



INSPIRE

Infrastructure for Spatial Information in Europe

D2.8.III.4 Data Specification on Land Use – Draft Guidelines

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INSPIRE	Reference: D2.8.III.4_v2.9		
TWG-LU	Data Specification on <i>Land Use</i>	2012-02-23	Page II

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2.9	7, 8, 11	Redraft of 7_Quality, 8_Metadata, 11_Portrayal sections
2.9	Annexes B, C, D	Revision of annex B on uses cases Redraft of annex C on HILUCS providing mapping of new HILUCS with existing classification systems New annex D presenting HSRCL

INSPIRE	Reference: D2.8.III.4_v2.9		
TWG-LU	Data Specification on <i>Land Use</i>	2012-02-23	Page III

Foreword

How to read the document?

This document describes the “*INSPIRE data specification on Land Use – Guidelines*” version 2.9 as developed by the Thematic Working Group (TWG) *Land Use* using both natural and a conceptual schema language.

The data specification is based on a common template used for all data specifications and has been harmonised using the experience from the development of the Annex I data specifications.

This document provides guidelines for the implementation of the provisions laid down in the draft Implementing Rule for spatial data sets and services of the INSPIRE Directive.

This document includes two executive summaries that provide a quick overview of the INSPIRE data specification process in general, and the content of the data specification on *Land Use* in particular. We highly recommend that managers, decision makers, and all those new to the INSPIRE process and/or information modelling should read these executive summaries first.

The UML diagrams (in Chapter 5) offer a rapid way to see the main elements of the specifications and their relationships. The definition of the spatial object types, attributes, and relationships are included in the Feature Catalogue (also in Chapter 5). People having thematic expertise but not familiar with UML can fully understand the content of the data model focusing on the Feature Catalogue. Users might also find the Feature Catalogue especially useful to check if it contains the data necessary for the applications that they run. The technical details are expected to be of prime interest to those organisations that are/will be responsible for implementing INSPIRE within the field of *Land Use*.

The technical provisions and the underlying concepts are often illustrated by examples. Smaller examples are within the text of the specification, while longer explanatory examples and descriptions of selected use cases are attached in the annexes.

In order to distinguish the INSPIRE spatial data themes from the spatial object types, the INSPIRE spatial data themes are written in *italics*.

The document will be publicly available as a ‘non-paper’. It does not represent an official position of the European Commission, and as such cannot be invoked in the context of legal procedures.

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INSPIRE	Reference: D2.8.III.4_v2.9		
TWG-LU	Data Specification on <i>Land Use</i>	2012-02-23	Page IV

Interoperability of Spatial Data Sets and Services – General Executive Summary

The challenges regarding the lack of availability, quality, organisation, accessibility, and sharing of spatial information are common to a large number of policies and activities and are experienced across the various levels of public authority in Europe. In order to solve these problems it is necessary to take measures of coordination between the users and providers of spatial information. The Directive 2007/2/EC of the European Parliament and of the Council adopted on 14 March 2007 aims at establishing an Infrastructure for Spatial Information in the European Community (INSPIRE) for environmental policies, or policies and activities that have an impact on the environment.

INSPIRE will be based on the infrastructures for spatial information that are created and maintained by the Member States. To support the establishment of a European infrastructure, Implementing Rules addressing the following components of the infrastructure are being specified: metadata, interoperability of spatial data themes (as described in Annexes I, II, III of the Directive) and spatial data services, network services and technologies, data and service sharing, and monitoring and reporting procedures.

INSPIRE does not require collection of new data. However, after the period specified in the Directive¹ Member States have to make their data available according to the Implementing Rules.

Interoperability in INSPIRE means the possibility to combine spatial data and services from different sources across the European Community in a consistent way without involving specific efforts of humans or machines. It is important to note that “interoperability” is understood as providing access to spatial data sets through network services, typically via Internet. Interoperability may be achieved by either changing (harmonising) and storing existing data sets or transforming them via services for publication in the INSPIRE infrastructure. It is expected that users will spend less time and efforts on understanding and integrating data when they build their applications based on data delivered within INSPIRE.

