 2015, were assigned to category "Older". Records with term "continuous" were assigned to category 2019. Terms such as *since*, *permanent*, *current*, etc. are part of category "Other".

Assessment

The majority of datasets for the 12 MS Albania, Bulgaria, Cyprus, Denmark, Germany, Hungary, Kosovo, Latvia, Luxembourg, The Netherlands, Portugal and United Kingdom are from recent years (>=50% of data from 2015 onwards). Twelve MS listed data on LUA/LCH that are older than 2015 (>30% of the datasets): Austria, Czech Republic, Estonia, Liechtenstein, Lithuania, North Macedonia, Romania, Serbia, Slovenia, Spain, Switzerland and Northern Ireland. Out of these Estonia, Lithuania, North Macedonia, Serbia, Switzerland and Northern Ireland have 50% or more of their datasets older than 2015. More than 50% of the datasets provided by France, Italy, Montenegro, Poland, Slovakia and Turkey have "No data" on "Temporal extent". The MS Germany, Greece, Iceland, Liechtenstein and Norway have large proportions (>50%) of their datasets categorized under "Others". In short: most reported datasets are dated before 2015 or where their temporal extent is "Unknown" or "Other". For 25 MS the majority of datasets falls into this category.

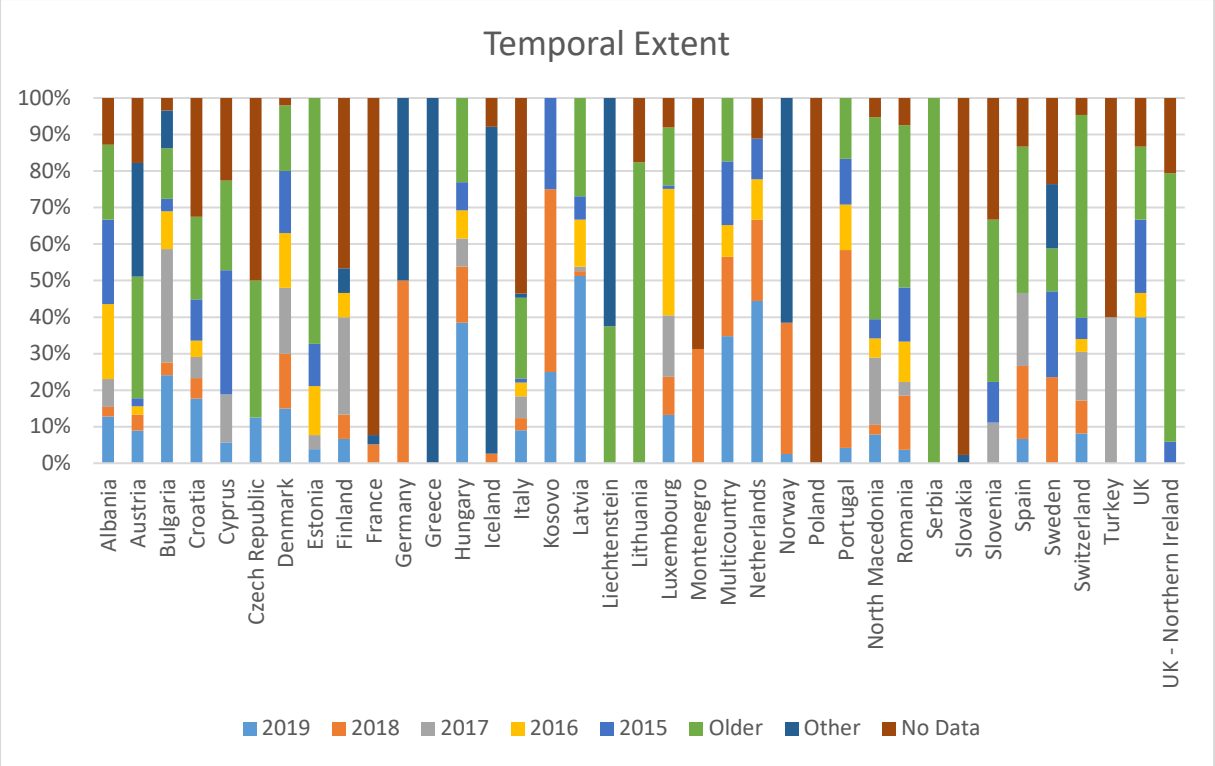

Figure 11. Percentage of MS datasets falling in different "Temporal extent" categories.

5.2.2 Language

Method

The attribute "Language" refers to the language in which the dataset (legend and documentation) was produced. MS delivered information as a text referring either to national language or English or both (national and English). If particular country name or country code was mentioned, the name was changed to "National". Data from UK and Northern Ireland belongs to Category "English".

Assessment

Almost all of MS have majority of provided datasets in their national language except Cyprus, Luxemburg, Montenegro and Serbia. MS with less than 10% datasets in English are Austria, Croatia, Estonia, France, Germany, Greece, Italy, Liechtenstein, Norway, Romania, Slovakia, Slovenia, Sweden, Switzerland and Turkey. Relatively high rate of unknown language (no data more than 25%) are in datasets of Italy, Kosovo, Montenegro and Slovakia. MS where high rate of datasets (more than 25%) in both their national language and English are the following: Finland, Hungary, Iceland, Portugal and Republic of North Macedonia. In conclusion, national language plays most important role in data characteristics since data are in first place used for purposes within the MS. Knowledge of national language is needed to use the datasets.

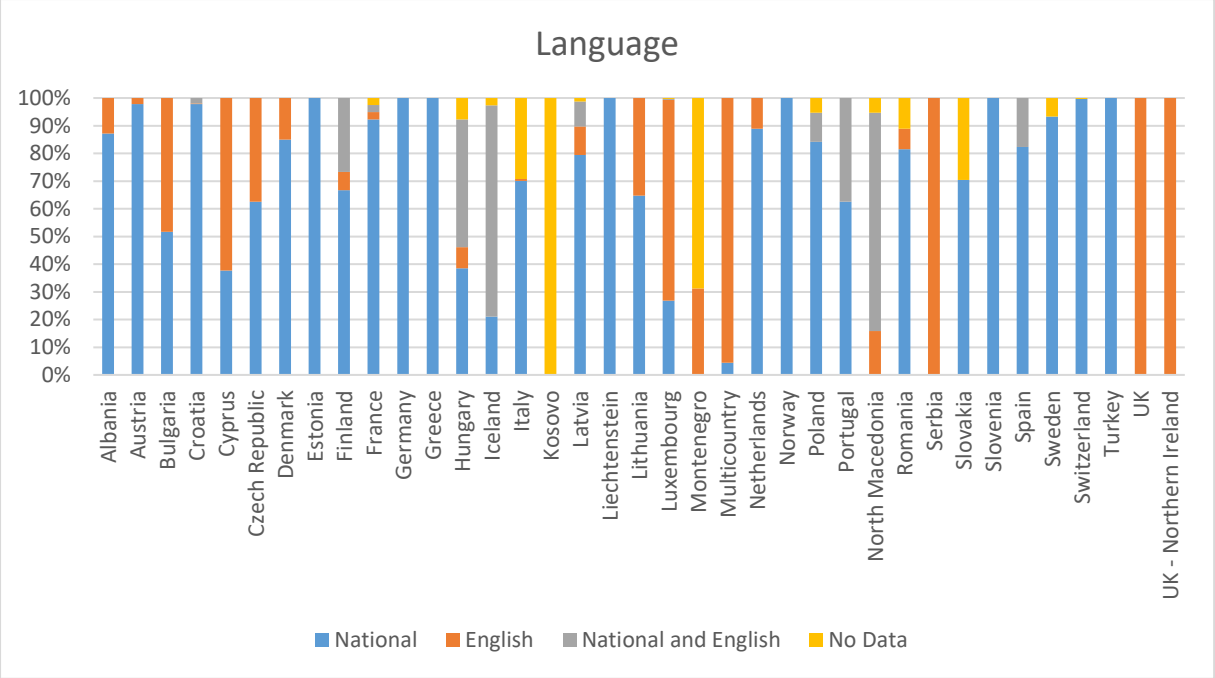

Figure 12. Percentage of MS datasets falling in different "Language" categories.

5.2.3 Coverage

Method

The attribute "Coverage" refers to the proportion of the country covered by the provided dataset as national, regional or local coverage. When data provided by MS covering the entire sovereign territory terms occurring in database are mainly: "national", "country" or name of the country. When data covering part of the country, mentioned terms are e.g. "local", "regional" or name of the local regional unit. Another case of sub-national coverages is datasets focus on specific land use categories. In a limited number of datasets the area covered is larger than the country or multiple MS. Accordingly, datasets in this assessment were divided into three categories: "National", "Local or regional" and "Multicountry".

Assessment

In almost all MS a large majority of datasets have national coverage. In 16 MS all datasets have national coverage. MS reported the largest percentage of local datasets (more than 25%) are Austria, Greece, Italy, Norway and Republic of North Macedonia. Only 4 MS (Croatia, France, The Netherlands and Switzerland) provide datasets with multi-national coverage. Three MS (Iceland, Poland and Slovakia) reported 25% or more of their datasets with no information on coverage. In conclusion, most datasets have national coverage as that was requested. In the five MS Austria, Greece, Italy, Norway and Republic of Macedonia a large part of the datasets does not have national coverage making it rather impossible to use them to provide information for specific LUAs/LCHs at national level. By the way in other MS (e.g. Germany) there may also exist more regional information but this was not requested and will be difficult to use.

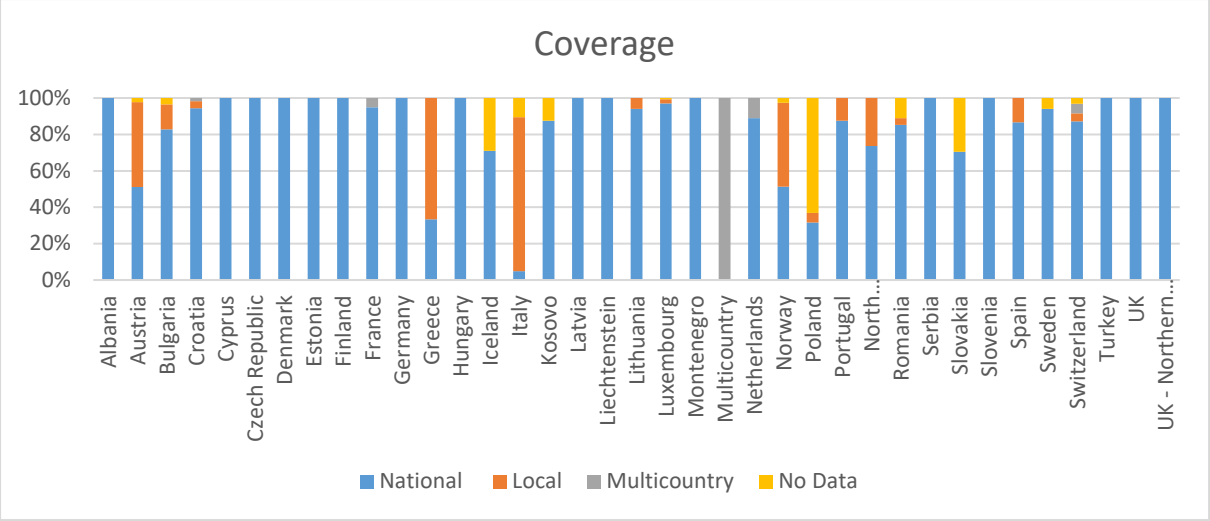

Figure 13. Percentage of MS datasets falling in different "Coverage" categories.

5.2.4 Representation type

Method

The attribute "Representation type" refers to spatial data representational format type. According to specification in the look up table provided to the MS it can contain 3 types: Raster, Vector and Tabular. These 3 types were accordingly filled into the database, unless records remained empty.

Assessment

In almost all MS the majority of datasets are in vector format. The exception are Albania and Turkey where raster databases dominate. Exclusively, the vector type is present in datasets from Czech Republic, Germany, Greece, Montenegro and Norway. Tabular type is present in datasets from 16 MS, but its proportion is rather low – less than 20%. Exceptions are Great Britain and Northern Ireland where more than 25% of datasets are in tabular representation type. For a large proportion (>20%) of the datasets from the MS Denmark, Estonia, Iceland, Italy, Kosovo, Latvia, Luxemburg, Serbia, Slovakia and Switzerland the data type is unknown.

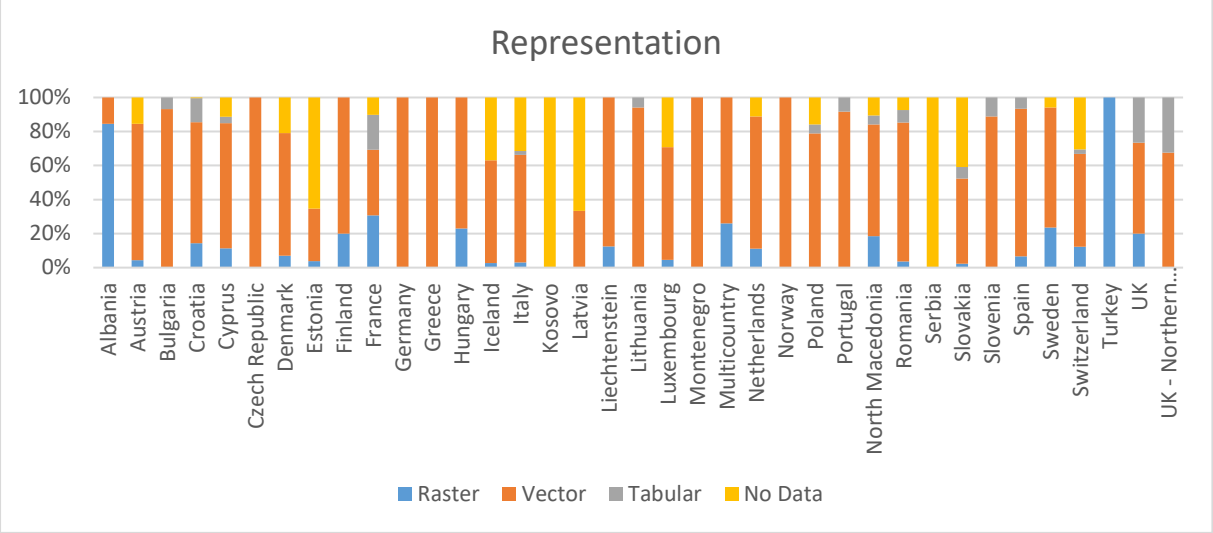

Figure 14. Percentage of MS datasets falling in different "Representation" categories.

5.2.5 Minimum mapping unit

Method

The attribute “Minimal mapping unit” (MMU) provides information about the minimum size of the objects being mapped. The data delivered by MS refers mainly to object size stated by units of area and length. These datasets were added to category “Known”. All other records where MS provided any information, but not explicitly size of objects, were added to category “Not Known”. In the case of Italy it seems that records within attribute “MMU” were exchanged with records within category “Resolution”.

Assessment

The number of datasets where MMU is known is relatively low and in general does not reaches 50%. Exceptions are Germany and Greece with 100%. The MS Bulgaria, Croatia, Finland, Hungary, Norway, Slovenia and Spain have between 20-50% of datasets for which MMU is known. For the MS Czech Republic, Iceland, Liechtenstein, The Netherlands and Norway a relatively high percentage (>=50%) of their datasets fall in the category “Not known”. The following 14 MS did not provide any information about MMU: Albania, Denmark, Estonia, France, Kosovo, Latvia, Luxemburg, Montenegro, Republic of North Macedonia, Romania, Serbia, Switzerland, Turkey and Northern Ireland.

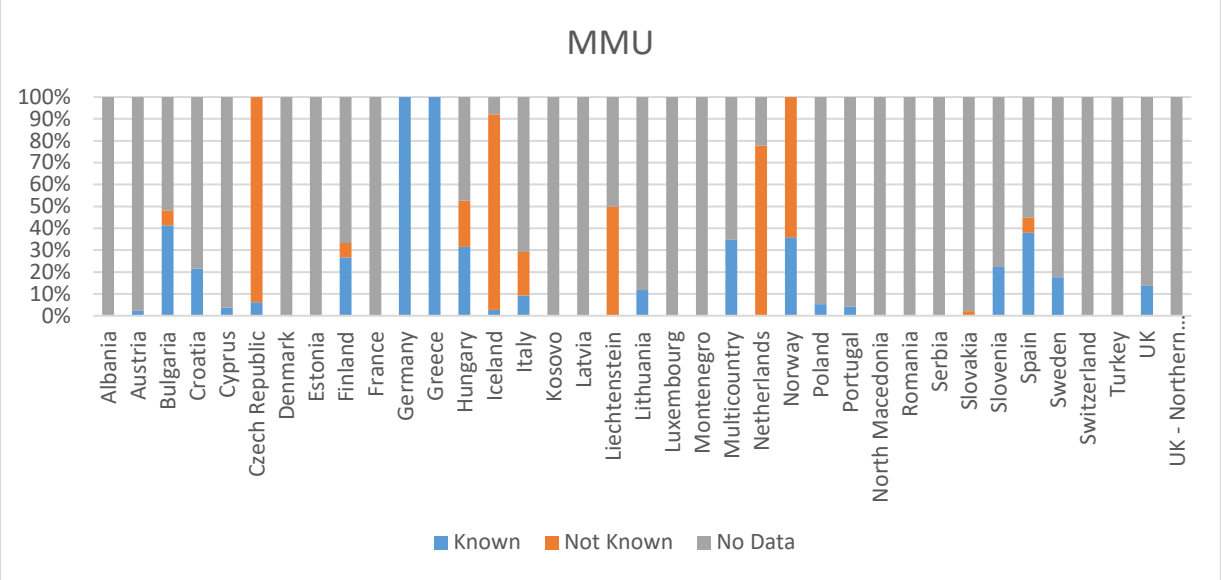

Figure 15. Percentage of MS datasets falling in different “Minimum Mapping Unit” categories.

5.2.6 Minimum mapping unit (detailed)

Method

The attribute “Minimal mapping unit” (MMU) provides information about the minimum size of the objects being mapped. The data delivered by MS refers mainly to objects size stated by units of area and length. Datasets with MMU of area up to 1 ha and length up to 100 m were assigned to category “Small”. Datasets with higher area and length were assigned to category “Large”. All other records where MS provided any information, but not explicitly size of objects, were added to category “Other”. In the case that dataset has different versions with different MMUs, smaller was taken into account. If records remained empty, datasets were assigned to category “No Data”.

Assessment

The number of datasets where MMU is known is relatively low and reaching 30% only in Bulgaria, Germany, Greece, Hungary, Norway and Spain with majority of small MMU. The only MS which provided datasets with large MMU are Austria, Croatia, Cyprus, Hungary, Iceland, Italy and Poland. Following 14 MS did not provide any information about MMU Albania, Denmark, Estonia, France, Kosovo, Latvia, Luxemburg, Montenegro, Republic of North Macedonia, Romania, Serbia, Switzerland, Turkey and Northern Ireland. In case of Italy it seems that records within attribute "MMU" were exchanged with records within category "Resolution".