In order to benefit from the endeavours of international standardisation bodies and organisations established under international law their standards and technical means have been utilised and referenced, whenever possible.

To facilitate the implementation of INSPIRE, it is important that all stakeholders have the opportunity to participate in specification and development. For this reason, the Commission has put in place a consensus building process involving data users, and providers together with representatives of industry, research and government. These stakeholders, organised through Spatial Data Interest Communities (SDIC) and Legally Mandated Organisations (LMO)², have provided reference materials, participated in the user requirement and technical³ surveys, proposed experts for the Data Specification Drafting Team⁴ and Thematic Working Groups⁵ and participated in the public stakeholder

¹ For all 34 Annex I,II and III data themes: within two years of the adoption of the corresponding Implementing Rules for newly collected and extensively restructured data and within 5 years for other data in electronic format still in use

² Number of SDICs and LMOs on 8/6/2011 was 461 and 249 respectively

³ Surveys on unique identifiers and usage of the elements of the spatial and temporal schema,

⁴ The Data Specification Drafting Team has been composed of experts from Austria, Belgium, Czech Republic, France, Germany, Greece, Italy, Netherlands, Norway, Poland, Switzerland, UK, and the European Environmental Agency

⁵ The Thematic Working Groups of Annex II and III themes have been composed of experts from Austria, Belgium, Bulgaria, Czech Republic, Denmark, Finland, France, Germany, Hungary, Ireland, Italy, Latvia, Netherlands, Norway, Poland, Romania, Slovakia, Spain, Sweden, Switzerland, Turkey, UK, the European Commission, and the European Environmental Agency

INSPIRE	Reference: D2.8.III.4_v2.9		
TWG-LU	Data Specification on <i>Land Use</i>	2012-02-23	Page V

consultations on draft versions of the data specifications. These consultations covered expert reviews as well as feasibility and fitness-for-purpose testing of the data specifications⁶.

This open and participatory approach was successfully used during the development of the data specification on Annex I data themes as well as during the preparation of the Implementing Rule on Interoperability of Spatial Data Sets and Services⁷ for Annex I spatial data themes.,

The development framework elaborated by the Data Specification Drafting Team aims at keeping the data specifications of the different themes coherent. It summarises the methodology to be used for the data specifications and provides a coherent set of requirements and recommendations to achieve interoperability. The pillars of the framework are five technical documents:

- The Definition of Annex Themes and Scope⁸ describes in greater detail the spatial data themes defined in the Directive, and thus provides a sound starting point for the thematic aspects of the data specification development.
- The Generic Conceptual Model⁹ defines the elements necessary for interoperability and data harmonisation including cross-theme issues. It specifies requirements and recommendations with regard to data specification elements of common use, like the spatial and temporal schema, unique identifier management, object referencing, a generic network model, some common code lists, etc. Those requirements of the Generic Conceptual Model that are directly implementable will be included in the Implementing Rule on Interoperability of Spatial Data Sets and Services.
- The Methodology for the Development of Data Specifications¹⁰ defines a repeatable methodology. It describes how to arrive from user requirements to a data specification through a number of steps including use-case development, initial specification development and analysis of analogies and gaps for further specification refinement.
- The “Guidelines for the Encoding of Spatial Data”¹¹ defines how geographic information can be encoded to enable transfer processes between the systems of the data providers in the Member States. Even though it does not specify a mandatory encoding rule it sets GML (ISO 19136) as the default encoding for INSPIRE.
- The “Guidelines for the use of Observations & Measurements and Sensor Web Enablement-related standards in INSPIRE Annex II and III data specification development” provides guidelines on how the “Observations and Measurements” standard (ISO 19156) is to be used within INSPIRE.

The structure of the data specifications is based on the “ISO 19131 Geographic information - Data product specifications” standard. They include the technical documentation of the application schema, the spatial object types with their properties, and other specifics of the spatial data themes using natural language as well as a formal conceptual schema language¹².