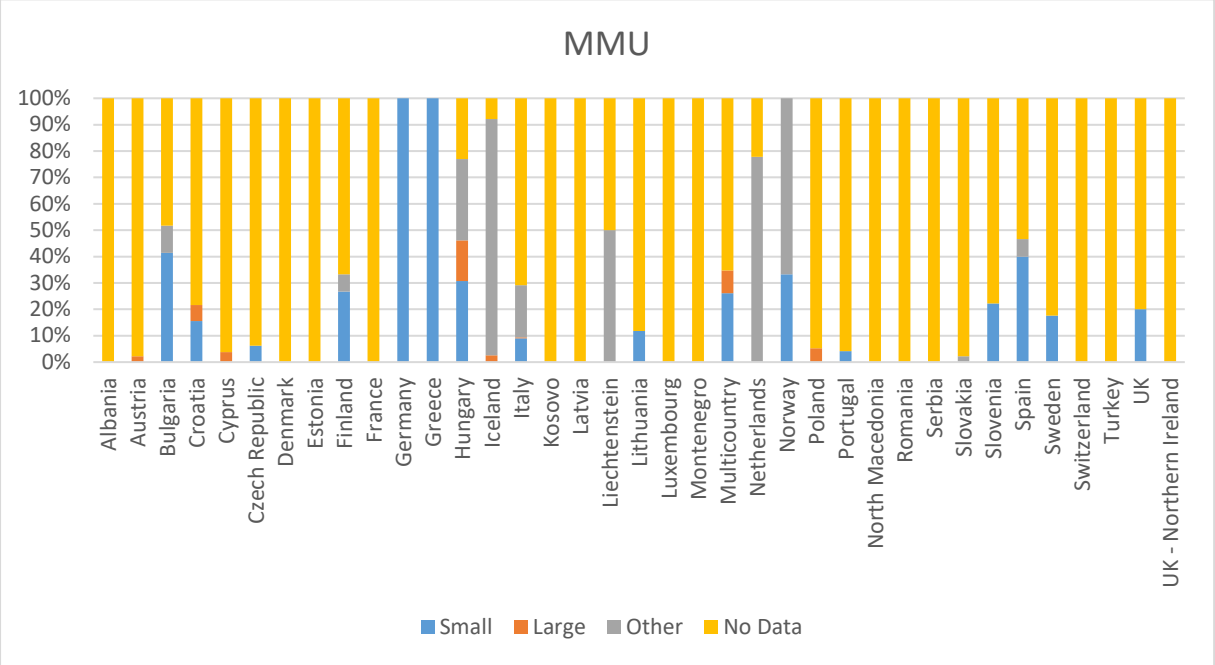

Figure 16. Percentage of MS datasets falling in different "Minimum Mapping Unit (detailed)" categories.

5.2.7 Format

Method

The attribute "Format" provides information about data format in which datasets are stored. Since there are many data formats in which spatial data could be stored, deliveries of MS giving information for this attribute differs considerably. In this assessment were selected 5 most common categories referring to data formats: 1. Shapefile, 2. GeoTiff, 3. Text, 4. WMS/WFS and 5. GML. Datasets were assigned to these categories accordingly. Since several datasets are stored in more than one format, counts of dataset belonging to each of selected common formats are added in the same order as reported above. All datasets stored in different data format were assigned to category "Others". If records remained empty, datasets were assigned to category "No Data".

Assessment

The ESRI shapefile is used by almost all MS (exceptions are Finland, Romania and Serbia). More than 70% of the datasets are stored in this format in Germany, Hungary, Kosovo, Liechtenstein, Lithuania, Montenegro, Slovenia and Spain. GeoTIFF is most common for datasets from Hungary, Sweden and Turkey (> 15%). MS with datasets with large proportion of different types of text format (>20%) are

United Kingdom and Northern Ireland. Datasets provided through web services WMS/WFS are most common in Albania, Poland, Serbia and Turkey (>30%). Datasets stored in GML format are produced mostly in Cyprus, Czech Republic, Denmark, Luxemburg, The Netherlands and Norway (>30%). MS with datasets with large proportions (>30%) in "Other" formats are Bulgaria, Finland, Greece and Norway.

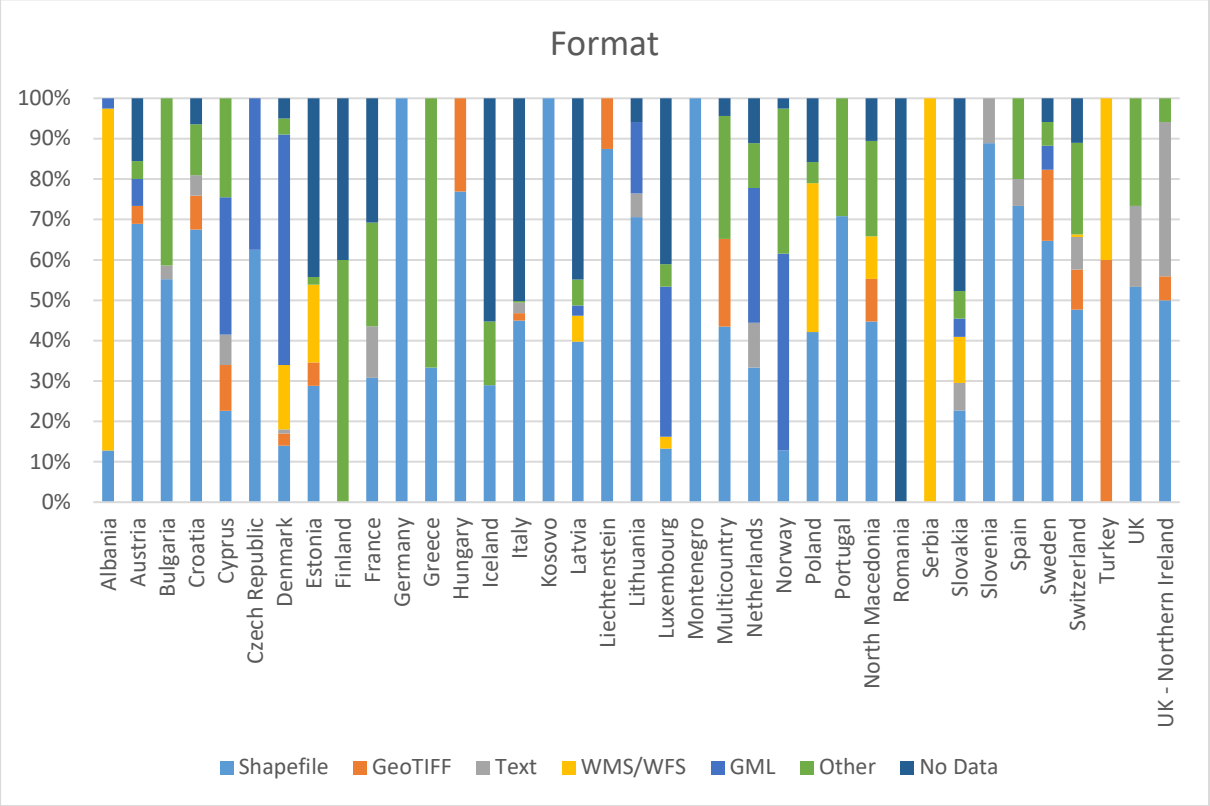

Figure 17. Percentage of MS datasets falling in different "Format" categories.

5.2.8 Update frequency

Method

The attribute "Update" provides information about the update frequency of a particular dataset. The MS provided information about the update of datasets in various formats. Records with temporal information are divided into two categories: "Within 1 year" and "More than 1 year". Any other information provided by MS not related to a time period was assigned to category "Other". If records remained empty, datasets were assigned to category "No Data".

Assessment

MS with datasets with high proportions (>= 50%) being updated within 1 year are Finland, Germany, The Netherlands, Portugal, Slovenia and Spain. MS with highest rate of datasets (> 30%) being updated with frequency more than 1 year are Czech Republic, Germany, Hungary, Sweden and United Kingdom (Great Britain). Relatively equal proportion of both categories is recorded at Germany, Sweden and United Kingdom. Highest proportion of datasets in the "Other" category (> 80%) are the MS Iceland and Liechtenstein. MS with none or less than 10% information regarding to update frequency are Albania, Kosovo, Latvia, Luxembourg, Montenegro, North Macedonia, Serbia, Switzerland, Turkey and Northern Ireland.

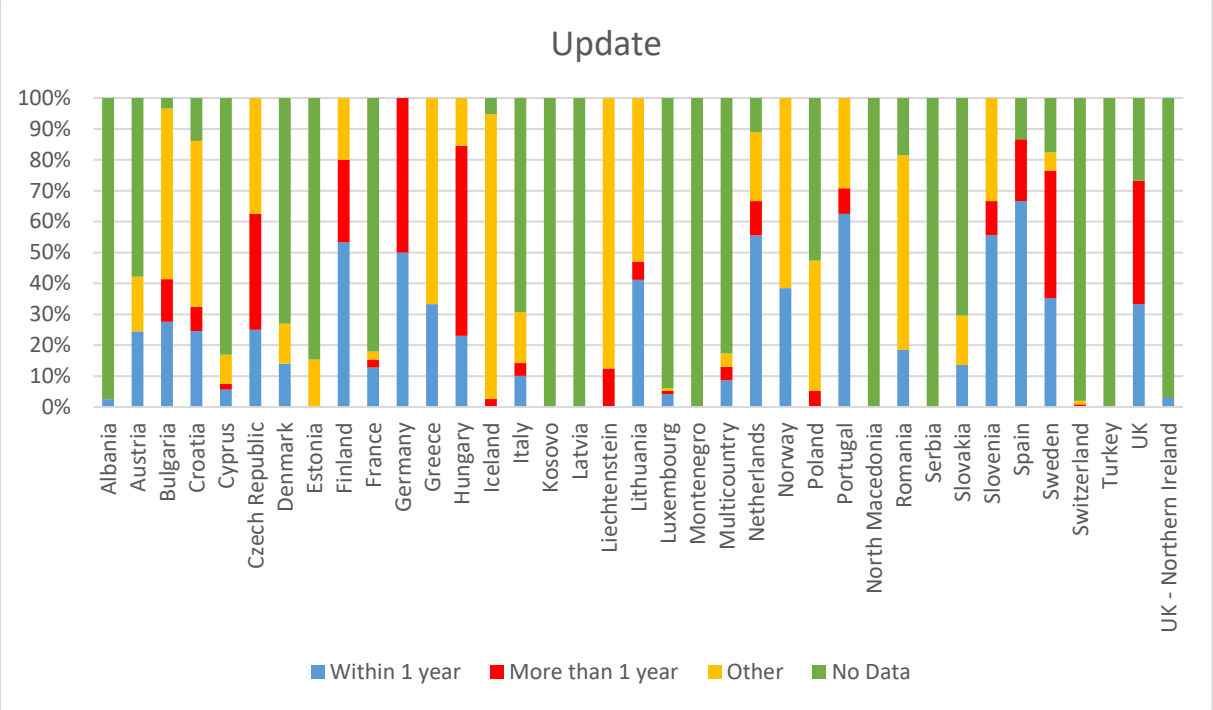

Figure 18. Percentage of MS datasets falling in different "Update frequency" categories.

5.2.9 Spatial resolution

Method

The attribute "Spatial Resolution" provides information about: 1. Resolution stated by size of pixel as a smallest element of spatial dataset in raster representation 2. Scale of spatial dataset represented by numeric map scale. Datasets with resolution of pixel size up to 100 x 100 m were assigned to category "High Resolution" and datasets with larger pixel size were assigned to category "Low Resolution". Datasets with map scale larger than 1 : 100 000 (covering small areas) were assigned to category "Large Scale" and datasets with map scale smaller than 1 : 100 000 (covering large areas) were assigned to category "Small Scale". All other records where MS provided any information, but not explicitly pixel size or numeric map scale, were added to category "Other". If records remained empty, datasets were assigned to category "No Data".

Assessment

In general, MS provided higher proportion of their datasets in map scale rather than spatial resolution. Exceptions are Sweden and Hungary where datasets with resolution or scale are in balance. Datasets with high resolution (>10%) prevail in Finland, Hungary, Liechtenstein, The Netherlands, Sweden and United Kingdom. Very limited number of low resolution datasets (<15%) has Austria, Finland, Italy, Poland, Romania, Switzerland and United Kingdom. MS with high proportion of datasets in small scale (>20%) are Greece, Latvia, Norway, Republic of North Macedonia and Romania. MS with high proportion of datasets in large scale (>80%) are Czech Republic, Germany, Lithuania and Spain. MS with low proportion of delivered information about spatial resolution (=<20%) are Albania, France, Kosovo, Luxembourg, Montenegro, Serbia, Slovakia and Northern Ireland.

Figure 19. Percentage of MS datasets falling in different "Spatial resolution" categories.

5.3 Access conditions

According to the EEA's request MS provided for each dataset with information on LUA/LCHs a short resource description according to predefined characteristics or attributes. In this section for each characteristic a short description of the methodology to categorize the characteristic is followed by an assessment. An overview or figure per characteristic is presented in which is indicated per country how many datasets belong to a category. In Annex 7.6 characteristics describing the access conditions are categorized.

5.3.1 Access

Method

The attribute "Access conditions" refers to access conditions and policies related to the use of datasets. According to the specification in the look up table provided to the MS, the attribute can contain 5 types: Major and multiple constraints for full free and open policy, Single severe constraints for full free and open policy, Creative Commons BY 3.0 license, Minor constraints for full free and open policy, Full free and open data policy. These 5 types were accordingly filled by the MS. In case that other information was filled i.e. partly/do not correspond to definition in look up table, dataset was assigned to the category "Other".

Assessment

The MS which provided the majority of their datasets with Major and multiple constraints for full free and open policy (one of the categories defined in the look up table) are Germany and Liechtenstein. Also the MS Finland, Greece, Hungary, Poland, Turkey and United Kingdom have relatively large part (20-50%) of their datasets with such constraints. Single severe constraints for full free and open policy is characteristic mainly for datasets from Croatia, Greece, Hungary, The Netherlands, Norway and Switzerland, however with relatively low rates between 10-40%. Although in the Republic of North

Macedonia the proportion reaches 65%. Creative Commons BY 3.0 license is mainly represented (>=20%) in Austria, Cyprus, Hungary, Slovakia and Spain. More than 50% of datasets in Czech Republic, Estonia, Finland, Norway, Romania, Serbia, United Kingdom and Northern Ireland are with minor constraints for full free and open policy. Full free and open data policy is mostly represented (>=50%) in Albania, Croatia, Denmark, France, Poland, Portugal, Slovenia and Sweden with majority of datasets falling into this category. MS with datasets falling into category "Others" so they do not correspond to definition in look up table are Austria, Iceland, Italy, Lithuania and Portugal. MS that reported datasets within all 5 defined categories are: Croatia, Cyprus, Italy and Slovakia.

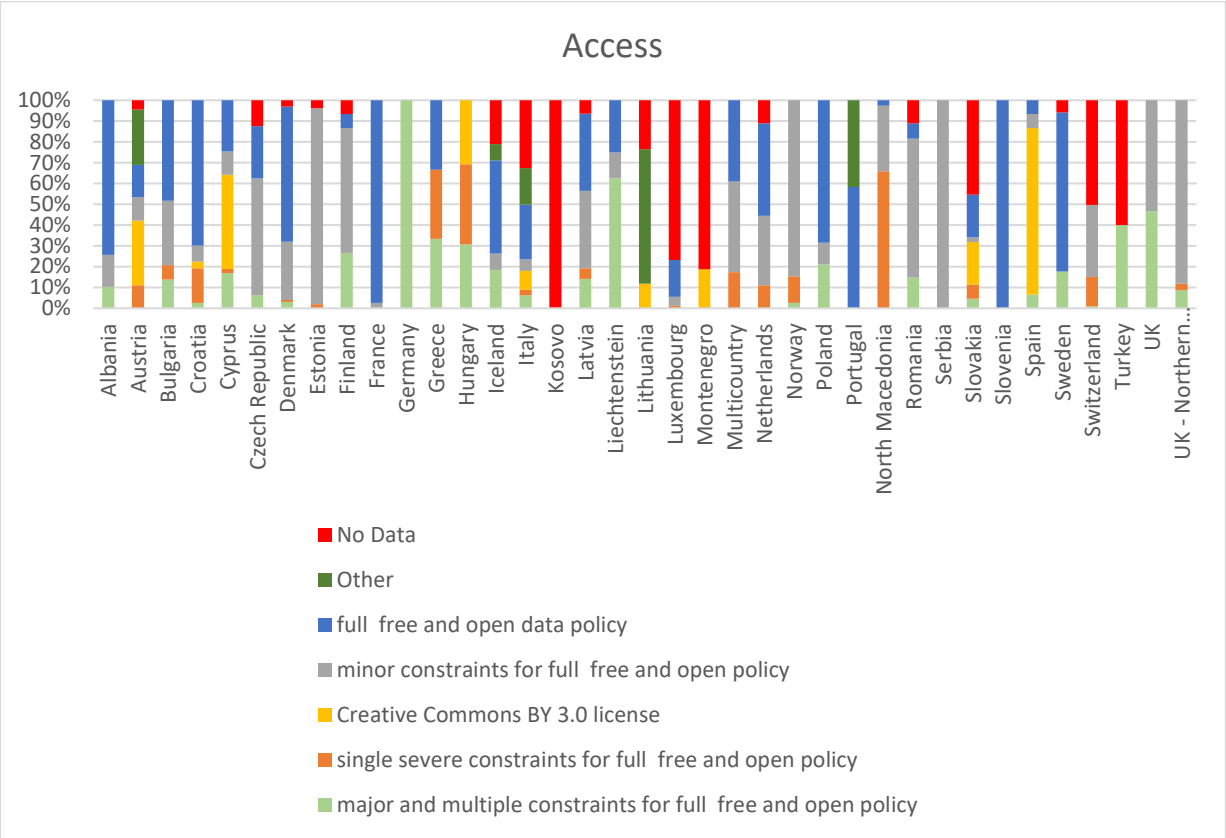

Figure 20. Percentage of MS datasets falling in different "Access" categories.

5.3.2 Costs

Method

The attribute "Data cost" refers to the cost to be made to get access to a particular dataset. If a dataset is free of charge and MS provided information such as "free", "no", "no cost", datasets were assigned to the category "Free". In case when MS provided information about cost in amount of Euros or national currency, datasets were assigned to the category "Not Free". All other types of provided information including links to pricing information were assigned to category "Other". Datasets without any information about the cost belongs to category "No Data".

Assessment

Most of the dataset which contain information about the cost, are free of charge. MS with high proportions of free datasets (>=50%) are Albania, Cyprus, Czech republic, Denmark, Finland, Lithuania, The Netherlands, Norway, Poland, Sweden, United Kingdom and Northern Ireland. All data of Slovenia

and Spain are free of charge. MS with highest rate of paid datasets (10-30%) are Czech Republic, The Netherlands, Poland and United Kingdom. Also, both of datasets provided by Germany are not free of charge. However, Germany mentioned in their report they have more datasets and in case of interest to contact Service Centre of BKG regarding all questions of licensing and fees. Relatively high number (11) of MS did not provide information about any dataset cost including Austria, Estonia, France, Kosovo, Latvia, Liechtenstein, Luxembourg, North Macedonia, Serbia, Switzerland and Turkey.

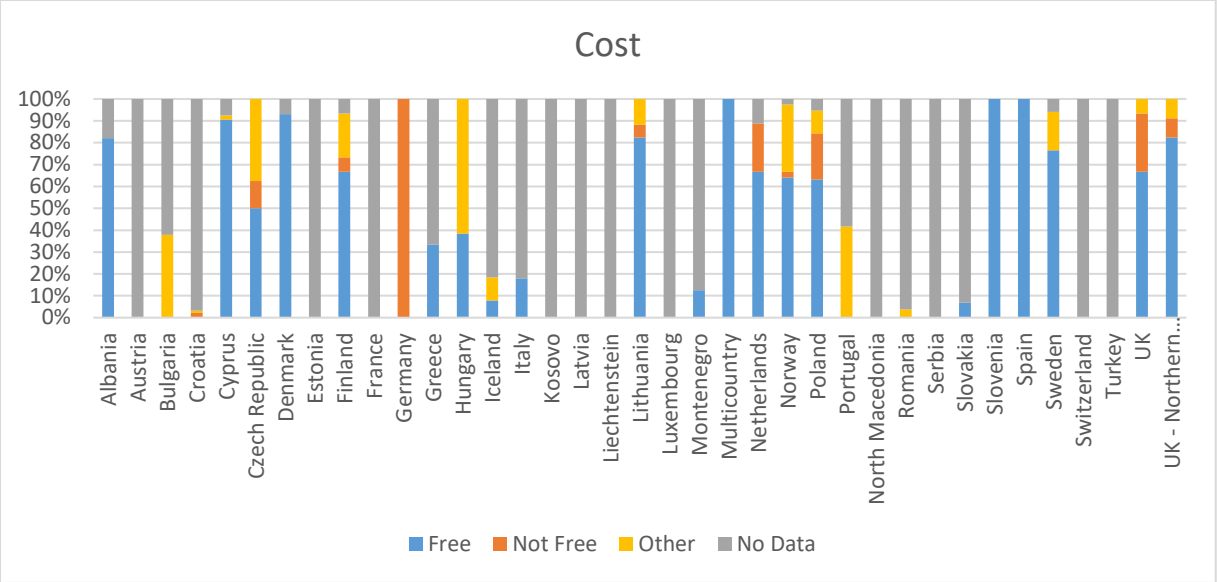

Figure 21. Percentage of MS datasets falling in different "Cost" categories.

5.3.3 Proliferation in CLC instances

Method

Proliferation is meant to indicate that information from a given dataset is allowed to be transferred to a CLC Instance. According to the look up table for the attribute "Proliferation in CLC instances" MS have two options: Yes or No. All other records where MS provided any information, but not explicitly answered with yes or no, were added to the category "Others". "No Data" was assigned when records remained empty.

Assessment

In most of the cases when MS reported information about proliferation, the option "Yes" was filled. In all of those cases it was at least twice more than option "No". MS with prevalence of "No" option are only Estonia and Romania. High proportions of datasets in the category "Other" are Finland, Germany, Greece, Hungary, Poland and Portugal (>=20%). MS with none or less than 10% information on proliferation are Austria, France, Kosovo, Luxembourg, Montenegro and Switzerland.

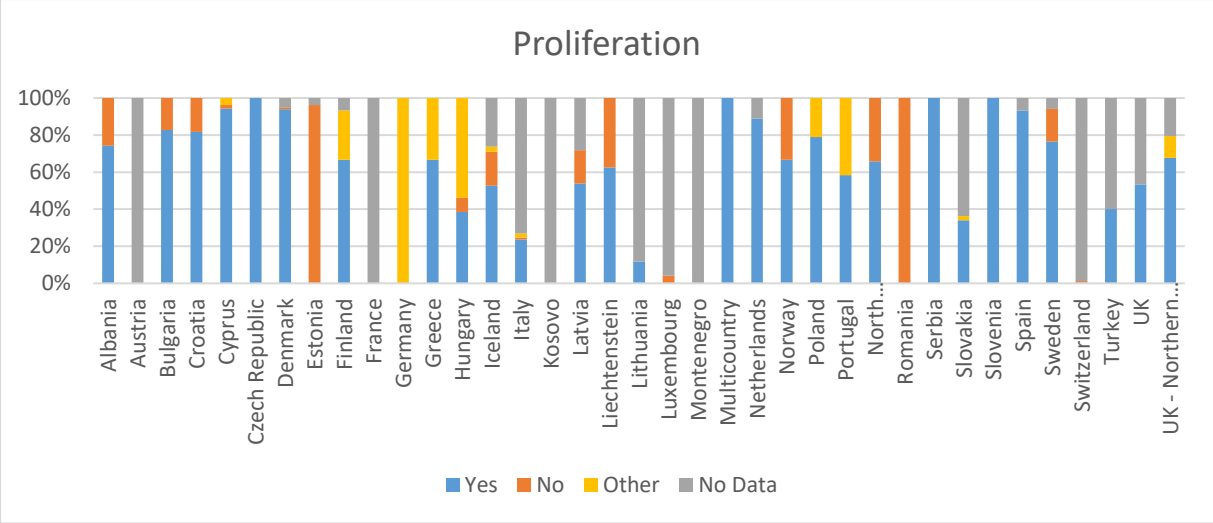

Figure 22. Percentage of MS datasets falling in different "Proliferation in CLC+ instances" categories.

5.3.4 CORDA

Method

The attribute "CORDA" refers to whether the MS provided data related to presence of particular dataset at CORDA data portal. When MS delivered a link to datasets at the CORDA portal, datasets were assigned to category "Available". If records remained empty, datasets were assigned to category "No Data".

Assessment

In summary, MS reported a relatively low number of datasets being available at the CORDA data portal. MS with more than 25% of their datasets on the CORDA portal are Germany, Poland, Serbia, Spain and Turkey. Large number of datasets without information on accessibility in CORDA (category "Other") were present in Bulgaria and Norway. In datasets delivered by Finland, France, Greece, Hungary, Iceland, Kosovo, Liechtenstein, Montenegro, The Netherlands, Portugal, North Macedonia, Romania, Slovakia, Slovenia, Sweden, United Kingdom and Northern Ireland there was no reference to the CORDA data portal.

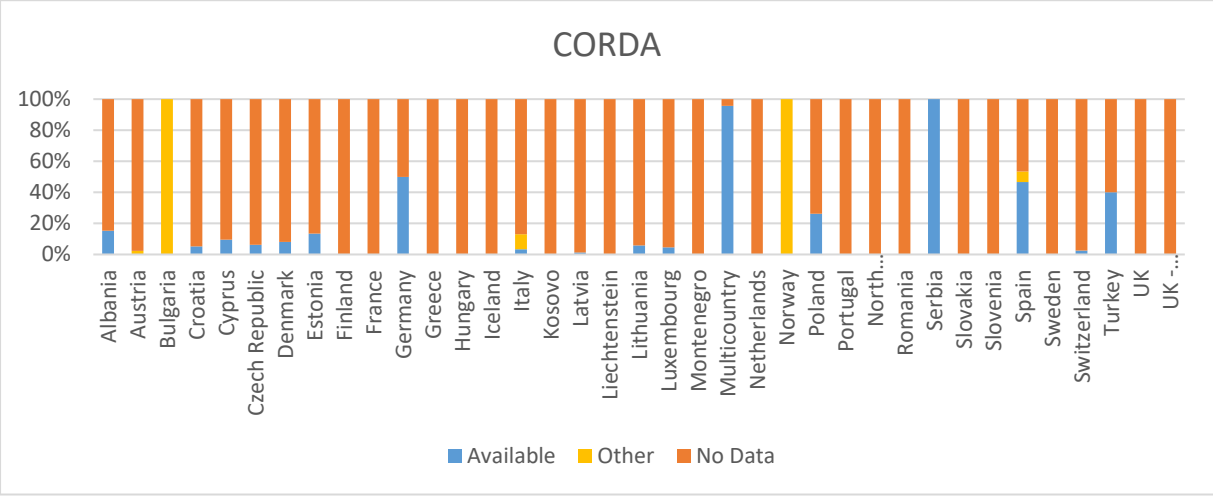

Figure 23. Percentage of MS datasets falling in different "CORDA" categories.

5.3.5 INSPIRE

Method

The attribute “INSPIRE” refers to whether MS provided data related to presence of particular dataset at INSPIRE data portal. When MS delivered a link or unique INSPIRE code, they were assigned to the category “Available”. All other records where MS provided any information, but not confirming it’s presence on INSPIRE data portal, were added to category “Others”. If records remained empty, datasets were assigned to category “No Data”.

Assessment

There is high variation of dataset presence at INSPIRE data portal. MS with high proportions of datasets (>50%) included in the portal are Austria, Croatia, Denmark, Finland, Kosovo, Latvia, Luxembourg, Romania, Spain and Switzerland. Large number of datasets without information on accessibility in INSPIRE (category “Other”) were present in Bulgaria, Estonia, France and Poland. Databases listed by Albania, Germany, Greece, Iceland, Liechtenstein, Montenegro, North Macedonia, Serbia, Slovenia, Turkey, United Kingdom and Northern Ireland do not contain any reference to the INSPIRE data portal.

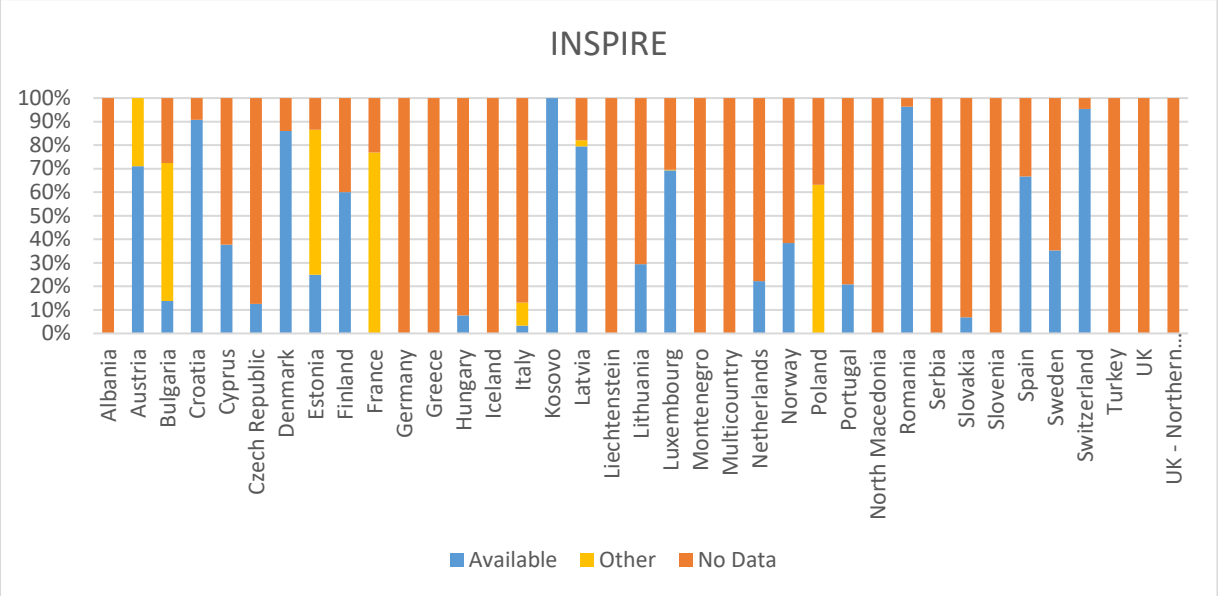

Figure 24. Percentage of MS datasets falling in different “INSPIRE” categories.

6 CONCLUSIONS AND RECOMMENDATIONS

6.1 Assessment of the impact of LUA/LCH availability

6.1.1 CLC+ Legacy instance

None of the MS reported national data available for **all** LUAs/LCHs needed to derive the **CLC+ Legacy instance**. To derive the CLC+ Legacy instance 25 LUAs are needed. The country that comes close to it is Italy[8] with data available for 25 LUAs. In total, 40% of MS have data available for >=80% of the LUAs (i.e. >=20 LUAs) to derive the CLC+ Legacy instance (Albania, Croatia, Czech Republic, Denmark, Finland, France, Iceland, Italy, Montenegro, The Netherlands, Norway, Slovakia and Spain) (see Figure 25). One third of the MS have data available for 40% or less of the LUAs (=<10 LUAs) requested.

The LUAs *Sports infrastructure, Railway network, Nature protection* and *Road network*, which are needed to derive the CLC+ Legacy instance, are available in 26, 27, 28 and 30 MS, respectively. Data on 64% of the LUAs (i.e. 16 LUAs) needed to derive the CLC+ Legacy instance are present in 60% or more of the MS. Data on the other LUAs needed are present in 30-60% of the MS where the most problematic LUAs are *Salines*[9]*, Other recreational services, Financial, professional and information services* and *Logistic storage*.

In total 84% of the LUAs (needed to derive CLC+ Legacy instance) are present in 50% or more of the MS.

To derive the CLC+ Legacy instance 61 LCHs are needed. Seven MS (21% of all MS) reported to have only data available for =< 10 LCHs out of the 61 LCHs, which is 16% or less of LCHs needed to derive the CLC+ Legacy instance: Czech Republic, Estonia, France, Latvia, Liechtenstein, Luxemburg and Switzerland (see Figure 26). Eighteen MS (53% of MS) have data available for 20 or more LCHs (33% or more of total LCHs needed). However, the maximum number of reported LCHs for which data is available in a country is 43 (Italy).

Only a selective group of the following 7 LCHs (out of the 61 LCHs needed to derive the CLC+ Legacy instance) can be provided by more than 60% of the MS: *Constructed, industrial and other artificial, Inland marshes, Inland surface water, Arable Crops, Pastures/meadows, Permanent crops* and *Needle leaved*. Data for all other LCHs are available in less than 60% of the MS.

In total 26% (i.e. 16 LCHs) of the LCHs (needed to derive the CLC+ Legacy instance) are present in 50% or more of the MS.

6.1.2 CLC+ LULUCF instance

Sixteen additional LUAs are needed to derive the **CLC+ LULUCF instance** (see Figure 25)[10]. Only four MS (12% of MS) could provide for 10 or more LUAs information (>=62.5% of total LUAs needed). From

[8] Italy's inventory came up with a lot of regional databases which makes national coverage difficult if not impossible.

[9] Salines are not present/relevant in a lot of MS which makes it understandable that it is reported in only a few MS

[10] Some MS did not report on LUAs for CLC+ LULUCF, as it was not requested by EEA.

the 34 MS 17, which means that 50% of the MS, have data available for less than 5 LCHs (i.e. <30% of total of 16 LUA needed).

Data for LUAs needed to derive the CLC+ LULUCF instance have limited availability in the MS. Only the LUAs *Forestry, Transport networks* and *Urban greenery and parks* (19%) are available in more than 50% of the MS (i.e. 17 or more MS). Ten out of the 16 LUAs are available in less than 26.5% of the MS.

A vast majority of 64% of MS report that they have only data available for less than 5 LCHs (i.e. 21% of 24 LCHs needed) (Figure 26)[11]. Fifteen percent (i.e. 5 MS) report that they have national data for more than 10 out of 24 LCHs needed to derive the CLC+ LULUCF instance (>=42%).

From the 24 LCHs additionally needed to derive the CLC+ LULUCF instance only the *Woodland and forest* LCH is covered by more than 50% of the MS. All other LCHs (96%) are covered by less than 50% of the MS i.e. 17 less than MS.

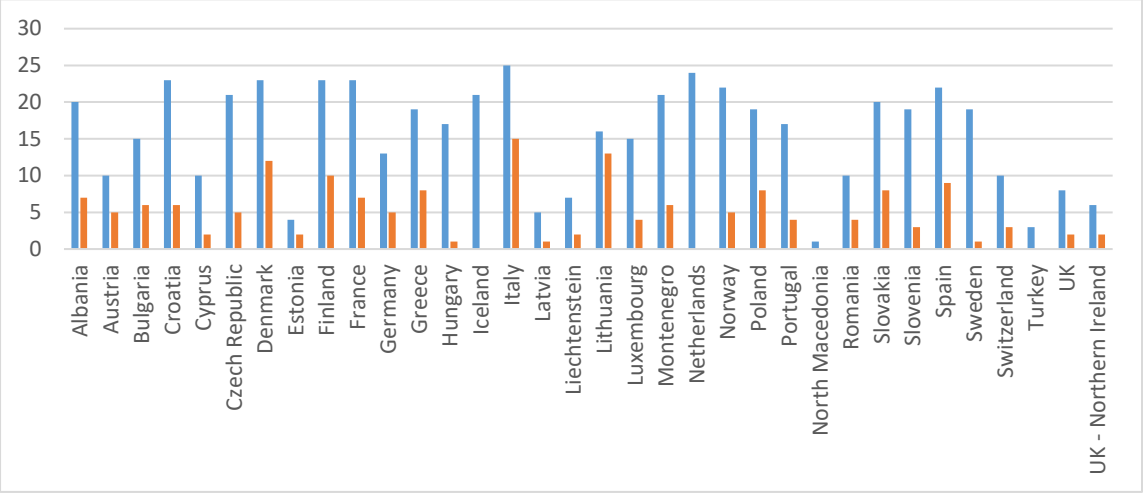

Figure 25. Summary of the total number of LUAs available per MS that are needed to derive CLC+ instances (blue = CLC+ Legacy; orange = CLC+ LULUCF).

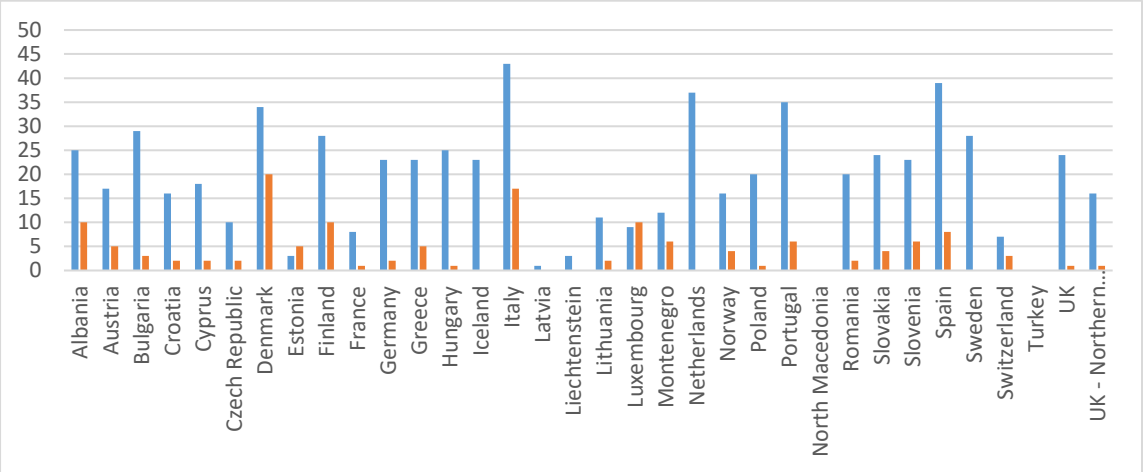

Figure 26. Summary of the total number of LCHs available per MS that are needed to derive CLC+ instances (blue = CLC+ Legacy; orange = CLC+ LULUCF).

[11] Some MS did not report on LCHs and/or most of the MS were not aware of the intentionally hidden columns in the LCH sheet.

6.1.3 Overall impact of MS data availability regarding LUAs/LCHs for CLC+ instances

An assessment on the availability is not straightforward, which is due to several reasons: 1) inhomogeneity of the understanding the request from EEA among MS (i.e. some has followed instructions and filled in fields only for Legacy, while others for all fields), 2) some LCHs fields were hidden in the Excel file sent to the MS, and 3) some additional LUA/LCHs are needed as discovered in previous contract (see section 1.4).

There are more data available at MS level to feed the LUAs needed for the CLC+ Legacy instance than for the CLC+ LULUCF instance. The "lack" of national data to derive the CLC+ LULUCF instance may partly due to the fact that information on this was NOT requested by EEA. However, the difference of 60% of MS having data available for more than 10 LUAs needed to derive the CLC+ Legacy instance compared to the 12% of MS that have data available for 10 or more LUAs needed to derive the CLC+ LULUCF instance makes clear that - unless the incomplete inventory - the data availability in MS for the CLC+ LULUCF instance is less than for the CLC+ Legacy instance.

The data availability for LUAs is better than for LCHs in the MS. In case of the CLC+ Legacy instance, data for 84% of the LUAs is present in majority (more than 50%) of MS, while data for only 26% of LCHs are covered by majority (more than 50%) of MS. Idem for the data availability of LUA/LCHs in MS concerning the CLC+ LULUCF instance. Data is available in more than 50% of MS for 19% of LUAs, while only 4% of the LCHs are covered by more than 50% of the MS. These LUA/LCH percentages concerning the CLC+ LULUCF instance will not rise significantly (from 19 to 31% and from 4 to 8%, respectively) if the MS Hungary, Iceland, The Netherlands and Sweden would have national data that comply with all LUA/LCHs needed to derive the CLC+ LULUCF instance.