A consolidated model repository, feature concept dictionary, and glossary are being maintained to support the consistent specification development and potential further reuse of specification elements. The consolidated model consists of the harmonised models of the relevant standards from the ISO

⁶ For Annex II+III, the consultation phase lasted from 20 June to 21 October 2011.

⁷ Commission Regulation (EU) No 1089/2010 implementing Directive 2007/2/EC of the European Parliament and of the Council as regards interoperability of spatial data sets and services, published in the Official Journal of the European Union on 8th of December 2010.

⁸ http://inspire.jrc.ec.europa.eu/reports/ImplementingRules/DataSpecifications/D2.3_Definition_of_Annex_Themes_and_scope_v3.0.pdf

⁹ http://inspire.jrc.ec.europa.eu/reports/ImplementingRules/DataSpecifications/D2.5_v3.3.pdf

¹⁰ http://inspire.jrc.ec.europa.eu/reports/ImplementingRules/DataSpecifications/D2.6_v3.0.pdf

¹¹ http://inspire.jrc.ec.europa.eu/reports/ImplementingRules/DataSpecifications/D2.7_v3.2.pdf

¹² UML – Unified Modelling Language

INSPIRE	Reference: D2.8.III.4_v2.9		
TWG-LU	Data Specification on <i>Land Use</i>	2012-02-23	Page VI

19100 series, the INSPIRE Generic Conceptual Model, and the application schemas¹³ developed for each spatial data theme. The multilingual INSPIRE Feature Concept Dictionary contains the definition and description of the INSPIRE themes together with the definition of the spatial object types present in the specification. The INSPIRE Glossary defines all the terms (beyond the spatial object types) necessary for understanding the INSPIRE documentation including the terminology of other components (metadata, network services, data sharing, and monitoring).

By listing a number of requirements and making the necessary recommendations, the data specifications enable full system interoperability across the Member States, within the scope of the application areas targeted by the Directive. Once finalised (version 3.0), the data specifications are published as technical guidelines and provide the basis for the content of the Implementing Rule on Interoperability of Spatial Data Sets and Services¹⁴. The content of the Implementing Rule is extracted from the data specifications keeping in mind short- and medium-term feasibility as well as cost-benefit considerations. The requirements included in the Implementing Rule will be legally binding for the Member States according to the timeline specified in the INSPIRE Directive.

In addition to providing a basis for the interoperability of spatial data in INSPIRE, the data specification development framework and the thematic data specifications can be reused in other environments at local, regional, national and global level contributing to improvements in the coherence and interoperability of data in spatial data infrastructures.

¹³ Conceptual models related to specific areas (e.g. INSPIRE themes)

¹⁴ In the case of the Annex II+III data specifications, the extracted requirements will be used to formulate an amendment to the existing Implementing Rule.

INSPIRE	Reference: D2.8.III.4_v2.9		
TWG-LU	Data Specification on <i>Land Use</i>	2012-02-23	Page VII

Land Use – Executive Summary

Land Use is included in Annex III, which means that it is a specific thematic field. The INSPIRE data specification on Land Use has been prepared in view of following the participative principle of consensus building process. The stakeholders, based on their registration as a Spatial Data Interest Community (SDIC) or a Legally Mandated Organisation (LMO) had the opportunity to bring forward user requirements and reference materials, propose experts for the specification development and participated in the review and test of the data specifications.

The Thematic Working Group responsible for the Land Use specification development was composed of experts coming from Belgium, Finland, France, Germany, the Netherlands, Poland, Spain, and the European Commission. The specification process took place according to the methodology elaborated for INSPIRE respecting the requirements and the recommendation of the INSPIRE Generic Conceptual Model, which is one of the elements that ensures a coherent approach and cross-theme consistency with other themes in the Directive. Furthermore, use cases from other themes requiring Land Use data has been investigated. The analysis concluded that the proposed model for Land use meets the requirements. The consultation and testing have ascertained this statement as 395 comments were provided that have led to simplify and improve the data specification.