6.2 Other issues relevant for applicability of MS data for CLC+ instances

6.2.1 Characteristics of datasets

Temporal extent

75% of the MS reported datasets with reference year before 2015 or not reported any information on the temporal extent of data. When using the data provided by the MS, it should be taken into account that information is often not up-to-date and that temporal resolution is quite variable over Europe.

Language

National language plays most important role in data characteristics since data are in first place used for purposes within the MS. Knowledge of national language is needed to use the datasets.

Coverage

Most datasets have national coverage. In five MS (Austria, Greece, Italy, Republic of Macedonia and Norway) a large proportion of the datasets does not have national coverage. Especially in these MS the number of LUAs/LCHs fed by national data will be far less than the numbers that are provided in the analysis presented in chapters 3 and 4 due to the fact that national coverage for LUAs/LCHs is not possible.

Representation type

Majority of the datasets have as datatype vector. For a larger number of MS (Denmark, Estonia, Iceland, Italy, Kosovo, Latvia, Luxemburg, Serbia, Slovakia and Switzerland) more than 20% of the datasets have no information on the data type.

Minimal mapping unit

For a lot of MS there is no data available on MMU or the MMU is unknown. Only for Germany and Greece the MMU is known for a majority of datasets. More in depth analysis is needed to use the information on MMU for an assessment of the effect of MMU on 1 ha grid cell of CLC+ Core.

Format

Data are stored in a high variety of formats. The most commonly used format is the ESRI shapefile. Only in Finland, Romania and Serbia are none of the datasets provided in shapefiles.

Update frequency

In many MS, such as Albania, Kosovo, Latvia, Luxembourg, Montenegro, North Macedonia, Serbia, Switzerland, Turkey and Northern Ireland the update frequency is reported for only a limited number of datasets (<10% of datasets), which means for >=90% of datasets no data on update frequency is provided. Also, a lot of MS have large proportions of their datasets that cannot be attributed to the categories > 1year or < 1year (category " Other"). A better guidance in the form of a look up table provided with the request could have overcome a lot of unclarities.

Spatial resolution

For Albania, France, Kosovo, Luxembourg, Montenegro, Serbia, Slovakia and Northern Ireland =<20% of their datasets have information on spatial resolution. Also in other MS lots of datasets do not have any information on spatial resolution which is an issue to be viewed in detail if the data will be aggregated to 1 ha grid of CLC+ Core.

6.2.2 Access conditions

Access

Germany and Liechtenstein have 100% and 60%, respectively of their datasets with major and multiple constraints for full free and open policy. Also the MS Finland, Greece, Hungary, Poland, Turkey and United Kingdom have relatively large part (20-50%) of their datasets with such constraints. Single severe constraints for full free and open policy is characteristic mainly for datasets from Croatia, Greece, Hungary, The Netherlands, Norway and Switzerland, however with lower but not insignificant rates between 10-40%. The Republic of North Macedonia reaches a proportion of 65% of their datasets with such constraints. The access to the data of these MS will be challenging.

Costs

Concerning the cost, one group of MS have large amount of data available free of charge and a very large group of MS does not have any information or a high proportion of datasets for which no information is available. Germany is the exception with no data available for free.

Proliferation in CLC instances

A lot of the datasets MS reported fall within the categories "No data" or "Other" for this attribute which means MS do not know or did not understand the attribute. A better description of this attribute would help to guide MS to provide relevant information concerning this attribute.

CORDA

The majority of national data needed to derive CLC+ instances cannot be found at the CORDA portal. Exceptions to a certain extent are Germany, Poland, Serbia, Spain and Turkey.

INSPIRE

A similar situation applies to data available via the INSPIRE portal. Only a few MS reported relevant INSPIRE datasets as e.g. Austria, Croatia, Denmark, Finland, Kosovo, Latvia, Luxembourg, Romania, Spain and Switzerland. Compared to CORDA more national data are listed at the INSPIRE portal.

6.2.3 Summary per MS

The datasets provided by **Albania** are in proportion relatively recent – mostly not older than 2015. Remarkably high proportion of datasets is in raster representation type and provided through WMS/WFS services. High number of dataset is available with full free and open data policy.

The datasets from **Austria** are characterised by relatively high proportion of datasets available at INSPIRE portal (70%). Almost all datasets are provided in national language and also high proportion of regional datasets is presented. In terms of access conditions, Austria has quite high number of datasets using Creative Commons BY 3.0 license.

Relatively high proportion of datasets provided by **Bulgaria** is in English language. More than 70% of datasets are from last 5 years. High proportion of datasets listed by Bulgaria (~50%) is also characterised by full free and open data policy.

Croatia provided highest number of datasets from all countries (468), however datasets were derived from only 248 datasets and some were subdivided by thematic focus (classes of dataset). Almost all datasets are in national language. Relatively large portion of datasets (70%) has full free and open data policy.

Relatively high proportion (almost 80%) of datasets from **Cyprus** is from last 5 years. Cyprus has also remarkably high proportion of datasets free of charge (90%). More than 60% of datasets is provided in English language. Also, Cyprus is among the countries with some of datasets characteristic by large MMU.

All dataset listed by **Czech Republic** are in vector representation type. Relatively high proportion (~20%) of datasets are characterised by update of more than 1 year. In terms of access conditions, Czech Republic has quite high number of datasets (~50%) with minor constraints for full free and open policy.

More than 90% datasets listed by **Denmark** are free of charge. Relatively high proportion (>90%) is included in INSPIRE data portal. Denmark has also high rate of datasets provided in GML format (~30%).

All datasets provided by **Estonia** are in national language. Almost 70% of datasets has unknown representation type. More than 90% of dataset has minor constraints for full free and open policy. Data about the cost of datasets were not provided. Estonia has also in almost all datasets no proliferation in CLC instances. Information about MMU was not provided,

Finland is among the countries with highest rate of datasets (~55%) being updated within 1 year. Availability of free datasets is also relatively high (~55%).

Almost all datasets from **France** are provided with full free and open data policy. More than 90% of datasets has no information about temporal extent and MMU. Data about cost and proliferation in CLC instances were not provided.

Germany provided only 2 datasets within Resource description database. Both datasets are provided in national language and have major and multiple constraints for full free and open policy. Datasets have small MMU and large map scale.

All three provided datasets from **Greece** are in national language. Two datasets have local coverage. All datasets have vector representation type and are provided in small map scale. MMU is also small in all datasets.

Hungary is characterised by relatively high rate of datasets (>40%) being in both national and English language. High proportion of datasets are provided in high resolution – among the countries which provided information in pixel size. Hungary has also highest proportion of datasets being updated in more than 1 year.

Iceland has the highest rate (80%) of datasets provided in both national and English language. In most datasets the information about temporal extent and update frequency is not known. Relatively high proportion (>40%) of dataset are provided with full free and open data policy.

Italy has the highest proportion of regional datasets (~98%). Datasets have all 5 types of access conditions as defined in lookup table. More than half of datasets did not have any information about temporal extent.

From the attributes used in this overview **Kosovo** provided information only for the following: temporal reference, coverage, format and INSPIRE locator. All datasets are provided in shapefile data format, are relatively recent (within last 5 years) and have mostly national coverage.

Almost 70 % of datasets from **Latvia** are relatively recent (not older than 2015). Availability of datasets on INSPIRE portal is relatively high (80%). Large proportion of datasets has no information about the representation type. Information about MMU and update frequency is missing for all datasets.

All datasets from **Liechtenstein** are provided in national language. Around 90% of datasets are provided in vector representation type and shapefile format. In terms of access conditions, Liechtenstein has relatively high proportion of datasets with major and multiple constraints for full free and open policy.

Lithuania listed relatively high number of datasets (~80%) which are older than 2015. More than 80% of datasets are free of charge and more than 90% of dataset are provided in large scale.

Almost 80 % of datasets from **Luxembourg** were produced within last 5 years. There is only limited information about update frequency and proliferation in CLC instances (<10%) and no information about data cost and MMU.

All datasets from **Montenegro** are provided in vector representation type and shapefile format. Information about update frequency, spatial resolution, MMU and proliferation in CLC instances is missing.

Almost 80% datasets from **The Netherlands** are relatively recent (produced after 2015) and a large proportion (~55%) is updated within 1 year. Based on availability of information about the cost, Netherlands has relatively high proportion of free datasets (almost 70%). However, the proportion of datasets which are not free of charge is also relatively high among the countries which provided cost information.

All datasets from **Norway** are provided in national language. Around half of datasets has local coverage. Vector representation type is used for all datasets. In terms of access conditions, Norway has relatively high proportion of datasets (~85%) with minor constraints for full free and open policy.

Large part of datasets from **Poland** (~75%) is provided with full free and open data policy. Almost 30% of datasets is available at CORDA portal. Information about temporal extent is in missing in Poland's database.

Relatively high proportion of datasets from **Portugal** (>60%) is characterised by an update frequency within 1 year. Temporal extent of large part of datasets (~85%) is within last 5 years. About 20% of datasets is provided through WMS/WFS services.

The datasets from **North Macedonia** are characterised by relative high proportion of datasets (55%) older than 2015. Proportion of datasets in both national language and English is highest among all countries (~80%). North Macedonia has also highest proportion of datasets with single severe constraints for full free and open policy (~65%).

Around 65 % of datasets from **Romania** has minor constraints for full free and open policy. Romania is the only country which not provided information about data format.

Serbia provided only one resource dataset. Missing information is in the attributes: update frequency, representation type, spatial resolution, MMU, data cost and INSPIRE.

In 30 % of datasets from **Slovakia** is not any information filled for each of attributes and only names of datasets were provided. All of remaining datasets are in national language. High proportion of datasets is provided with Creative Commons BY 3.0 license. Information about temporal extent is in database of Slovakia missing.

Almost half of datasets from **Sloveni**a is older than 2015. All datasets are provided in national language and free of charge. Reference to CORDA and INSPIRE is within list of datasets of Slovenia missing.

Relatively high proportion of datasets from **Spain** (~65%) is characterised by an update frequency within 1 year. In terms of access conditions, Spain has highest proportion of datasets using Creative Commons BY 3.0 license (~90%). All dataset can be used free of charge.

More than 80 % of datasets from **Sweden** has full free and open data policy. Relatively high proportion of datasets is available in high resolution (~25%) and free of charge (~80%).

More than 95% of datasets from **Switzerland** is available on the INSPIRE data portal. All datasets are provided in national language. There is no information available about the data cost, update frequency and proliferation in CLC instances.

All datasets from **Turkey** are available in national language and raster representation type. All datasets are available for full coverage of the country.

Datasets from **United Kingdom (Great Britain)** have relatively equal proportion (~18%) of datasets being updated within 1 year and more than 1 year. In terms of access conditions, United Kingdom has quite high number of datasets with minor constraints for full free and open policy. United Kingdom has relatively high rate of paid datasets (~25%).

Northern Ireland has highest proportion of datasets (~75%) older than 2015 among all countries. Highest proportion of datasets was reported also for tabular representation type (~30%). In terms of access conditions, Northern Ireland has relatively high number of datasets with minor constraints for full free and open policy (~90%).

6.3 Improvements and limitations of current MS inventory

Based on the results of the present MS inventory:

- Further effort is required to provide sufficient information regarding data needed for CLC+ Legacy instance;
- Results are insufficient to deliver a meaningful overview on the available datasets of European Member States to serve a future CLC+ LULUCF instance.

The requirement to collect data on the information needed for the CLC+ LULUCF instance came after publishing the MS survey, thus replies are incomplete regarding this topic. Additionally, the evaluation of the EEA survey revealed that MS had different interpretation regarding the information requested by the EEA. Therefore some MS provided inhomogeneous information on their national data and thus requires more effort for a meaningful assessment of the possible national contributions to a European CLC+ database. To complete the picture of the data situation it is strongly recommended that EEA extends the survey to receive the missing information on LULUCF and to clarify ambiguous and vague replies of the MS. This may be carried out by either an additional request to all MS or bilateral communications with the MS where information is partly missing.

A follow up request to the MS should take into account the following recommendations:

1. Clear explanation on the LUAs/LCHs needed from the MS
    a. The EEA inquiry requested information on LUA/LCHs related only to CLC+ Legacy (marked in green in the Excel file) but not on the CLC+ LULULCF instance. Due to this issue some MS, which followed strictly the EEA request provides information only on LUA/LCHs related to the CLC+ Legacy instance, probably resulting in an underestimation of data available for the CLC+ LULUCF instance in these MS.
    b. The list of LUAs/LCHs important for the derivation of the CLC+ Legacy instance has been revised after the publishing of inquiry, and a need to add further elements to the request to the MS has been discovered. For those LUAs/LCHs not all MS provide information as they focus only on the ones marked as mandatory for the derivation of CLC+ Legacy.
2. Better elaboration of the Excel file
    a. The definition of the different attributes requested should be formulated in a more understandable way. For example the meaning of the attribute “Relevant field” was unclear to many MS.
    b. Some/Many LCHs needed for the CLC+ LULUCF instance were in intentionally hidden columns of the Excel table, to make the table better readable. Only the Bilbomatica inventory took those columns into account, i.e. only those MS examined that way have relevant results for those “hidden” LCHs. The other MS did not consider these LCHs, leading to an incomplete overview on national data availability for the CLC+ LULUCF instance.
    c. The check on the availability of a specific LUA/LCH should not only provide a choice between 0 or 1 in the survey, but ask as well if the LUA/LCHs is relevant/applicable in the MS. In the current form of the table it is not clear from an empty field if data does not exist for specific LUA/LCH, if the LUA/LCH is not relevant or if the MS just did not fill it.
    d. A highly-valuable option for the inventory of LUAs/LCHs would be the indication per LUA/LCHs whether it can be taken 1:1 from the MS database or that it should be

queried or processed from a combination of MS datasets (as indicated by e.g. France, Hungary, The Netherlands, Norway and Spain).

e. For the analysis of the resource description it would be helpful to have a better description of the different options to describe the characteristic/attribute. Each attribute should preferably have a predefined look-up table to standardise and ensure consistency of inputs from MS
f. Datasets in the resource description should be numbered and these numbers should be used in the resource title field per LUA/LCHs which makes later analysis more straightforward.
g. Data needs for level 0. Some data was requested for CLC+ Legacy at level 0 (Industries and Residential) but for MS it was not possible to enter any input at that level 0. This needs to be corrected, as these two fields are very important input information for the CLC+ Legacy instance.
h. Other possible improvements regarding the resource description could be 1. to add a field in the resource description where it is possible to note down all LUAs/LCs that can be derived from the specific dataset to analyse the richness of the dataset, 2. datasets should be numbered and those numbers should be used in the LUA/LCHs worksheets of the Excel file and/or 3. subdivision of datasets based on classes should be avoided.

3. Harmonisation between the MS inventory and Bilbomatica.
    a. The inventory of Bilbomatica did take into account a level 0. Most of the other MS not involved in the Bilbomatic inventory did not enter information for level 0 (see under 2). This needs to be corrected.
    b. The structure of the Access database would be useful to be applied for all MS. A relation between the datasets in the resource description and the resource titles in the LUA and LCHs sheets as in the Biblomatica Access database would support the analysis of the MS inventories. For example, it would help to assess how many times a MS dataset is used to deliver information on LUAs/LCHs
    c. The interpretation by Bilbomatica for the “Relevant field” attribute was complete different from that of the MS, making it difficult to get information on which attribute of the dataset is relevant for the LUA/LCH. Bilbomatica did put a data theme in this field while it was meant to put the relevant attribute of the national dataset supposed to comply with the LUA/LCH.
4. The number and definitions of the EAGLE LUAs/LCCs/LCHs need to be conformant in the EEA survey and the EEA EAGLE website. The website should be up-to-date with latest revisions in number and definitions of LUAs/LCHs.

6.4 Recommendations and possible future activities

6.4.1 Objections and recommendations

A short summary of objections or thresholds for using national data for feeding into the CLC+ Core for the later derivation of the CLC+ Legacy and CLC+ LULUCF instances.

CLC+ Legacy

Although the data availability within MS to derive the CLC+ Legacy instance is more promising than for CLC+ LULUCF instance, there are still several challenges.

- Limited availability of LCH in MS compared to LUAs
- Additional inventory of the LUAs (level 0 and others) that were not taken up in EEA's request, but appeared to be important to derive the CLC+ Legacy instance

CLC+ LULUCF

EEA has requested information only LUAs/LCHs needed for CLC+ Legacy. For this reason the inventory should be extended for CLC+ LULUCF to get a better overview on the availability of national data. them). Other challenges for the CLC+ LULUCF instance are:

- Data availability in the MS that were not participating in the Bilbomatica survey for LCHs needed to derive CLC+ LULUCF. A number of LCHs were not taken into account by those MS as the LCHs were intentionally hidden in the Excel file
- Additional inventory of the LUAs (level 0 and others) that were not taken up in EEA's request but appeared to be important to derive the CLC+ LULUCF instance
- Overview of data availability for LUA/LCHs in at least Hungary, Iceland, The Netherlands and Sweden is not known as the LULUCF priority came later than the moment when MS had been contracted. Not all countries delivered information for all LUA/LCHs or the ones needed for CLC+ LULUCF instance. So these countries seem to be less data rich and less „diligent", but their inventories did not take these other LUAs/LCHs into account.

Overall

The following list of issues to be taken into account for implementing CLC+ Core are of more general nature:

- Some datasets listed by MS do not have national coverage, which is especially the case in Austria, Greece, Italy, Republic of Macedonia and Norway
- Datasets are in most cases in national language making it obligatory to use national experts to derive the LUAs/LCHs
- Next to the language problem, LUAs/LCHs in some MS only can be derived by querying or combining different national datasets
- Harmonisation of LUAs/LCHs between MS due to different thematic definitions, temporal extent and spatial resolution (standardise and ensure consistency)
- Many MS have datasets that are difficult to access due to restrictions for use or data costs which should be further analysed to be able to assess CLC+ feasibility
- No national interest of 12 MS (for which the inventory was done by Bilbomatica), which makes it difficult to get more information on quality and access to the datasets mentioned
- Misunderstanding or incomplete information regarding the LUA/LCHs relevant field description (i.e. the relevant attribute of the national dataset that match with the LUA/LCH as described by EAGLE)

The following table 4 gives an overview of the different challenges and the accompanying recommendations.

Table 4. Overview of challenges and recommendations.

- Issue	- Recommendation
- A limited number of MS can provide the majority of LUAs and LCHs needed to derive the CLC+ Legacy instance	- Carry out a detailed analysis of missing data per country - Contact MS at 1:1 basis to close specific gaps - Request the four MS concerned to complete the information on the later added needed LUAs - Analyse optional methods for data collection (Task 1 of the current contract)
- Information on data availability for CLC+ LULUCF instance is incomplete	- Request the four MS concerned to complete the information - Ask the "non-Bilbomatica" MS to provide information for hidden LCHs
- Datasets are in most cases in national language making it obligatory to use national experts to derive the LUAs/LCHs	- Contract a MS or private company to provide lookup table for translation
- Results of the survey are in some issues incomplete, ambiguous or not comparable among MS	- Improve survey format and description - Complete information on data availability by an extension of survey or by direct consultation with the MS
- Combining or querying of national data to match LUA/LCHs as described by EAGLE	- Contact MS at 1:1 basis to get insight of database structure and queries
- Access conditions and/or proliferation in CLC+ instances limited or unknown	- Contact MS to explain the attributes and look for possibilities to get access for indispensable datasets
- Misunderstanding of the attribute "Relevant filed in the EEA" request	- Contact MS to explain the attribute and get the information needed on the attribute that matches with the LUA/LCHs as described by EAGLE
- Datasets without national coverage	- Investigate the possibility to replace the regional datasets by national datasets
- Availability (yes/no) of national data and/or relevance for LUA/LCHs is not always indicated	- Contact MS to indicate in their inventories if LUA/LCHs are not relevant for the MS. No empty check boxes.
- Inventory by Bilbomatica deviates slightly from the other MS	- Information of the MS should be checked/extended by the MS concerned (quality of datasets, relevant attributes/fields)

6.4.2 Possible future activities

Additional analyses may be needed on the following:

1. An assessment on the number of LCH/LUAs covered per datasets (only CLC+ LULUCF and Legacy instances).

2. Further information to be collected from the MS that indicate that more than one dataset is covering specific LUAs/LCHs. And how eventually datasets are combined /queried to derive LUA/LCHs.