The cornerstone of the specification development was the fact that *Land use shapes our environment in positive and negative ways. Productive land is a critical resource for food and biomass production and land use strongly influences soil erosion and soil functions such as carbon storage. Land management largely determines the beauty of Europe's landscapes. It is important therefore to monitor land cover and land-use change*¹⁵.

In the INSPIRE directive, Land Use is defined as Territory characterised according to its current and future planned functional dimension or socio-economic purpose (e.g. residential, industrial, commercial, agricultural, forestry, recreational). [Directive 2007/2/EC] It is the description of land in terms of its socio-economic and ecological purpose. The inland water bodies as well as coastal waters are considered within the connected piece of land and planning of the use of sea and the use of seabed has been taken into consideration.

Land Use is itself split up into two different types:

1. The Existing Land Use (current land use in the above definition), which objectively depicts the use and functions of a territory as it has been and effectively still is in real life. Geographical data-sets that provide Land Use information, at the time of observation, are modeled according to three application schemas:
 - a. organized as a partition (in the mathematical sense) of a given area. Each element of the partition is homogeneous regarding the functional use of land. (ExistingLandUse application schema)
 - b. organized as a set of discrete observation points informing on the functional use at the exact location and/or at its surrounding at the time of observation, (SampledExistingLandUse application schema)
 - c. organized as a set of pixels informing on the functional use –GriddedExistingLandUse application schema and
2. The Planned Land Use or PLU (future planned land use in the above definition), which corresponds to spatial plans, defined by spatial planning authorities, depicting the possible utilization of the land in the future. Planned land use is regulated by spatial planning documents elaborated at various levels of administration. Land use regulation over a geographical area is in general composed of an overall strategic orientation, a textual regulation and a cartographic representation. Spatial planning documents result from the spatial planning process, once adopted and therefore which third parties must conform with. The scope of the INSPIRE Land Use Data Specification is giving the exact spatial dimension of all the elements a spatial plan is composed of. Planned Land Use application schema is mainly based on ZoningElement that depicts the zoning defined by spatial planners and

¹⁵ SOER Synthesis, 2010. The European environment — state and outlook 2010: synthesis. European Environment Agency, Copenhagen.

INSPIRE	Reference: D2.8.III.4_v2.9		
TWG-LU	Data Specification on <i>Land Use</i>	2012-02-23	Page VIII

Supplementary Regulation that enables to inform on regulations that superimpose on the zoning.

The Land Use data specification supports two systems of classification:

- the (obligatory) Hierarchical INSPIRE Land Use Classification System (HILUCS) which is a multi-level, classification system that will apply to both the existing and planned land use
- the (optional) specific classification system in use in a member state.

Land use has connexion with several other INSPIRE themes but it has been preferred not to include relationships with these themes in the model assuming that geometric functions of user information systems will enable to compute the spatial relationships. For example the inclusion of a feature from another theme in a Land use feature or the overlap between them can be recomputed with spatial analysis tools.

In the Land Use data specification the description of the use of land will not provide the description of the geographical objects as done in the other theme. For example, an area in which energy is produced will be seen as a unique object in a Land use datasets where in the Energy resource theme more detailed description of the plant may be provided including differentiation of its parts.

As stated by the INSPIRE directive, Land Use is different from Land Cover (LC, Annex II, theme number 2). The choice has been made to consider those two themes with different geometries.

Planned Land use information is often overlaid on cadastral maps or other background mapping such as orthoimagery. The choice has been made to allow the data provider to inform on the version of the background map which the spatial plan has been drawn over without implementing direct relationships with the corresponding theme as described in the INSPIRE Data Specification .

Planned land use incorporate elements that in the real world can be related to other INSPIRE spatial data themes (see Figure 1) such as Area management/restriction/regulation zones and reporting units (AM, Annex III theme 11) or Natural Risk Zones (NZ, annex III theme 12). These will be seen as supplementary regulation in the Land Use data model (planned land Use) as soon as this information is incorporated in the legal spatial plan, i.e. only information that is geographical and legally binding in the spatial plan will be considered as a supplementary regulation although it may belong to another theme.

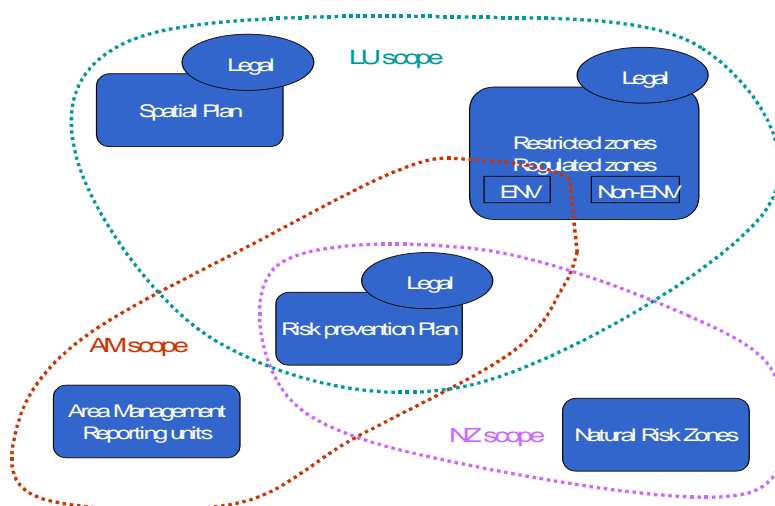


Figure 1: Relation of the land use theme with the area management and natural risk zone theme.

Comparable data on top of harmonised specification elements create additional value for achieving interoperability in INSPIRE. For this finality the data specification on Land Use includes recommendations on reporting data quality parameters.

INSPIRE	Reference: D2.8.III.4_v2.9		
TWG-LU	Data Specification on <i>Land Use</i>	2012-02-23	Page IX

Regardless whether these recommendations on data quality are met, the actual values of data quality elements should be published as metadata. These elements usually have to be published at the dataset level.

For visualisation purposes, simple rules for default portrayal are given by specifying the colour attached to classes of the Hierarchical INSPIRE Land Use Classification System.

The main value of the INSPIRE Land Use model is its simplicity, a yet flexible structure that allows data providers to publish their existing data in the most convenient way. It is expected that the on-going consultation and testing will help explaining how to implement this data specification including in how to use it for structure plans and construction plans.

INSPIRE	Reference: D2.8.III.4_v2.9		
TWG-LU	Data Specification on <i>Land Use</i>	2012-02-23	Page X

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INSPIRE	Reference: D2.8.III.4_v2.9		
TWG-LU	Data Specification on <i>Land Use</i>	2012-02-23	Page XI

Table of contents

1	Scope	1
2	Overview	1
2.1	Name	1
2.2	Informal description	1
2.2.1	Existing land use	2
2.2.2	Planned land use	4
2.3	Normative References	6
2.4	Terms and definitions	7
2.5	Symbols and abbreviations	8
2.6	Notation of requirements and recommendations	8
2.7	Conformance	9
3	Specification scopes	9
4	Identification information	9
5	Data content and structure	9
5.1	Basic notions	10
5.1.1	Stereotypes	10
5.1.2	Placeholder and candidate types	11
5.1.3	Voidable characteristics	11
5.1.4	Enumerations	12
5.1.5	Code lists	12
5.1.6	Coverages	14
5.2	Application schema Land Use	16
5.2.1	Description	16
5.2.2	Feature catalogue Land Use Nomenclature	37
5.2.3	Feature catalogue Existing Land Use	41
5.2.4	Feature catalogue Sampled Existing Land Use	46
5.2.5	Feature catalogue Gridded Existing Land Use	51
5.2.6	Feature catalogue Planned Land Use	53
5.2.7	INSPIRE-governed code lists	71
5.2.8	94
6	Reference systems	94
6.1	Coordinate reference systems	94
6.1.1	Datum	94
6.1.2	Coordinate reference systems	95
6.1.3	Display	95
6.1.4	Identifiers for coordinate reference systems	95
6.2	Temporal reference system	96
6.3	Theme-specific requirements and recommendations on reference systems	96
7	Data quality	96
7.1	Data quality elements	97
7.1.1	Completeness – Commission	98
7.1.2	Completeness – Omission	98
7.1.3	Logical consistency – Domain consistency	99
7.1.4	Positional accuracy – Absolute or external accuracy	100
7.1.5	Thematic accuracy – Classification correctness	101
7.1.6	Thematic accuracy – Non-quantitative attribute correctness	102
7.2	Minimum data quality requirements	102
7.3	Recommendation on data quality	102
8	Dataset-level metadata	103