3. Information coming from **updated** MS inventories like France and Italy should be included in the overall assessment. Also inventories delivered after January 24th, 2020 by MS should still be included in the assessment (e.g. Ireland).

4. Summary per country concerning availability of LUAs/LCHs to facilitate the assessment at MS level. Figures showing spatially the differences between MS regarding important findings could be of help.

5. Assessment of data completeness per LUA/LCH in order to identify most important data gaps (Task 1 of current contract).

The approach to derive CLC+ instances at EU scale from LUAs/LCHs based on only MS data is first of all limited by data availability from the MS. Within Europe there is a high diversity concerning data availability and data quality. New methods, future technologies and/or new data sources can provide solutions in the future. The success to derive CLC+ instances is largely dependent on cooperation and joint effort of Copernicus, Member States and industry. Most of land use information cannot be derived using EO technologies only, thus the involvement of Member State institutions and experts is crucial in both the use of existing datasets in deriving CLC+ Instances and in the derivation of new data in order to fulfil data gaps.

7 ANNEXES

7.1 Presence Land Use Attributes per MS (level 1-4)

Level 1

		Albania	Austria	Bulgari	Croatia	Cyprus	Czech R	Denma	Estonia	Finland	France	Germa	Greece	Hungar	Iceland	Italy	Latvia	Liechte	Lithuar	Luxem	Monte	Nether	Norwa	Poland	Portug	North M	Roman	Slovaki	Sloven	Spain	Swede	Switzer	Turkey	UK	UK - Northern I	
Level 0	Level 1	AL	AT	BG	HR	CY	CZ	DK	EE	FI	FR	DE	GK	HU	IS	IT	LV	LI	LT	LU	ME	NL	NO	PL	PT	MK	RO	SK	SI	ES	SE	CH	TR	JK or GE	NI	Total
Primary Pr	Agriculture	1	1		1	0	1	1	1	1	1	0	1			1	1		1	1	1		1	1	1	0	1	0	1	1		1	0			21
	Forestry	1	1	1	1	1	1	1	0	1	1	1	1			1	0	1	1	1	1		1	1	1	0	1	1	1	1		0	0			23
	Mining and Quarrying extraction sites	1	1	1	1	1	1	1	1	1	1	1	1			1	0	1	1	1	1		1	1	1	0	1	1	1	1		1	0			25
	Aquaculture and Fishing	0	0		1	0	0	1	0	0	1	0	0			1	1	0	0	0	1		1	0	1	0	1	0	0	0		0	0			9
	Other Primary Production	1	0		0	1	0	1	0	1	1	0	0				0			0	0		1	0	0	0		0	1	0		1	0			8
Industries	Manufacturing / producing industry	1	0		1	0	1	1	0	1	1	0	1	1	1	1	0	1	1	0	1	1	1	1	0	0	1	1	1	1	1	1	0			22
	Energy production	1	1		1	0	1	1	0	1	1	1	1	1	1	1	0	0	1	0	1	1	1	1	1	0	1	0	1	1	1	1	0			23
Services ('	Commercial Services	1	0		1	0	1	1	0	1	1	0	1	1	1	1	0			0	1	1	1	1	1	0		1	1	1	0	0	0			18
	Financial, Professional and Information Se	1	0		1	0	1	0	0	1	1	0	1	0	1	1	0			0	1	1	1	0	0	0		1	0	1	0	0	0			13
	Accommodation and Food Services	1	0	1	1	0	1	1	0	1	1	0	1	0	1	1	0			0	1	1	1	1	0	0		1	1	1	0	0	0			17
	Comunity Services	1	0	1	1	0	1	1	0	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	0		1	1	1	1	0	0			24
	Cultural, Entertainment and Recreational	1	0		1	1	1	1	0	1	1		1	0	1	1	1		1	1	1	1	1	1	1	0	1	1	1	1		1	0			23
Transport	Transport networks	1	1		1	0	1	1	1	1	1	0	1			1	1		1	0	1		1	1	1	0	1	1	1	1		1	0			21
	Logistics and Storage	0	0	1	1	0	1	1	0	1		0	1	0	0	1	0		1	0	1	1	1	1	0	0		0	1	1	1	1	0			16
	Utilities	1	0		1	1	1	1	0	1	1	0	1	0	1	1	1	1	1	1	1	1	1	1	1	0		0	1	1	1	0	0			22
Residentia	permanent residential	1	1	1	1	1	0	1	0	1	1	1	1	1	1	1	0	1	1	1	1	1	1	0	0	0	1	1	1	1	1	0	1			25
	Residential Use with Other Compatible Us	1	0	1	1	1	0	1	1	0	1	1	0	1	1	1	0		1	1	1	1	1	0	0	0		1	1	1	1	0	1			21
	other residential	1	0	1	1	1	1	1	0	1	1	1	0	1	1	1	0			1	1	1	1	1	0	0		1	0	0	1	0	1			20
Other Use	nature protection	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1		1	0	1	1	1	1	1	1	1	0	1	1	1	0		1	28
	flood protection	0	1		1	1	1	1	0	0	1	1	0			1	0			0	0		0	0	0	0	1	1	0	1		0	0			11
	renaturation	0	0		0	0	0	1	0	0	1	0	0			1	0			0	1		0	0	0	0		0	0	0		0	0			4
	abandoned	0	0		0	0	1	0	0	0	1	0	0			1	0		1	0	0		0	0	0	0		1	0	0		0	0			5
	no economic use	0	0		0	0	0	0	0	0	1	0	0			1	0			0	1		0	0	0	0		0	0	0		0	0			3
Inland Wa	drinking water	1	0	1	1	0	0	1	1	0	1	1	0			1	0		1	1	1		0	0	0	0	1	1	1	0		0	0			14
	irrigation	1	0		1	0	0	1	0	0	0	0	0			1	0		1	0	1		0	0	0	0		1	1	0		0	0			8
	fire-fighting	0	0		0	0	0	0	0	0	1	0	0			1	0		1	0	0		0	0	0	0		1	1	0		0	0			5
	artificial snow	0	0		0	0	0	0	0	0	0	0	0				0			0	0		0	0	0	0		1	0	0		0	0			1
	water retention	1	1		1	0	0	1	1	0	1	0	0			1	0			0	0		0	0	0	0	1	1	1	1		0	0			11
	nature protection	0		1	1	0	0	1	0	0	1	0	0				0			1	0		0	1	0	0	1	1	0	0		1	0			9
	no economic use	1	0		1	0	0	1	0	0	0	0	0			1	0			0	0		0	0	0	0		0	0	0		0	0			4
Totals		21	9	11	24	10	17	25	6	17	26	9	15	8	12	27	7	7	16	12	21	13	19	15	11	1	14	21	19	18	9	10	3	0	1	454
Only green		12	3	7	13	6	11	12	1	12	12	5	11	8	12	13	4	5	8	7	12	13	13	10	6	1	5	10	10	12	9	5	3	0	1	
LULUCF		3	2	2	4	1	2	4	1	2	4	1	2	0	0	4	1	1	2	2	3	0	2	3	2	0	3	3	2	2	0	2	0	0	0	

Level 2

		Albania	Austria	Bulgari	Croatia	Cyprus	Czech R	Denma	Estonia	Finland	France	Germa	Greece	Hungar	Iceland	Italy	Latvia	Liechte	Lithuar	Luxem	Monte	Nether	Norwa	Poland	Portug	North M	Roman	Slovaki	Sloven	Spain	Swede	Switze	Turkey	UK	UK - Northern I	
	Level 2	AL	AT	BG	HR	CY	CZ	DK	EE	FI	FR	DE	GK	HU	IS	IT	LV	LI	LT	LU	ME	NL	NO	PL	PT	MK	RO	SK	SI	ES	SE	CH	TR	JK or GE	NI	Total
	Commercial Crop Production	1	0		0	0	0	1	0	1	1	1	1			1	0	1	1	0	0		1	0	0	0		1	1	1	1	0	0	1	1	16
	Farming Infrastructure	0	1	1	0	0	0	1	0	1	1	0	0	1	1	1	0	0	1	1	1	1	1	1	1	0	1	0	1	0	1	1	0			19
	Production for own consumption	1	0	1	0	0	0	1	0	1		1	0			1	0	0	1	1	1		0	0	0	0		0	0			0	0			9
	short rotation	0	0		0	0	0	0	0	0		0	0			1	0	0	1	0	0		0	1	0	0		1	0			0	0			4
	intermediate / long rotation	0	0		0	0	0	0	0	0		0	0			1	0	0	1	0	0		1	1	0	0		1	0			0	0			5
	continuous cover	1	1	1	0	1	0	0	0	0		0	1			1	0	0	1	0	0		0	1	0	0	1	1	0			0	0			10
	surface mining	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	0	0	1	0	1	1	1	1	1	0	1	1	0	1	1	1	0	1	1	27
	underground mining	1	0	1	0	0	1	1	0	1	1	1	1				0	0		0	0		0	1	1	0	1	1	0	1		1	0	1	1	16
	under water mining	1	0	1	0	0	0	1	0	0	1	0	0			1	0	0		0	0	1	0	0	0	0		0	0	0		0	0			6
	salines	1	0	1	1	1	0	0	0	0	1	0	1	NR	0	1	0	0	0	0	0	NR	0	0	1	0		0	1	1		0	0			10
	aquaculture	0	0	1	1	1	0	1	0	0	1	0	0			1	0	0		0	0		1	0	1	0	1	1	0	1		0	0			11
	professional wild fishery	0	0		0	0	0	0	0	0	1	0	0				0	0		0	0		1	0	0	0		0	0	0		0	0			2
	amateur fishing	0	1		0	0	0	1	0	0	0	0	0				0	0		0	1		0	0	0	0		1	0	0		0	0			4
	hunting	0	0		0	1	1	1	0	0	0	0	0				0	0		0	0		0	0	0	0		1	0			1	0			5
	migratory animals	0	0		0	0	0	1	0	1	1	0	0				0	0		0	0		1	0	0	0		1	0			1	0			6
	apiculture (bee hives)	0	0		0	0	1	1	0	0	0	0	0			1	0			0	0		0	0	0	0	1	1	1			0	0			6
	picking natural products	0	0		0	0	0	1	0	0	0	0	0				0	0		0	0		0	0	0	0		0	0			0	0			1
	raw industry	0	0		0	0	1	1	0	1	1	0	0			1	0	0		0	0		0	1	0	0		1	0	1		0	0	1		9
	heavy industry	0	0		0	0	1	1	0	1	1	0	0			1	0	0		0	0		0	1	0	0	1	1	0	1		0	0			9
	light industry	1	0		0	0	1	1	0	1	1	0	0			1	0	0		0	1		0	1	0	0		1	0	1		0	0			10
	nuclear power	0	0		0	0	1	0	0	0	1	1	0				0	0		0	0		0	1	0	0	1	1	1	1		0	0			8
	renewable energy production	1	0		1	0	1	1	0	1	1	0	1			1	0	0	1	0	1		1	1	1	0		1	1			1	0	1	1	18
	combustion power plant	0	0	1	1	0	1	1	0	0	1	1	1				0	0	1	0	1		0	1	1	0	1	1	0			0	0			13
	energy distribution facilities	1	0		1	0	1	1	0	0	1	1	1			1	0	0	1	0	1		1	1	0	0		1	1			0	0			14
	Public Admin, Defense, Military, Security	1	1	1	1	0	1	1	0	1	1	1	1			1	1		1	1	1		1	1	0	0		1	1	1	1	0	0	1		22
	Science, Research, Education	1	1	1	1	0	1	1	0	1	1	1	1			1	0		1	0	1		1	1	0	0		1	1	1	1	0	0	1	1	21
	Health and Social Services	1	1	1	1	0	1	1	0	1	1	1	1			1	0		1	0	1		1	1	0	0		1	1	1	1	0	0	1	1	21
	Religious Services	1	0	1	1	0	1	1	0	1	1	0	1			1	0		1	1	1		1	1	1	0		1	1	1	1	0	0			19
	other community services	1	0	1	0	0	1	1	0	0	1	0	0			1	0			0	1		1	0	0	0			1	1		0	0			10
	Cultural services	1	0		1	0	1	1	0	1	1	1	1			1	1		1	1	1		1	1	1	0			1	1		0	0			18
	Entertainment	0	0		1	0	1	1	0	1	1	1	0				0			1	1		1	0	0	0		1	1	1		0	0			12
	Sports Infrastructure	1	1		1	0	1	1	0	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	0		1	1	1	1	0	0	1	1	26
	Open Air Recreational Areas	0	0		1	1	1	1	0	1	1	0	1	0	1	1	0			0	1	1	1	0	1	0		1	0	1	1	1	0	1		18
	Other Recreational Services	0	0		0	1	1	1	0	1		0	0	0	0	1	0			1	1	1	0	0	0	0		1	0	0	1	0	0			10
	road network (incl. parking lots)	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0		1	1	1	1	1	0	1	1	30
	railway network	1	1		1	0	1	1	1	1	1	1	1	1	0	1	0		1	1	1	1	1	1	1	0	1	1	1	1	1	1	0	1	1	27
	air transport	0	0	1	1	0	1	1	0	1	1	1	1	1	1	1	0		1	1	0	1	1	1	1	0	1	1	1	1	1	0	0	1		23
	water transport	1	1	1	1	0	1	1	1	1	1	1	0	1	1	1	0		0	1	0	1	1	1	1	0		1	1	1	0	0	0			21
	other transportation networks	0	1		0	0	0	1	1	1	1	1	1			1	0	1		1	0		0	1	0	0		0	1	1		1	0		1	15
	pipelines, conveyor belts	0	0	1	0	1	1	1	0	1	1	1	0			1	0		1	0	1		1	1	0	0	1	1	1	0		0	0			15
	storage areas, separate logistics	0	0	1	0	1	0	1	0	1	1	1	1			1	0			0	1		1	1	0	0		0	1	1		0	0			13
	Power Distribution Services	1	1		0	0	1	1	0	1	1	1	0			1	1		1	1	1		1	1	0	0		1	1	1	1	0	0	1		19
	Water infrastructure	1	0		1	1	1	1	1	0	1	0	1			1	0			1	1		1	1	1	0		0	1	1	1	1	0			18
	waste treatment	1	0		1	1	1	1	0	1	1	1	0			1	0		1	1	1		1	1	1	0		0	1	1	1	0	0			18
	residential-commercial-industrial mixed	0	1	1	1	0	0	1	0	0	1		0			1	0			1	1		1	0	0	0		1	0	1		0	0		1	12
	e.g. temporary, weekend houses, holiday	0	0	1	0	0	1	1	0	1	1		0			1	0			0	0		1	0	0	0		1	0			0	0			8
	NaturalAreasNotInOtherEconomicUse	1	1	1	0	1		1	0	1	0		1			1	1			1	0		0	0	0	1		1	0			0	0			12
	land fills, re-afforestations, nature recons	0	0		0	0		1	0	0	0		0			1	0			0	0		0	1	0	0		0	0			0	0			3
Totals		24	15	22	21	12	30	42	5	30	37	22	22	7	7	39	5	4	22	18	26	10	29	30	17	1	12	35	25	28	16	11	0	14	11	649
Only green		6	6	6	8	4	8	9	3	9	9	6	7	7	7	10	1	2	6	7	7	9	8	7	9	0	4	8	7	8	8	5	0	6	4	
LULUCF		3	1	2	0	1	0	2	0	2	1	2	2	0	0	5	0	1	5	1	1	0	2	3	0	0	1	4	1	1	1	0	0	1	1	