INSPIRE	Reference: D2.8.III.4_v2.9		
TWG-LU	Data Specification on <i>Land Use</i>	2012-02-23	Page XII

8.1	Common metadata elements	103
8.1.1	Coordinate Reference System.....	105
8.1.2	Temporal Reference System	106
8.1.3	Encoding	107
8.1.4	Character Encoding	108
8.1.5	Data Quality – Logical Consistency – Topological Consistency.....	108
8.2	Metadata elements for reporting data quality	108
8.3	Theme-specific metadata elements	110
8.3.1	Maintenance Information	110
8.3.2	Spatial Resolution	111
8.3.3	Data Quality – Completeness - Commission.....	111
8.3.4	Data Quality – Completeness - Omission.....	112
8.3.5	Data Quality – Logical Consistency – Domain consistency	112
8.3.6	Data Quality – Positional accuracy – Absolute or external accuracy	112
8.3.7	Data Quality – Thematic accuracy – Classification correctness.....	112
8.4	Guidelines on using metadata elements defined in Regulation 1205/2008/EC	113
8.4.1	Conformity.....	113
8.4.2	Lineage	113
8.4.3	Temporal reference	114
8.4.4	Keywords	114
9	Delivery	115
9.1	Delivery medium	115
9.2	Encodings	115
9.2.1	Default Encoding(s)	115
9.2.2	Alternative Encoding(s).....	116
10	Data Capture.....	116
11	Portrayal.....	116
11.1	Layers to be provided by INSPIRE view services	117
11.1.1	Layers organisation.....	118
11.2	Styles to be supported by INSPIRE view services	118
11.2.1	Styles for the layer LandUse.ExistingLandUse	118
11.2.2	Styles for the layer LandUse.SpatialPlan.....	119
11.2.3	Styles for the layer LandUse.SupplementaryRegulation	121
	Bibliography	123
	Annex A (normative) Abstract Test Suite	124
	Annex B (informative) Use cases	125
B.1	Introduction	125
B.2	Land Planning	126
B.2.1	Narrative description	126
B.2.2	Involved actors.....	127
B.2.3	Detailed description	127
B.3	Analysis of land consumption	129
B.3.1	Narrative description	129
B.3.2	Involved actors.....	130
B.3.3	Detailed description	130
B.4	Ecological network map	131
B.4.1	Narrative description	131
B.4.2	Involved actors.....	133
B.4.3	Detailed description	133
B.5	Land use and land-use change and forestry for greenhouse inventory reporting	134
B.5.1	Narrative description	134
B.5.2	Involved actors.....	137
B.5.3	Detailed description	137

INSPIRE	Reference: D2.8.III.4_v2.9		
TWG-LU	Data Specification on <i>Land Use</i>	2012-02-23	Page XIII

B.6	Other use cases	138
B.6.1	Land use for environmental impact assessment	138
B.6.2	Land use for the flood directive.....	138
B.6.3	Statistics for land use.....	139
B.6.4	Land use for soil management	139
B.7	Existing land use data requirements.....	140
B.7.1	Features.....	141
B.7.2	Nomenclature.....	141
B.7.3	Temporal dimension	141
B.7.4	Quality control	142
B.7.5	Identifiers	142
B.7.6	Portrayal.....	142
B.7.7	Metadata	142
B.7.8	Consistency with other themes.....	142
B.7.9	Detailed user's assessment from HLANDATA project	142
B.8	Planned land use data requirements	143
B.8.1	Features.....	143
B.8.2	Nomenclature.....	144
B.8.3	Temporal dimension	144
B.8.4	Identifiers	144
B.8.5	Quality control	144
B.8.6	Portrayal.....	144
B.8.7	Metadata	145
B.8.8	Consistency with other themes.....	145
Annex C (informative)	Towards the Hierarchical INSPIRE Land Use nomenclature	146
C.1	Investigated classification systems.....	146
C.1.1	LUCAS (Land Use / Cover Area Frame Survey)	147
C.1.2	Urban Atlas	147
C.1.3	Plan4All.....	148
C.1.4	FR-CNIG – Plan local d’urbanisme – Plan d’occupation des sols.....	148
C.1.5	NL-BBG – Bestand Bodemgebruik.....	149
C.1.6	UK-National Land Use Database: Land Use and Land Cover Classification	149
C.1.7	US-LBCS (Land-Based Classification Standards).....	150
C.2	Conclusions.....	150
C.3	HILUCS	151
C.4	Mapping HILUCS with LUCAS, NACE, SEEA and Urban Atlas	151
C.5	HILUCS Frequently asked questions:.....	155
C.6	Mapping HILUCS with some specific classification systems	156
Annex D (informative)	Hierarchical Supplementary Regulation Code List.....	178
D.1	Introduction	178
D.2	Proposed Hierarchical Supplementary Regulation Code List (HSRCL)	179
D.3	Examples of mapping HSRCL with national coding systems	179
	• Mapping with CNIG (France) code list	179
	• Mapping with (Finland) code list	184
	• Mapping supplementary regulation in Germany with XPlanGML standard	187
	• Mapping supplementary regulation on structure plan level in Germany with XPlanGML standard	193
Annex E (informative)	Land use and Land Cover Relations	202
E.1	Land cover and land use definitions	202
E.2	Dependencies and consequences between land cover and land use.....	203
E.3	Land unit	203
Annex F (informative)	Proposed changes to D2.3 V3.0	206
F.1	Land use plans/land use regulation	206
F.2	Functional land use – according to socio-economic purpose	207
F.3	Scope, use examples.....	207

INSPIRE	Reference: D2.8.III.4_v2.9		
TWG-LU	Data Specification on <i>Land Use</i>	2012-02-23	Page XIV

F.4	Important feature types and attributes	208
F.5	Links and overlaps with other themes.....	208
F.6	Reference documents	209
Annex G (informative)	Ecological function of land	210
Annex H (informative)	Use of PLU model for strategic planning in Germany	211

INSPIRE	Reference: D2.8.III.4_v2.9		
TWG-LU	Data Specification on <i>Land Use</i>	2012-02-23	Page 1

1 Scope

This document specifies a harmonised data specification for the spatial data theme *Land Use* as defined in Annex III of the INSPIRE Directive.

This data specification provides the basis for the drafting of Implementing Rules according to Article 7 (1) of the INSPIRE Directive [Directive 2007/2/EC]. The entire data specification will be published as implementation guidelines accompanying these Implementing Rules.

2 Overview

2.1 Name

INSPIRE data specification for the theme Land Use.

2.2 Informal description

Definition:

Territory characterised according to its current and future planned functional dimension or socio-economic purpose (e.g. residential, industrial, commercial, agricultural, forestry, recreational). [Directive 2007/2/EC]

Description:

The definition of the INSPIRE spatial data theme 'Land Use' stresses two important parts of this theme:

First of all Land Use is defined as the **use** and **functions** of a territory. It is the description of land in terms of its socio-economic and ecological purpose. Land use is different from Land Cover (Annex III, theme number 3), dedicated to the description of the surface of the earth by its (bio-)physical characteristics. Land Cover and Land Use are, however, related and often combined in practical applications. Data sets combining Land Use and Land Cover often emphasize land use aspects in intensively used areas and land cover aspects in extensively used areas. An example of the difference in description of the same piece of land would be an agricultural area with grass. In Land Cover it would be described as a pasture (the cover of the land is grass), while in Land Use it would be classified as agriculture (its use would be for grazing cattle).