Level 3

	Albania	Austria	Bulgari	Croatia	Cyprus	Czech R	Denma	Estonia	Finland	France	Germa	Greece	Hungar	Iceland	Italy	Latvia	Liechte	Lithuar	Luxem	Monte	Nether	Norway	Poland	Portug	North M	Roman	Slovaki	Sloven	Spain	Swede	Switzer	Turkey	UK	UK - Northern I	
Level 3	AL	AT	BG	HR	CY	CZ	DK	EE	FI	FR	DE	GK	HU	IS	IT	LV	LI	LT	LU	ME	NL	NO	PL	PT	MK	RO	SK	SI	ES	SE	CH	TR	JK or GE	NI	Total
alimentary crop production	1	0		0	0	0	1	1	1		0	0			1	0		1	1	1		0	0	0	0		0	0	1		0	0			9
fodder crop production	0	0		0	0	0	1	0	1		0	1			1	0		1	0	0		0	0	0	0		0	0	1		0	0			6
industrial crop production	0	0		0	0	0	1	0	1		0	1			1	0		1	0	0		0	0	0	0		0	0	1		0	0			6
energy crop production	0	0		0	0	1	1	0	1		0	1			1	0		1	0	0		0	0	0	0		0	0	1		0	0			7
animal husbandry	0	0		0	0	0	1	0	1		0	0			1	0		1	0	0		0	1	0	0		1	1			1	0			8
storage	0	0		0	0	0	1	0	1			0			1	0		1	0	1		0	1	0	0		1	1			0	0			8
other farming infrastructure	0	0		0	0	0	0	0	1			0			1	0		1	1	1		0	1	0	0		1	1			0	0	1		9
garden land, kitchen/house garden, horti	0	0		0	0	0	1	0	0			0			1	0		1	0	1		0	0	0	0		0	0			0	0	1		5
quarries, open pit mine	1	0		1	1	1	1	0	1	1		1			1	0		1	0	1		0	1	1	0		1	0	1		1	0			16
angling	0	0		0	0	0	0	0	0			0				0			0	0		0	0	0	0		1	0	0		0	0			1
e.g. reindeer, deer	0	0		0	0		0	0	1			0			1	0			0	0		1	0	0	0		1	0			0	0			4
non-cultuvated plants	0	0		0	0	0	1	0	0			0				0			0	0		0	0	0	0		0	0			0	0			1
e.g. textiles, wood, paper, oil, chemicals,	0	0	1	0	0		0	0	1			0				0			0	0		0	1	0	0		1	0	1		0	0			5
e.g. machinery, vehicles, weapons	0	0	1	0	0		0	0	1			0				0			1	0		0	1	0	0		1	0	1		0	0			6
e.g. tobacco, clothing, printing, electronic	0	0	1	0	0		0	0	1			0				0			0	1		0	1	0	0		1	0	1		0	0			6
water energy	1	1	1	1	0	1	0	0	1	1	1	1			1	0		1	0	1		1	1	1	0	1		1	1		0	0	1	1	20
solar energy	0	0	1	0	0	1	1	0	1	1	1	1			1	0		1	0	0		0	1	1	0	1?		0	1		0	0	1	1	14
wind power	0	0	1	1	0	1	1	0	1	1	1	1			1	0		1	0	0		1	1	1	0	1?		0	1		0	0	1	1	16
geo-thermal energy	0	0	1	0	0	0	1	0	1	1	1	1			1	0		1	0	1			1	1	0			0	1		1	0	1	1	15
tidal wave energy	0	0		0	0	0	0	0	1	1	1	0				0		0	0	0			1	0	0		0	0	1		0	0	1	1	7
fossil fuels	0	0		1	0	0	0	0	0	1	1	0			1	0		1	0	0		1	1	0	0			0	1		0	0			8
waste combustion	0	0	1	0	0	0	0	0	0	1	1	0			1	0		1	0	0		0	1	0	0			0	0		0	0			6
biomass combustion	0	0	1	0	0	0	1	0	0	1	0	1			1	0		1	0	0		0	0	1	0			0	0		0	0			7
electric energy distribution	1	1		0	0	1	1	0	0	1	1	0			1	0		1	0	1		1	1	0	0		0	1	1		0	0			13
heat distribution	0	1		1	0	1	0	0	0	1	0	0				0			0	0		0	1	0	0		0	1	0		0	0			6
petrol stations	0	0	1	1	0	1	1	0	0	1	0	1				0		1	0	1		1	1	0	0		1	1	1		0	0			13
church, synagoge, mosque, others	1	1	1	1	0	1	1	0	1	1	0	0			1	0		1	0	1		1	1	0	0		1	1	1		1	0	1		18
monastery	0	1		1	0	1	0	0	0	1	0	0			1	0			0	1		1	1	0	0		1	0	0		0	0			9
cemetery	1	1	1	1	0	1	1	0	1	1	1	1	1	1	1	0		1	1	1	1	1	1	1	0		1	1	1	1	0	0	1		25
indoor cultural service	1	1		1	0	1	1	0	1	1	0	1				0		1	0	1		1	0	0	0		1	1	1		0	0		1	15
outdoor cultural service	1	0		1	0	1	1	0	1	1	1	0			1	0		1	1	1		1	0	0	0		1	0	1		0	0		1	15
e.g. cinemas, amusement parks, betting	0	0		1	0		1	0	1	1		0			1	0			0	1		1	0	0	0		1	1			0	0			9
golf course	0	1		1	0	1	1	0	1	1	1	0			1	0		1	0	0		1	1	1	0		1	0	1		0	0	1	1	16
ski pistes	0	1	1	1	0	1	0	0	1	1	1	0			1	0			0	0		1	1	0	0		1	0	0		0	0			11
outdoor racecourses	0	0		0	0	1	1	0	1	1	1	0			1	0		1	0	0		0	0	0	0		1	0	1		0	0			9
sport halls	0	0	1	1	0	1	1	0	1	1	0	0			1	0		1	1	1		1	1	0	0		1	1	0		0	0		1	15
stadiums	1	0	1	1	0	1	1	0	1	1	1	0			1	0		1	0	1		1	1	0	0		1	0	1		0	0			15
swimming pools	1	0	1	1	0	1	1	0	1	1	1	0			1	0			0	1		1	1	0	0		1	1	1		0	0		1	16
urban greenery and parks	0	1	1	1	0	1	1	0	1	1	1	0	1		1	0		1	0	1		1	1	1	0		1	0	1		0	0	1		18
semi-natural areas and national parks	0	1	1	1	0	1	1	0	1	1	1	1			1	0		1	0	0		0	1	1	0			0	1		1	0		1	16
allotment garden (Schrebergarten)	0	0	1	0	0	1	1	0	1	1	1	0			1	0		1	0	1		0	1	0	0		1	0	0		0	0	1		12
drinking water facilities	0	0	1	1	0		1	1	0	1	1	0			1	0		1	0	1		1	0	0	0		1	1	1		0	0			13
sewage water treatment	0	1	1	0	1		1	0	0	1	1	1			1	0		0	1	1		1	1	1	0		1	1	1		0	0			16
dump sites (solid / liquid)	1	0	1	1	0	1	1	0	1	1	1	0	1	1	1	0		1	0	1	1	0	1	1	0	1	1	1	1	1	0	0	1	1	23
recycling facilities	0	0		1	0		1	0	1	1	0	0			1	0			0	0		0	1	0	0		1	1	0	1	0	0	1	1	11
	11	12	22	22	2	23	32	2	33	31	21	14	3	2	36	0	0	31	7	24	2	20	31	12	0	2	28	17	29	3	5	0	14	13	504
า	2	1	2	2	0	2	2	0	2	2	2	1	2	2	2	0	0	2	1	2	2	1	2	2	0	1	2	2	2	2	0	0	2	1	
	1	2	2	2	0	3	6	1	6	2	2	4	1	0	6	0	0	6	1	2	0	1	2	2	0	0	1	0	6	0	1	0	1	1	

Level 4

		Albania	Austria	Bulgari	Croatia	Cyprus	Czech R	Denma	Estonia	Finland	France	Germa	Greece	Hungar	Iceland	Italy	Latvia	Liechte	Lithuar	Luxem	Monte	Nether	Norwa	Poland	Portug	North M	Roman	Slovaki	Sloven	Spain	Swede	Switze	Turkey	UK	UK - Northern I	
	Level 4	AL	AT	BG	HR	CY	CZ	DK	EE	FI	FR	DE	GK	HU	IS	IT	LV	LI	LT	LU	ME	NL	NO	PL	PT	MK	RO	SK	SI	ES	SE	CH	TR	JK or GE	NI	
	Coal, Oil, Gas, Peat	1	0		0	0		0	0				0				0			0	0		1	1	0	0	1		0			0	0			4
	e.g. relay station, voltage transformation	0	0	1	0	0		0	0				0				0		1	0	0		1	1	0	0			1			0	0			5
	e.g. theater, artistic, museum, library, hist	1		1	1	0		0	0	1			1				0		1	1	1		1	1	0	0		1	1			1	0			13
	e.g. Zoo, botanic garden,	1		1	1	0		0	0	1	1		0				0			1	1		0	1	0	0		1				0	0			9
	e.g. stadiums, sports halls, swimming poo	0			0	0		0	0	1	1		1				0			1	1		1	1	0	0		1	1			0	0			9
	hazardous waste	1	0			0		0	0	0	0	0	0			1	0			0	0		0	1	0	0		1	1			0	0			5
	inert / non-hazardous waste	1	0			0		0	0	0	0	0	0			1	0			0	0		0	1	0	0		1	0			0	0			4
Totals		5	0	3	2	0	0	0	0	3	2	0	2	0	0	2	0	0	2	3	3	0	4	7	0	0	1	5	4	0	0	1	0	0	0	49

7.2 Presence Landscape Characteristics per MS (level 1-4)

Level 1

		Albania	Austria	Bulgari	Croatia	Cyprus	Czech R	Denma	Estonia	Finland	France	Germa	Greece	Hungar	Iceland	Italy	Latvia	Liechte	Lithuar	Luxem	Monte	Nether	Norway	Poland	Portug	North M	Roman	Slovaki	Sloveni	Spain	Swede	Switzer	Turkey	UK	UK - Northern Irel	
Level 0	Level 1	AL	AT	BG	CR	CY	CZ	DK	EE	FI	FR	DE	GK	HU	IS	IT	LV	LI	LT	LU	ME	NL	NO	PL	PT	MK	RO	SK	SI	ES	SE	CH	TR	JK or GE	NI	Total
Land Management	Agricultural Management	1	1		0	1		1		1	0	0	1							1	1		1	0	1			1	1	1		1				14
	Forestry Management	1						1	1								1			1	1															6
	Surface Modification Measures							1												1																2
Spatial Patterns	Spatial Distribution Patterns				1					1			0			1				1			0	0	0			0	0	0						4
	Linear Patterns					1														1																2
	Linear (technical) Networks	1						1	1												1															4
	Macro Landscape forms							1																												1
	Built-up Pattern	1						1	1											1	1										1					6
	BuildingNatureType	1						1												1	1															4
	OtherConstructionNatureType	1						1												1	1		0													4
	Spatial Context	1			1	1		1	1	1			0			1				1	1		1	0	0			0	0	1		1				12
Crop Type (PlotActivityVa	Arable crops	1	1	1	0		1	1		1	1	1	1	1	1	1			1			1	1	1	1		1	1	1	1	1					22
	Pasture / meadow	1	1	1	0	1	1	1		1	1	1	0	1	1	1			1			1	1	1	1		1	1	1	1	1					22
	Permanent crops	1	1	1	0		1	1		1	1	0	1	1	0	1			1	1	1	1	0	1	1		1	1	1	1	1					21
	Mushrooms, energy crops and genetically modified crops							1																												1
	not known																				1															1
Mining Product Type	EndusePotentialValue	1																																		1
	FossilFuelValue							1																	0											1
Ecosystem Types (EUNIS	Constructed, industrial and other artificial	1	1	1	1	1	1	1		1	1	0	1	1	0	1					1	1	1	1	1		1	1	1	0	1			1	1	23
	Regularly or recently cultivated agricultural	1	1	1	1			1		1		0	1	1	0	1					1	1	1	1	0			1	0	0	1						15
	Grassland and tall forb		1	1	1	1		1		1		0	1	1	0	1					1	1	0	1	1		1	1	0	1	0	1			1	1	19
	Agricultural mosaics	1	0	1	1			1		0		0	1	1	0	1					1	1	0	0	1			1	0	0	0				1	1	13
	Woodland and forest	1	1	1	1	1	1	1		1	1	1	1	1		1				1	1		1	1	1		1	1	1	1		1		1	1	25
	Heathland, shrub and tundra		0	1	1	1		1		1		1	1	NR	1	1				1		1	1	0	1		1	1	0	1	0	1		1	1	19
	Transitional woodland	1	1	1	1					1		0	1	1	1	1						1	0	1	0		1	1	1	1	0			1		16
	Inland unvegetated or sparsely vegetated		1	1	1			1		1		1	1	1	1	1					1	1	1	0	1		1	1	1	1	0			1	1	20
	Mire, bog, fen	1	0	1	1		1	1		1		0	1			1			1	1			1		1			1	1	1		1				16
	Coastal salt marshes		0		1			1		1		1	1	NR	0	1						1	0	0	1		1	0	0	1	1			1	1	13
	Intertidal flats		0		1					0		1	0	NR	1							1	0	0	1		1	0	0	1	0			1		8
	Mangroves		0		1					0		0	0										0		0			0	0	1						2
	Coastal lagoons		0	1	1	1				0		0	1	NR	1	1			1			1	0	0	1		1	0	0	1	0			1	1	13
	Estuaries		0	1	0			1		0		1	1	NR	1				1			1	0	0	1		1	0	0	1	0					10
	Inland surface water	1	1	1	1	1	1	1	1	1		1	1			1				1	1		0		1		1	1	1	1	1	1		1	1	23
	Marine		0	1	1	1				1		1	0	NR	0	1	1					1	1	1	1		1	0	1	1	1			1	1	17
Height Zone	planar															1				1											1					3
	collin															1															1					2
	submontane															1															1					2
	montane															1															1					2
	high montane															1																				1
	subalpine															1																				1
	alpine															1															1					2
	nivel															1																				1
(Bio-)Physical Characteri	Abiotic Characteristics		0		1	1		1		0			0										0		0				0	1		1				5
	Biotic / Vegetation Characteristics		0		0	1		1		1	1		1			1	1			1	1		0		1			0				1				11
	Water Characteristics	1	0		1	1		1	1	1	1		0			1				1	1		0		0			0				1				11
Status	under construction				0			1		1		1	0	1	1	1					1	1	0	1	1			1	0	0	0					11
	not in use (never been)		0		0					1	1	0	0										0		0			0	0	0					2
	out of use (temporarily		0		0					1	1	0	0								1		0		0			0	0	0					3
	abandoned		0		0		1			1	1	1	0			1					1		0		0			1	0	1					8
	clear cut		0		0					0	1	0	0										0	1	0			0	0	1	1				4
	collapsed		0		0					1	0	1	0								1		0		0			1	0	0					4
	contaminated				0					0	0	0	0			1							1		0			1	0	0					3
	Damaged		0		0	1				0	0		0	1		1						0	0	1	1			1	0	1		1				8
	Damage Reason		0	1	0		1	1		1	0		0										0		1			0	0			1				6
	unknown status	1			0	1		1		0	1	1	0								1		0		0			1	0	0					7
General Parameters	Width [m]				0					0		1	0			1							0		0			0		0					2
	Height [m]	1			0	1		1		1		1	0	1	0	1						1	0	0	0			1		1	1			1	1	13
	% cover				0	1				1		1	0			1							0		0			0	0	1	1					6
Temporal Parameters	duration				0			1		1		0	0										0		0			0	0	0					2
	period				0	1				1		0	0										0		0			0	0	0		1			3
	recurring frequency				0					1		0	0										0		0			0	0	0					1
Totals		21	11	17	19	19	9	33	6	30	12	17	17	13	9	35	3	0	6	17	23	17	12	12	21	0	15	21	11	24	11	19	0	13	11	504
Only green		8	8	13	11	8	4	13	0	13	4	10	12	12	9	16	1	0	5	2	7	17	7	10	15	0	13	13	7	14	8	3	0	11	9	
LULUCF		2	1	2	2	1	2	3	0	3	1	1	2	1	0	2	0	0	1	2	1	0	2	1	2	0	1	2	2	2	0	2	0	1	1	

Level 2

		Albania	Austria	Bulgari	Croatia	Cyprus	Czech R	Denma	Estonia	Finland	France	Germa	Greece	Hungar	Iceland	Italy	Latvia	Liechte	Lithuar	Luxemt	Monte	Nether	Norway	Poland	Portuga	North M	Roman	Slovaki	Sloven	Spain	Swede	Switzer	Turkey	UK	UK - Northern Irel	
	Level 2	AL	AT	BG	HR	CY	CZ	DK	EE	FI	FR	DE	GK	HU	IS	IT	LV	LI	LT	LU	ME	NL	NO	PL	PT	MK	RO	SK	SI	ES	SE	CH	TR	JK or GE	NI	Total
	Agricultural Land Type	1	1		0			1		1	1		1			1		1	1	1	1		Partly		1		1		1	1		1				16
	Cultivation Practices	1			0			1		1	0		1			1			1		1		0		1				1	1						10
	Cultivation Measures				0	1		1		0	0		0			1			1	1	1		0		1				0	1						8
	Forestry Practice	1						1								1				1	1															5
	Forestry Harvesting Method							1								1																				2
	Forestry Measures							1																												1
	Forestry Products							1								1																				2
	Forest History Type							1								1				1																3
	artificially modified natureal surface																			1																1
	artificial snow present																																			0
	terraced							1																												1
	homogenous				1					1		0	0										0		0			0	0							2
	mixed				1					0		0	0	0	0					1		1	0	0	0			1	0		1					5
	mosaic				1					0		0	0	1	0							0	0	0	0			0	0		1					3
	scattered				1					0		0	0										0		0			0	0							1
	hedge rows				1															1																2
	rows of trees				1															1																2
	stone walls				1																															1
	roads	1			1			1	1												1															5
	pipelines				1			1												1	1															4
	e.g. Sand Dune, Moraine, Gully, Gorge				1			1																												2
	scattered single houses, discontinous	1			1			1								1																				4
	single blocks, discontinous	1			1			1								1																				4
	suburban row houses/terraced/semi detach	1			1			1								1				1	1															6
	city street blocks, closed front	1			1			1								1																				4
	large complex buildings, big halls	1			1			1								1				1																5
	adapted to INSPIRE DS BU	1			1			1												1	1															5
	adapted to INSPIRE DS BU	1			1			1												1	1															5
	urban	1			1	1		1	1	0		0	0	1	0	1				1	1	1	1	0	0			1	1	1	1	1		1	1	18
	rural	1			1	1		1		0		0	0			1				1	1		0		0			1	1	1				1		11
	riparian	1	1		1	1				0		0	0			1					1		0		0			1	1	1				1		10
	coastal	1			1	1		1	1	0		0	0	NR	0	1					1	1	0	0	0			0	1	1	0			1		11
	mountain	1			1	1				0		0	0								1		1		0			1	0	1						7
	island				1	1		1		0		0	0			1					1		0		0			0	0	1				1		7
	inland	1			1			1		1		0	0	NR	0						1	1	0	0	0			0	0	1	0			1		8
	Cereals for the production of grain		1		0			1		1	1	0	1			1			1				0		1			0	1	1						10
	Dried pulses and protein crops for the production of grain				0			1		1	1	0	1			1			1				0		1			0	1	1						9
	potatoes		1		0			1		1	1	0	1			1			1				0		1			0	1	1				1		11
	sugar beet		1		0			1		1	1	0	1			1			1				0		1			0	1	1						10
	fodder roots and brassicas				0					1	1	0	0			1			1				0		1			0	1	1						7
	Industrial crops		1		0		1	1		1	1	0	1			1			1				0		1			0	1							10
	Fresh vegetables, melons and strawberries		1		0			1		1	1	0	0			1		1	1				0		1			0	1	1						10
	Flowers and ornamental plants		1		0			1		1	1	0	1			1							0		1			0	0	1						8
	Plants harvested green				0			1		1	0	0	1			1			1				0		0			0	0							5
	arable land seed and seedlings		1		0			1		1		0	0			1			1				0		1			0	0	0						6
	other arable land crops				0					1		0	0			1			1				0		1			0	0	0						4
	fallow land (not crop)		1		0			1		1		0	1			1			1				0		1			0	0	1						8
	kitchen gardens				0					1		1	0			1			1		1		0		0			0	0	0						5

	Fruit and berry plantations	1	1		0		1	1		1	1	1	1	1		1			1				0		1			0	1	1						14
	Citrus plantations				0			1		0	1	0	1			1						NR	0		1			0	0	1						6
	Olive plantations	1			0					0	1	0	1	NR	0	1						NR	0	0	1			0	1	1	0			No		7
	Vineyards	1	1	1	0		1	1		0	1	1	1	1	0	1		1		1	1	1	0	1	1			0	1	1	0					18
	Nurseries		1	1	0		1	1		1	1	1	1			1			1				0		1			0	1	1						13
	Other permanent crops		1		0		1	1		0	1	0	1			1			1				0		1			0	1	1						10
	Mushrooms, energy crops and genetically modified		1					1																												2
	energy crops		1					1																												2
	genetically modified crops		1																																	1
	adapted to INSPIRE DS Mineral Resources		1																																	1
	adapted to INSPIRE DS Energy Resources Base		1		0			1																	0											2
	inland marshes	1	0	1	0		1	1		1		1	1	1	1	1				1		1	1	1	1		1	1	1	1	1	1		1	1	23
	Peatbogs	1	0	1	0		1	1		1		1	0	NR	1	1						1	0	0	0		1	1	1		1	1		1	1	16
	Soil Sealing Degree %				0	1				0		1	0			1									0				0							3
	Leaf Form		0		0			1		1			1			1							1		1			1	1	1		1				10
	Leaf character		0		0			1		1			0			1							1		1				0	1						6
	Phenology		0		0			1		1			0			1							0		0				0	0						3
	Foliage Persistence		0		0			1		1	1		0			1							1		1				0	1						7
	Plant Location				0			1		1			0			1					1		0		0				0	0						4
	Crown cover density %				0																															0
	Species Type				0			1									1																			2
	Species Origin				0			1																												1
	PlantCommunityType				0																															0
	Inland Water Origin	1			0			1	1											1	1															5
	Hydrological Persistence	1	0		0	1				1			0										0		0				1	1						5
	Wetness	1	0		0	1		1	1	0		1	0	1	0					1	1	0	0	0	0			1	1	0	1					11
	Salinity (Water or Soil)		1		0	1				0		0	0	NR	?	1						0	0	1	0		1	1	0	0	1					7
	Tidal Influence yes/no		0		0	1		1		0		0	0	NR	1							1	0		0			0	0	0	0			1		5
	Snow Height		0		0					0	1		0										0		0		1	1	0	0					1	4
	yes/no				0					0	0	0	0	1	0							0	0	1	1			1		0	0					4
	earthquake		0		0	1				0	0	0	0										0		0			0	0	0						1
	landslide		0		0		1			0	0	0	0										0		0			1	0	0		1				3
	snow avalanche		0	1	0					0	0	0	0	NR	1	1						NR	0	0	0			0	0	0	0					3
	flood		0	1	0					1	0	0	0										0		0			0	0	0						2
	drought		0		0					0	0	0	0										0		0			0	0	0						0
	fires		0	1	0	1		1		0	0	1	0	1	0	1						0	0	0	1			0	0	1	0					8
	tornados, hurricanes, strong winds		0	1	0					0	0	0	0	0	0							0	0	0	0			0	0	0	0			1		2
	biological		0	1	0					0	0	0	0	0	0							0	0	0	0			0	0	0	0					1
Totals		25	20	9	24	14	8	55	5	28	17	9	18	8	4	47	1	3	18	19	21	8	6	4	26	0	5	13	23	30	7	6	0	11	4	496

Level 3

		Albania	Austria	Bulgari	Croatia	Cyprus	Czech R	Denma	Estonia	Finland	France	Germa	Greece	Hungar	Iceland	Italy	Latvia	Liechte	Lithuar	Luxemt	Monte	Nether	Norway	Poland	Portug	North M	Roman	Slovaki	Sloven	Spain	Swede	Switze	Turkey	UK	UK - Northern Irel	
	Level 3	AL	AT	BG	HR	CY	CZ	DK	EE	FI	FR	DE	GK	HU	IS	IT	LV	LI	LT	LU	ME	NL	NO	PL	PT	MK	RO	SK	SI	ES	SE	CH	TR	JK or GE	NI	Total
	arable crop land	1	1	1	0			1		1	0	1	1	1	1	1			1			1	1	1	1			1	0	1	1			1		19
	permanent crop land		1	1	0			1		1		1	1	1	0	1			1			1	1	0	1			1	0	1	1			1		16
	permanent grassland		1	1	0			1		1		1	0	1	1	1			1			1	1	0	1			1	1	1	1			1	1	18
	crop rotation				0			1		0		0	0	0	0	1			1			0	0	0	1		1	0	0	0	1					6
	no crop rotation				0					0		0	0			1							0	0	0		1	0	0	0						2
	plantation	1			0			1		1		1	1	1	0	1						0	0	1	0		1	0	0	0	1					10
	extensive orchards		1		0			1		0		1	1			1				1	1		0		0			1	1	0						9
	agroforestry	1			0			1		1		0	0	NR	0	1						0	0	0	1			0	0	1	0					6
	shifting cultivation (slash&burn)				0					0		0	0			1							0		0			0	0	0						1
	intercropping				0			1		0		0	0	NR	0	1						0	0	0	1			0	0	1	0					4
	paddy field cultivation			1	0					0		0	1	0	0	1						NR	0	0	1			0	0	1	0			No		5
	Fertilizing Activity yes/no				0	1				0		0	0	0	1	1						1	0	0	0				0	0	0					4
	Fertilizing Type				0							0				1							0													1
	Irrigation yes/no	1			0					0		0	0	0	0							0	0	1	1			1	1	1	0					6
	Irrigation Method											0											0													0
	Irrigation Source	1						1												1	1		0													4
	Drainage	1			0					0	0	0	0								1		0		0			1	1	0						4
	Mowing		1		0					0		0	0	0	1	1		1	1			1	0	0	0			0	0	1	1					8
	Grazing				0			1		1		0	0	0	0	1		1	1	1		0	0	0	1			0	0	1	1					9
	Shrub Clearance																																			0
	Biomass Burning																																			0
	Liming																																			0
	Pruning							1																												1
	Growing Season							1																												1
	even-aged monoculture plantation																																			0
	even-aged mixed forest																																			0
	uneven-aged mixed forest (selection forest)	1																		1																2
	natural forest (non-homogenized)							1												1																2
	clearcutting																																			0
	selective logging																																			0
	coppicing							1																												1
	thinning																																			0
	timber							1								1																				2
	energy wood							1																												1
	pulp																																			0
	endemic/primary							1																												1
	re-forestation							1																												1
	af-forestation																																			0
	to be further subdivided																																			0
	e.g. arch, bunker, canopy, castle, cave buildi	1				1		1												1	1															5
	e.g. acoustic fence, antenna, bridge, chimne	1				1		1												1																4

	common wheat and spelt		1		0			1		1	1	0	0			1			1				0		1			0	1	1						9
	durum wheat		1		0			1		0	1	0	0			1			1				0		0			0	1	1						7
	rye		1		0			1		1	1	0	0			1			1				0		1			0	1	1						9
	barley		1		0			1		1	1	0	0			1			1				0		1			0	1	1				1		10
	oats		1		0			1		1	1	0	0			1			1				0		1			0	1	1						9
	grain maize		1		0			1		1	1	0	0			1			1				0		1			0	1	1				1		10
	rice			1	0					0	1	0	1	0	0	1						NR	0	0	1			0	0	1	0			No		6
	other cereals for the production of grain		1		0			1		1	1	0	1			1			1				0		1			0	1	1				1		11
	peas, field beans and sweet lupins		1		0					1	1	0	0			1			1				0		1			0	1	1				1		9
	other dry pulses				0					1	1	0	0			1							0		1			0	1	1						6
	tobacco				0					0	1	0	1			1							0		1			0	0	1				No		5
	hops		1		0		1			1	1	1	1	0	0	1						1	0	1	1			0	1	1	0					12
	cotton				0					0	0	0	1			1							0		1			0	0	1						4
	rape and turnip rape		1		0			1		1	1	0	0			1			1				0		1			0	1	1				1		10
	sunflower		1		0			1		1	1	0	1			1			1				0		1			0	1	1						10
	soya		1		0			1		0	1	0	0			1			1				0		1			0	1	1						8
	linseed (oil flax)		1		0			1		1	1	0	1			1							0		0			0	1	1						8
	other oil seed crops				0			1		1	1	0	1			1			1				0		1			0	1	1						9
	flax		1		0					1	1	0	1			1			1				0		1			0	1	1						9
	hemp		1		0			1		1	1	0	1			1			1				0		1			0	1	1						10
	other fibre crops				0					1	0	0	0			1			1				0		1			0	1	1						6
	aromatic plants, medicinal and culinary plants		1		0			1		1	1	0	1			1							0		1			0	1	1						9
	other industrial crops not mentioned elsewhere				0			1		1	1	0	0			1							0		1			0	1	1						7
	Temporary grass		1		0					1		0	0			1							0		0			0	0	1						4
	Other plants harvested green				0			1		0		0	1			1							0		0			0	0							3
	Fruit of temperate climate zones				0		1	1		1	1		0			1							0		1			0	0	1						7
	Fruit of subtropical climate zones				0					0	1		0			1							0		1			0	0	1						4
	Berry species				0			1		1	1		0			1			1				0		1			0	1	1						8
	Nuts				0			1		0	1		1			1			1				0		1			0	1	1						8
	Normally producing table olives				0					0	0		0			1							0		0			0	0	1						2
	Normally producing olives for oil production				0					0	0		0			1							0		0			0	0	1						2
	<integer value>				0					0			0												0				0								0
	needle leaved			1	0	1	1	1		1		1	1	1	1	1						1	1	1	1		1		1	1	1	1		1	1	21
	broad leaved			1	0	1	1	1		1		1	1	1	1	1						1	1	1	1		1		1	1	1			1	1	20
	palm leaved		0		0					0		0	0			1							0		0			0	0	1						2
	non-leafy		0		0					0		0	0			1							0		0			0	0	1						2
	sclerophyte	1	0		0					0		0	0	NR	0	1						NR	1	0	1			0	0	1	0					5
	regular		0		0			1		1		0	0			1							0		1			všety	0	1						5
	annual		0		0					0		0	0			1							0		0				0							1
	biennial		0		0					0		0	0			1							0		0				0							1
	perenial		0		0	1				1		0	0			1							0		0				0							3
	ephemeral		0		0					0		0	0			1							0		0				0							1
	evergreen				0			1		1		0	0	0	1	1				1		0	1	0	1				0	1	0			1	1	10
	winter deciduous		0		0					0		0	0			1							1		1				0	1				1	1	6
	summer deciduous		0		0					1		0	0			1							0		0				0	1						3
	terrestrial				0	1		1		1		0	0			1				1			0		0				0	1						6
	aquatic submerged				0					0		0	0			1							0		0			0	0							1
	aquatic emergent			1	0					0		0	0			1							0		0			0	0							2
	<integer value>				0							0	0										0													0
	EU-Nomen species list				0							0	0										0									1				1
	native				0							0	0										0									1				1
	non-native				0							0	0										0													0
	endemic				0							0	0										0													0
	invasive				0			1				0	0										0													1
	migratory				0			1				0	0										0													1
	European Vegetation Survey could be reference scheme				0							0	0										0													0
	natural	1			0				1			0	0							1			0													3
	controlled/regulated	1			0			1	1			0	0										0													3
	man-made	1			0				1			0	0			1							0													3
	dry	1			0					1		1	0										0		0				1	0						4
	ephemeral	1			0					0		1	0	0	1							0	0	0	0				1	1	0					5
	intermittent	1		1	0					0		0	0	0	1							1	0	0	0				1	1	0					6
	perennial	1		1	0					1		0	0	0	1							1	0	0	0				1	1	1					8
	surface water	1			0			1	1	0			0			1				1	1		0		0				1	0						7
	saturated ground			1	0					1			0										0		0				0	0						2
	saline	1			0	1				0			0	NR		1						1	0	0	0				1	0	1					6
	brine				0					0			0										0		0				0	0						0
	brackish				0					0			0	NR								0	0	0	0				0	0	1					1
	fresh				0					1			0	NR								1	0	0	0				0	0	1					3
	ultra fresh				0					0			0										0		0				0	0						0
	<integer value>				0					0			0										0		0		1		0							1
Totals		19	22	11	0	8	4	48	4	38	25	10	20	6	10	66	0	2	23	11	5	12	8	6	40	0	6	6	34	52	13	3	0	12	5	529
Only green		9	5	9	0	4	3	11	0	12	2	8	8	6	10	18	0	2	6	2	0	12	7	6	15	0	4	4	9	18	13	1	0	6	4	
LULUCF		5	1	1	0	1	0	8	4	3	0	1	1	0	0	9	0	0	0	5	2	0	0	0	1	0	1	1	2	3	0	0	0	0	0	

Level 4

		Albania	Austria	Bulgari	Croatia	Cyprus	Czech R	Denma	Estonia	Finland	France	Germa	Greece	Hungar	Iceland	Italy	Latvia	Liechte	Lithuar	Luxemt	Monter	Nether	Norway	Poland	Portug	North M	Roman	Slovaki	Sloven	Spain	Swede	Switze	Turkey	UK	UK - Northern Irel	
	Level 4	AL	AT	BG	HR	CY	CZ	DK	EE	FI	FR	DE	GK	HU	IS	IT	LV	LI	LT	LU	ME	NL	NO	PL	PT	MK	RO	SK	SI	ES	SE	CH	TR	JK or GE	NI	Total
	Streuobstwiese				0					0			1										0		0				0							1
	dehesa / montado				0					0			0										0		1				0							1
	Organic fertilizer				0											1							0													1
	Synthetic fertilizer				0																		0													0
	surface irrigation				0																		0													0
	sprinklet irrigation				0																		0													0
	drop irrigation				0																		0													0
	groundwater				0																		0													0
	reservoir	1			0																		0													1
	water course	1			0															1	1		0													3
	unknown	1			0			1															0													2
	ditches, trenches				0					0		0	0								1		0		0				1	0						2
	passing drills				0					0		0	0										0		0				1	0						1
	filled ditches				0					0		0	0										0		0				1	0						1
	unknown type				0					0		0	0										0		0				1	0						1
	none (natural)				0					0			0										0		0				0	0						0
	1 time (semi-natural, extensive)		1		0					0			0										0		0				0	0						1
	2 times (medium intensity)		1		0					0			0										0		0				0	0						1
	> 2 x (intensive)		1		0					0			0										0		0				0	0						1
	uknown				0					0			0										0		0				0	0						0
	intensive (>2 livestock unit/ha)		1		0			1		0			0	0	0							0	0	0	0				0	0	0					2
	extensive, freerange (<2 livestock unit/ha)		1		0					0			0	0	0							0	0	0	0				0	0	0					1
	unknown intensity				0			1		1			0										0		0				0	0						2
	yes/no																																			0
	yes/no																																			0
	yes/no																																			0
	yes/no																																			0
	growing season start							1																												1
	growing season end							1																												1
	permanently present							1																												1
	replanting clear cut areas							1																												1
	planting new forest																																			0
	green maize		1		0			1		0	0		1										0		0			0	0	0						3
	leguminous plants				0			1		0	1		1										0		0			0	0	0						3
	other plants harvested green				0			1		0			0										0		0			0	0	0						1
Totals		3	6	0	0	0	0	10	0	1	1	0	3	0	0	1	0	0	0	1	2	0	0	0	1	0	0	0	4	0	0	0	0	0	0	33
Only green		0	2	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
LULUCF		0	3	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

Level 5

		Albania	Austria	Bulgari	Croatia	Cyprus	Czech R	Denma	Estonia	Finland	France	Germa	Greece	Hungar	Iceland	Italy	Latvia	Liechte	Lithuan	Luxem	Monte	Nether	Norway	Poland	Portug	North M	Roman	Slovaki	Sloven	Spain	Swede	Switzer	Turkey	UK	UK - Northern Irel	
	Level 5	AL	AT	BG	HR	CY	CZ	DK	EE	FI	FR	DE	GK	HU	IS	IT	LV	LI	LT	LU	ME	NL	NO	PL	PT	MK	RO	SK	SI	ES	SE	CH	TR	JK or GE	NI	Total
	animal manure																																			0
	green manure																																			0
	bog regeneration				0					0			0										0		0				0							0
	e.g. natural grassland				0					0			0										0		0				0							0
	e.g. semi-natural grassland				0					0			0										0		0				0							0
	e.g. pasture, meadow				0					0			0										0		0				0							0
	e.g. pasture, meadow				0					0			0										0		0				0							0
	e.g. pasture, meadow				0					0			0			1							0		0				0							1
	e.g. semi-natural grassland				0					0			0			1							0		0				0							1
Totals		0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2

7.3 Number of MS covering Land Use Attributes (CLC+ Legacy and CLC+ LULUCF)

CLC+ Legacy		Number	Percentage	CLC+ LULUCF		Number	Percentage
Level 1	Agriculture	21	61.8%	Level 1	Forestry	23	67.6%
	Manufacturing / producing inc	22	64.7%		Transport networks	21	61.8%
	Energy production	23	67.6%		no economic use	3	8.8%
	Commercial Services	18	52.9%		nature protection	9	26.5%
	Financial, Professional and Inf	13	38.2%		no economic use	4	11.8%
	Accommodation and Food Se	17	50.0%				
	Comunity Services	24	70.6%				
	Cultural, Entertainment and R	23	67.6%				
	Logistics and Storage	16	47.1%				
	Utilities	22	64.7%				
	permanent residential	24	70.6%				
	Residential Use with Other Co	20	58.8%				
	other residential	19	55.9%				
	nature protection	28	82.4%				
Level 2	Farming Infrastructure	19	55.9%	Level 2	Commercial Crop Prod	16	47.1%
	surface mining	27	79.4%		Production for own cor	9	26.5%
	salines	10	29.4%		short rotation	4	11.8%
	Sports Infrastructure	26	76.5%		intermediate / long rot	5	14.7%
	Open Air Recreational Areas	18	52.9%		continuous cover	10	29.4%
	Other Recreational Services	10	29.4%				
	road network (incl. parking lo	30	88.2%				
	railway network	27	79.4%				
	air transport	23	67.6%				
	water transport	21	61.8%				
	Power Distribution Services	19	55.9%				
	Water infrastructure	18	52.9%				
Level 3	cemetery	25	73.5%	Level 3	alimentary crop produc	9	26.5%
	dump sites (solid / liquid)	23	67.6%		fodder crop production	6	17.6%
					industrial crop producti	6	17.6%
					energy crop production	7	20.6%
					urban greenery and par	18	52.9%
					semi-natural areas and	16	47.1%

7.4 Number of MS covering Landscape Characteristics (CLC+ Legacy and CLC+ LULUCF)

CLC+ Legacy		Number	Percentage	CLC+ LULUCF		Number	Percentage
Level 1	Arable crops	22	64.7%	Level 1	Woodland and forest	25	73.5%
	Pasture / meadow	22	64.7%		Mire, bog, fen	16	47.1%
	Permanent crops	21	61.8%		duration	2	5.9%
	Constructed, industrial and other artifici	23	67.6%				
	Regularly or recently cultivated agricultu	15	44.1%				
	Grassland and tall forb	19	55.9%				
	Agricultural mosaics	13	38.2%				
	Heathland, shrub and tundra	19	55.9%				
	Transitional woodland	16	47.1%				
	Inland unvegetated or sparsely vegetate	20	58.8%				
	Coastal salt marshes	13	38.2%				
	Intertidal flats	8	23.5%				
	Coastal lagoons	13	38.2%				
	Estuaries	10	29.4%				
	Inland surface water	23	67.6%				
	Marine	17	50.0%				
	under construction	11	32.4%				
	Damaged	8	23.5%				
	Height [m]	13	38.2%				
Level 2	mixed	5	14.7%	Level 2	Cultivation Practices	10	29.4%
	mosaic	3	8.8%		Forestry Practice	5	14.7%
	urban	18	52.9%		Forestry Harvesting Method	2	5.9%
	coastal	11	32.4%		Forestry Measures	1	2.9%
	inland	8	23.5%		Forest History Type	3	8.8%
	Fruit and berry plantations	14	41.2%		Leaf Form	10	29.4%
	Olive plantations	7	20.6%		Leaf character	6	17.6%
	Vineyards	18	52.9%		Inland Water Origin	0	0.0%
	inland marshes	23	67.6%				
	Peatbogs	16	47.1%				
	Wetness	11	32.4%				
	Salinity (Water or Soil)	7	20.6%				
	Tidal Influence yes/no	5	14.7%				
	yes/no	4	11.8%				
	snow avalanche	3	8.8%				
	fires	8	23.5%				
	tornados, hurricanes, strong winds	2	5.9%				
	biological	1	2.9%				
Level 3	arable crop land	19	55.9%	Level 3	no crop rotation	2	5.9%
	permanent crop land	16	47.1%		extensive orchards	9	26.5%
	permanent grassland	18	52.9%		shifting cultivation (slash&bu	1	2.9%
	crop rotation	6	17.6%		even-aged monoculture plan	0	0.0%
	plantation	10	29.4%		even-aged mixed forest	0	0.0%
	agroforestry	6	17.6%		uneven-aged mixed forest (s	2	5.9%
	intercropping	4	11.8%		natural forest (non-homoger	2	5.9%
	paddy field cultivation	5	14.7%		clearcutting	0	0.0%
	Fertilizing Activity yes/no	4	11.8%		selective logging	0	0.0%
	Fertilizing Type	1	2.9%		coppicing	1	2.9%
	Irrigation yes/no	6	17.6%		thinning	0	0.0%
	Mowing	8	23.5%		endemic/primary	1	2.9%
	Grazing	9	26.5%		re-forestation	1	2.9%
	rice	6	17.6%		af-forestation	0	0.0%
	hops	12	35.3%		palm leaved	2	5.9%
	needle leaved	21	61.8%		non-leafy	2	5.9%
	broad leaved	20	58.8%		regular	5	14.7%
	sclerophyte	5	14.7%		perenial	3	8.8%
	evergreen	10	29.4%		natural	3	8.8%
	ephemeral	5	14.7%		controlled/regulated	3	8.8%
	intermittent	6	17.6%		man-made	3	8.8%
	perennial	8	23.5%		surface water	7	20.6%
	saline	6	17.6%		saturated ground	2	5.9%
	brine	0	0.0%				
	brackish	1	2.9%				
	fresh	3	8.8%				
level 4	Organic fertilizer	1	2.9%	Level 4	none (natural)	0	0.0%
	Synthetic fertilizer	0	0.0%		1 time (semi-natural, extensi	1	2.9%
	intensive (>2 livestock unit/ha)	2	5.9%		2 times (medium intensity)	1	2.9%
	extensive, freerange (<2 livestock unit/h	1	2.9%		> 2 x (intensive)	1	2.9%
					uknown	0	0.0%
					unknown intensity	2	5.9%

7.5 Overview of number of datasets per MS per database characteristic

7.5.1 Temporal extent

Country	2019	2018	2017	2016	2015	Older	Other	No Data
Albania	5	1	3	8	9	8	0	5
Austria	4	2	0	1	1	15	14	8
Bulgaria	7	1	9	3	1	4	3	1
Croatia	83	26	27	21	53	106	0	152
Cyprus	3	0	7	0	18	13	0	12
Czech Republic	2	0	0	0	0	6	0	8
Denmark	15	15	18	15	17	18	0	2
Estonia	2	0	2	7	6	35	0	0
Finland	1	1	4	1	0	0	1	7
France	0	2	0	0	0	0	1	36
Germany	0	1	0	0	0	0	1	0
Greece	0	0	0	0	0	0	3	0
Hungary	5	2	1	1	1	3	0	0
Iceland	0	1	0	0	0	0	34	3
Italy	24	9	16	10	3	59	3	143
Kosovo	2	4	0	0	2	0	0	0
Latvia	40	1	1	10	5	21	0	0
Liechtenstein	0	0	0	0	0	3	5	0
Lithuania	0	0	0	0	0	14	0	3
Luxembourg	41	32	52	107	3	49	0	25
Montenegro	0	5	0	0	0	0	0	11
Multicountry	8	5	0	2	4	4	0	0
Netherlands	4	2	0	1	1	0	0	1
Norway	1	14	0	0	0	0	24	0
Poland	0	0	0	0	0	0	0	19
Portugal	1	13	0	3	3	4	0	0
North Macedonia	3	1	7	2	2	21	0	2
Romania	1	4	1	3	4	12	0	2
Serbia	0	0	0	0	0	1	0	0
Slovakia	0	0	0	0	0	0	1	43
Slovenia	0	0	1	0	1	4	0	3
Spain	1	3	3	0	0	6	0	2
Sweden	0	4	0	0	4	2	3	4
Switzerland	28	31	46	12	20	191	0	16
Turkey	0	0	2	0	0	0	0	3
UK	6	0	0	1	3	3	0	2
UK - Northern Ireland	0	0	0	0	2	25	0	7

7.5.2 Language

Country	National	English	National and English	No Data
Albania	34	5	0	0
Austria	44	1	0	0
Bulgaria	15	14	0	0
Croatia	458	1	9	0
Cyprus	20	33	0	0
Czech Republic	10	6	0	0
Denmark	85	15	0	0
Estonia	52	0	0	0
Finland	10	1	4	0
France	36	1	1	1
Germany	2	0	0	0
Greece	3	0	0	0
Hungary	5	1	6	1
Iceland	8	0	29	1
Italy	187	2	0	78
Kosovo	0	0	0	8
Latvia	62	8	7	1
Liechtenstein	8	0	0	0
Lithuania	11	6	0	0
Luxembourg	83	224	1	1
Montenegro	0	5	0	11
Multicountry	1	22	0	0
Netherlands	8	1	0	0
Norway	39	0	0	0
Poland	16	0	2	1
Portugal	15	0	9	0
North Macedonia	0	6	30	2
Romania	22	2	0	3
Serbia	0	1	0	0
Slovakia	31	0	0	13
Slovenia	9	0	0	0
Spain	14	0	3	0
Sweden	14	0	0	1
Switzerland	343	0	0	1
Turkey	5	0	0	0
UK	0	15	0	0
UK - Northern Ireland	0	34	0	0

7.5.3 Coverage

Country	National	Local	Multicountry	No Data
Albania	39	0	0	0
Austria	23	21	0	1
Bulgaria	24	4	0	1
Croatia	442	18	8	0
Cyprus	53	0	0	0
Czech Republic	16	0	0	0
Denmark	100	0	0	0
Estonia	52	0	0	0
Finland	15	0	0	0
France	37	0	2	0
Germany	2	0	0	0
Greece	1	2	0	0
Hungary	13	0	0	0
Iceland	27	0	0	11
Italy	13	226	0	28
Kosovo	7	0	0	1
Latvia	78	0	0	0
Liechtenstein	8	0	0	0
Lithuania	16	1	0	0
Luxembourg	300	7	0	2
Montenegro	16	0	0	0
Multicountry	0	0	23	0
Netherlands	8	0	1	0
Norway	20	18	0	1
Poland	6	1	0	12
Portugal	21	3	0	0
North Macedonia	28	10	0	0
Romania	23	1	0	3
Serbia	1	0	0	0
Slovakia	31	0	0	13
Slovenia	9	0	0	0
Spain	13	2	0	0
Sweden	16	0	0	1
Switzerland	300	15	18	11
Turkey	5	0	0	0
UK	15	0	0	0
UK - Northern Ireland	34	0	0	0

7.5.4 Representation type

Country	Raster	Vector	Tabular	No Data
Albania	33	6	0	0
Austria	2	36	0	7
Bulgaria	0	27	2	0
Croatia	67	333	66	2
Cyprus	6	39	2	6
Czech Republic	0	16	0	0
Denmark	7	72	0	21
Estonia	2	16	0	34
Finland	3	12	0	0
France	12	15	8	4
Germany	0	2	0	0
Greece	0	3	0	0
Hungary	3	10	0	0
Iceland	1	23	0	14
Italy	8	169	6	84
Kosovo	0	0	0	8
Latvia	0	26	0	52
Liechtenstein	1	7	0	0
Lithuania	0	16	1	0
Luxembourg	14	205	0	90
Montenegro	0	16	0	0
Multicountry	6	17	0	0
Netherlands	1	7	0	1
Norway	0	39	0	0
Poland	0	15	1	3
Portugal	0	22	2	0
North Macedonia	7	25	2	4
Romania	1	22	2	2
Serbia	0	0	0	1
Slovakia	1	22	3	18
Slovenia	0	8	1	0
Spain	1	13	1	0
Sweden	4	12	0	1
Switzerland	42	188	9	105
Turkey	5	0	0	0
UK	3	8	4	0
UK - Northern Ireland	0	23	11	0

7.5.5 Minimum mapping unit

Country	Known	Not Known	No Data
Albania	0	0	39
Austria	1	0	44
Bulgaria	12	2	15
Croatia	101	0	367
Cyprus	2	0	51
Czech Republic	1	15	0
Denmark	0	0	100
Estonia	0	0	52
Finland	4	1	10
France	0	0	39
Germany	2	0	0
Greece	3	0	0
Hungary	6	4	3
Iceland	1	34	3
Italy	25	53	189
Kosovo	0	0	8
Latvia	0	0	78
Liechtenstein	0	4	4
Lithuania	2	0	15
Luxembourg	0	0	309
Montenegro	0	0	16
Multicountry	8	0	15
Netherlands	0	7	2
Norway	14	25	0
Poland	1	0	18
Portugal	1	0	23
North Macedonia	0	0	38
Romania	0	0	27
Serbia	0	0	1
Slovakia	0	1	43
Slovenia	2	0	7
Spain	6	1	8
Sweden	3	0	14
Switzerland	0	0	344
Turkey	0	0	5
UK	3	0	12
UK - Northern Ireland	0	0	34

7.5.6 Minimum mapping unit (detailed)

Country	Small	Large	Other	No Data
Albania	0	0	0	39
Austria	0	1	0	44
Bulgaria	12	0	3	14
Croatia	73	28	0	367
Cyprus	0	2	0	51
Czech Republic	1	0	0	15
Denmark	0	0	0	100
Estonia	0	0	0	52
Finland	4	0	1	10
France	0	0	0	39
Germany	2	0	0	0
Greece	3	0	0	0
Hungary	4	2	4	3
Iceland	0	1	34	3
Italy	24	1	53	189
Kosovo	0	0	0	8
Latvia	0	0	0	78
Liechtenstein	0	0	4	4
Lithuania	2	0	0	15
Luxembourg	0	0	0	309
Montenegro	0	0	0	16
Multicountry	6	2	0	15
Netherlands	0	0	7	2
Norway	13	0	26	0
Poland	0	1	0	18
Portugal	1	0	0	23
North Macedonia	0	0	0	38
Romania	0	0	0	27
Serbia	0	0	0	1
Slovakia	0	0	1	43
Slovenia	2	0	0	7
Spain	6	0	1	8
Sweden	3	0	0	14
Switzerland	0	0	0	344
Turkey	0	0	0	5
UK	3	0	0	12
UK - Northern Ireland	0	0	0	34

7.5.7 Format

Country	Shapefile	GeoTIFF	Text	WMS/WFS	GML	Other	No Data
Albania	5	0	0	33	1	0	0
Austria	31	2	0	0	3	2	7
Bulgaria	16	0	1	0	0	12	0
Croatia	316	39	24	0	0	59	30
Cyprus	12	6	4	0	18	13	0
Czech Republic	10	0	0	0	6	0	0
Denmark	14	3	1	16	57	4	5
Estonia	15	3	0	10	0	1	23
Finland	0	0	0	0	0	9	6
France	12	0	5	0	0	10	12
Germany	2	0	0	0	0	0	0
Greece	1	0	0	0	0	2	0
Hungary	10	3	0	0	0	0	0
Iceland	11	0	0	0	0	6	21
Italy	120	5	7	0	0	1	134
Kosovo	8	0	0	0	0	0	0
Latvia	31	0	0	5	2	5	35
Liechtenstein	7	1	0	0	0	0	0
Lithuania	12	0	1	0	3	0	1
Luxembourg	41	0	0	9	115	17	127
Montenegro	16	0	0	0	0	0	0
Multicountry	10	5	0	0	0	7	1
Netherlands	3	0	1	0	3	1	1
Norway	5	0	0	0	19	14	1
Poland	8	0	0	7	0	1	3
Portugal	17	0	0	0	0	7	0
North Macedonia	17	4	0	4	0	9	4
Romania	0	0	0	0	0	0	27
Serbia	0	0	0	1	0	0	0
Slovakia	10	0	3	5	2	3	21
Slovenia	8	0	1	0	0	0	0
Spain	11	0	1	0	0	3	0
Sweden	11	3	0	0	1	1	1
Switzerland	164	34	28	2	0	78	38
Turkey	0	3	0	2	0	0	0
UK	8	0	3	0	0	4	0
UK - Northern Ireland	17	2	13	0	0	2	0

7.5.8 Update frequency

Country	Within 1 year	More than 1 year	Other	No Data
Albania	1	0	0	38
Austria	11	0	8	26
Bulgaria	8	4	16	1
Croatia	115	37	251	65
Cyprus	3	1	5	44
Czech Republic	4	6	6	0
Denmark	14	0	13	73
Estonia	0	0	8	44
Finland	8	4	3	0
France	5	1	1	32
Germany	1	1	0	0
Greece	1	0	2	0
Hungary	3	8	2	0
Iceland	0	1	35	2
Italy	27	11	44	185
Kosovo	0	0	0	8
Latvia	0	0	0	78
Liechtenstein	0	1	7	0
Lithuania	7	1	9	0
Luxembourg	13	3	3	290
Montenegro	0	0	0	16
Multicountry	2	1	1	19
Netherlands	5	1	2	1
Norway	15	0	24	0
Poland	0	1	8	10
Portugal	15	2	7	0
North Macedonia	0	0	0	38
Romania	5	0	17	5
Serbia	0	0	0	1
Slovakia	6	0	7	31
Slovenia	5	1	3	0
Spain	10	3	0	2
Sweden	6	7	1	3
Switzerland	1	2	4	337
Turkey	0	0	0	5
UK	5	6	0	4
UK - Northern Ireland	1	0	0	33

7.5.9 Spatial resolution

Country	High Resolution	Low Resolution	Small Scale	Large Scale	Other	No Data
Albania	1	0	0	1	0	37
Austria	1	1	0	16	0	27
Bulgaria	0	0	0	15	3	11
Croatia	21	0	17	324	0	106
Cyprus	0	0	2	17	0	34
Czech Republic	0	0	3	13	0	0
Denmark	0	0	13	79	0	8
Estonia	2	0	5	16	0	29
Finland	2	1	1	10	0	1
France	0	0	0	4	0	35
Germany	0	0	0	2	0	0
Greece	0	0	3	0	0	0
Hungary	2	0	0	2	0	9
Iceland	0	0	0	1	35	2
Italy	2	1	14	73	6	171
Kosovo	0	0	0	0	0	8
Latvia	0	0	21	44	0	13
Liechtenstein	1	0	0	4	3	0
Lithuania	0	0	0	16	0	1
Luxembourg	1	0	21	39	0	248
Montenegro	0	0	0	0	0	16
Multicountry	0	0	10	8	0	5
Netherlands	1	0	0	7	0	1
Norway	0	0	9	30	0	0
Poland	0	1	1	6	2	9
Portugal	0	0	2	3	5	14
North Macedonia	0	0	13	17	0	8
Romania	0	1	13	9	0	4
Serbia	0	0	0	0	0	1
Slovakia	0	0	5	3	0	36
Slovenia	0	0	0	4	4	1
Spain	0	0	0	12	2	1
Sweden	4	0	0	5	0	8
Switzerland	12	3	49	135	0	145
Turkey	0	0	0	0	2	3
UK	2	2	2	4	0	5
UK - Northern Ireland	0	0	0	1	0	33

7.6 Overview number of datasets per MS for different access conditions

7.6.1 Access

Country	major and multiple constraints for full free and open policy	single severe constraints for full free and open policy	Creative Commons BY 3.0 license	minor constraints for full free and open policy	full free and open data policy	Other	No Data
Albania	4	0	0	6	29	0	0
Austria	0	5	14	5	7	12	2
Bulgaria	4	2	0	9	14	0	11
Croatia	12	78	15	36	327	0	0
Cyprus	9	1	24	6	13	0	0
Czech Republic	1	0	0	9	4	0	2
Denmark	3	1	0	28	65	0	3
Estonia	0	1	0	49	0	0	2
Finland	4	0	0	9	1	0	1
France	0	0	0	1	38	0	0
Germany	2	0	0	0	0	0	0
Greece	1	1	0	0	1	0	0
Hungary	4	5	4	0	0	0	0
Iceland	7	0	0	3	17	3	8
Italy	17	7	24	15	70	47	87
Kosovo	0	0	0	0	0	0	8
Latvia	11	4	0	29	29	0	5
Liechtenstein	5	0	0	1	2	0	0
Lithuania	0	0	2	0	0	11	4
Luxembourg	0	4	0	13	55	0	237
Montenegro	0	0	3	0	0	0	13
Multicountry	0	4	0	10	9	0	0
Netherlands	0	1	0	3	4	0	1
Norway	1	5	0	33	0	0	0
Poland	4	0	0	2	13	0	0
Portugal	0	0	0	0	14	10	0
North Macedonia	0	25	0	12	1	0	0
Romania	4	0	0	18	2	0	3
Serbia	0	0	0	1	0	0	0
Slovakia	2	3	9	1	9	0	20
Slovenia	0	0	0	0	9	0	0
Spain	1	0	12	1	1	0	0
Sweden	3	0	0	0	13	0	1
Switzerland	3	49	0	119	0	0	173
Turkey	2	0	0	0	0	0	3
UK	7	0	0	8	0	0	0
UK - Northern Ireland	3	1	0	30	0	0	0

7.6.2 Costs

Country	Free	Not Free	Other	No Data
Albania	32	0	0	7
Austria	0	0	0	45
Bulgaria	0	0	11	18
Croatia	0	10	5	453
Cyprus	48	0	1	4
Czech Republic	8	2	6	0
Denmark	93	0	0	7
Estonia	0	0	0	52
Finland	10	1	3	1
France	0	0	0	39
Germany	0	2	0	0
Greece	1	0	0	2
Hungary	5	0	8	0
Iceland	3	0	4	31
Italy	48	0	0	219
Kosovo	0	0	0	8
Latvia	0	0	0	78
Liechtenstein	0	0	0	8
Lithuania	14	1	2	0
Luxembourg	0	0	0	309
Montenegro	2	0	0	14
Multicountry	23	0	0	0
Netherlands	6	2	0	1
Norway	25	1	12	1
Poland	12	4	2	1
Portugal	0	0	10	14
North Macedonia	0	0	0	38
Romania	0	0	1	26
Serbia	0	0	0	1
Slovakia	3	0	0	41
Slovenia	9	0	0	0
Spain	15	0	0	0
Sweden	13	0	3	1
Switzerland	0	0	0	344
Turkey	0	0	0	5
UK	10	4	1	0
UK - Northern Ireland	28	3	3	0

7.6.3 Proliferation in CLC instances

Country	Yes	No	Other	No Data
Albania	29	10	0	0
Austria	0	0	0	45
Bulgaria	24	5	0	0
Croatia	382	86	0	0
Cyprus	50	1	2	0
Czech Republic	16	0	0	0
Denmark	94	1	0	5
Estonia	0	50	0	2
Finland	10	0	4	1
France	0	0	0	39
Germany	0	0	2	0
Greece	2	0	1	0
Hungary	5	1	7	0
Iceland	20	7	1	10
Italy	63	3	6	195
Kosovo	0	0	0	8
Latvia	42	14	0	22
Liechtenstein	5	3	0	0
Lithuania	2	0	0	15
Luxembourg	0	13	0	296
Montenegro	0	0	0	16
Multicountry	23	0	0	0
Netherlands	8	0	0	1
Norway	26	13	0	0
Poland	15	0	4	0
Portugal	14	0	10	0
North Macedonia	25	13	0	0
Romania	0	27	0	0
Serbia	1	0	0	0
Slovakia	15	0	1	28
Slovenia	9	0	0	0
Spain	14	0	0	1
Sweden	13	3	0	1
Switzerland	1	3	0	340
Turkey	2	0	0	3
UK	8	0	0	7
UK - Northern Ireland	23	0	4	7

7.6.4 CORDA

Country	Available	Other	No Data
Albania	6	0	33
Austria	0	1	44
Bulgaria	0	29	0
Croatia	24	0	444
Cyprus	5	0	48
Czech Republic	1	0	15
Denmark	8	0	92
Estonia	7	0	45
Finland	0	0	15
France	0	0	39
Germany	1	0	1
Greece	0	0	3
Hungary	0	0	13
Iceland	0	0	38
Italy	9	26	232
Kosovo	0	0	8
Latvia	1	0	77
Liechtenstein	0	0	8
Lithuania	1	0	16
Luxembourg	14	0	295
Montenegro	0	0	16
Multicountry	22	0	1
Netherlands	0	0	9
Norway	0	39	0
Poland	5	0	14
Portugal	0	0	24
North Macedonia	0	0	38
Romania	0	0	27
Serbia	1	0	0
Slovakia	0	0	44
Slovenia	0	0	9
Spain	7	1	7
Sweden	0	0	17
Switzerland	9	0	335
Turkey	2	0	3
UK	0	0	15
UK - Northern Ireland	0	0	34

7.6.5 INSPIRE

Country	Available	Other	No Data
Albania	0	0	39
Austria	32	13	0
Bulgaria	4	17	8
Croatia	425	0	43
Cyprus	20	0	33
Czech Republic	2	0	14
Denmark	86	0	14
Estonia	13	32	7
Finland	9	0	6
France	0	30	9
Germany	0	0	2
Greece	0	0	3
Hungary	1	0	12
Iceland	0	0	38
Italy	9	26	232
Kosovo	8	0	0
Latvia	62	2	14
Liechtenstein	0	0	8
Lithuania	5	0	12
Luxembourg	214	1	94
Montenegro	0	0	16
Multicountry	0	0	23
Netherlands	2	0	7
Norway	15	0	24
Poland	0	12	7
Portugal	5	0	19
North Macedonia	0	0	38
Romania	26	0	1
Serbia	0	0	1
Slovakia	3	0	41
Slovenia	0	0	9
Spain	10	0	5
Sweden	6	0	11
Switzerland	328	0	16
Turkey	0	0	5
UK	0	0	15
UK - Northern Ireland	0	0	34