Secondly Land Use is itself split up into two different types (see table 1):

- The existing land use (current land use in the above definition), which objectively depicts the use and functions of a territory as it has been and effectively still is in real life. Existing land use will be modeled according to three application schemas:
 - The Existing Land Use or ELU composed of polygons,
 - The Sampled Existing Land Use or SELU which corresponds to the use and functions as observed around a set of locations sampled over a given area,
 - The Gridded Existing Land Use or GELU which correspond to a georeferenced gridded version of an existing land use dataset.
- The Planned Land Use or PLU (future planned land use in the above definition), which is composed of spatial plans, defined by spatial planning authorities, depicting the possible

utilization of the land in the future. The corresponding application schema contains either a vector data or a raster data.

	Existing Land Use	Planned Land Use
Polygons or vector data	ELU	PLU
Set of locations	SELU	
Raster data	GELU	PLU

Table 1 – different types of land use datasets and the corresponding application schemas

To accommodate the wide variety of spatial information that is already available on Land Use, the application schemas described in chapter 5 are as open ended as possible. They are based on a common aspect which can be applied for ELU, SELU, GELU and PLU, and supports two different systems of classification. First of all there is the **Hierarchical INSPIRE Land Use Classification System (HILUCS)**. This is a new, multi-level, classification system. It will be general enough for the member states to map their specific classification system to the appropriate level of HILUCS. This classification system will allow comparing the different data sets from different member states. It has been necessary to define HILUCS as no existing classification system was fulfilling the requirements for consistently describing existing and planned land use in Europe. The second possibility is to add the local classification system of the member state, or in the case of PLU, the authority issuing the plan. This local system should however be well documented, allowing users to use the data and compare it with datasets from other sources.

The scope of the theme Land Use does not only include the actual earth's surface (the use at ground level), but can also indicate which uses are directly below or above ground level, restricted to their physical impact at ground level. A mine for instance can be completely below the surface but still be the land use. Another example is a high rise set of buildings which includes shops on the ground floor and residences on the other floors.

In most cases human activities occur on areas that include the “infrastructures” necessary for the activity to take place (e.g. an industrial area includes the car-parks necessary for the staff and clients, gardens necessary for the “well fare”, warehouses for the stocks, front office – back office). The inland water bodies as well as coastal waters are considered within the connected piece of land as soon as they participate to the use or function of that connected piece of land, e.g. a harbour includes the water that is inside the harbour. More generally their use may be documented according to HILUCS.

Planning of the use of sea and the use of seabed has been taken into consideration. HILUCS is applicable although some further work is needed to construct the correspondence between HILUCS and the terminology used in this area of spatial planning.

2.2.1 Existing land use

Geographical data-sets that provide Land Use information, at the time of observation, are often organised as a partition (in the mathematical sense) of a given area (see Figure 2). They are called Existing Land Use (ELU). Each element of the partition (polygon) is homogeneous regarding the functional use of land. The fact that one land use is defined does not mean only one land use exists, the model will enable the possibility to also provide the other kinds of land use in the same area. The polygons do not overlap each other (i.e. “polygons” are mutually exclusive). The area covered by a Land Use data set may differ from the area managed by an authority. For example a local government may be responsible for the data set but the area covered by the data set may be smaller than the administrative boundaries of the local government or may have holes. That may be due to multiple reason including the data capture method (e.g. from imagery) or the legal context.

Geographical data-sets that provide Land Use information, at the time of observation, may also be organised as discrete set of points each of them being observed and associated with attributes describing the land use. It will be called Sampled Existing Land Use (SELU) (see Figure 3)

Gridded Existing Land Use (GELU) is a way of presenting existing land use in a raster form. (see Figure 4)

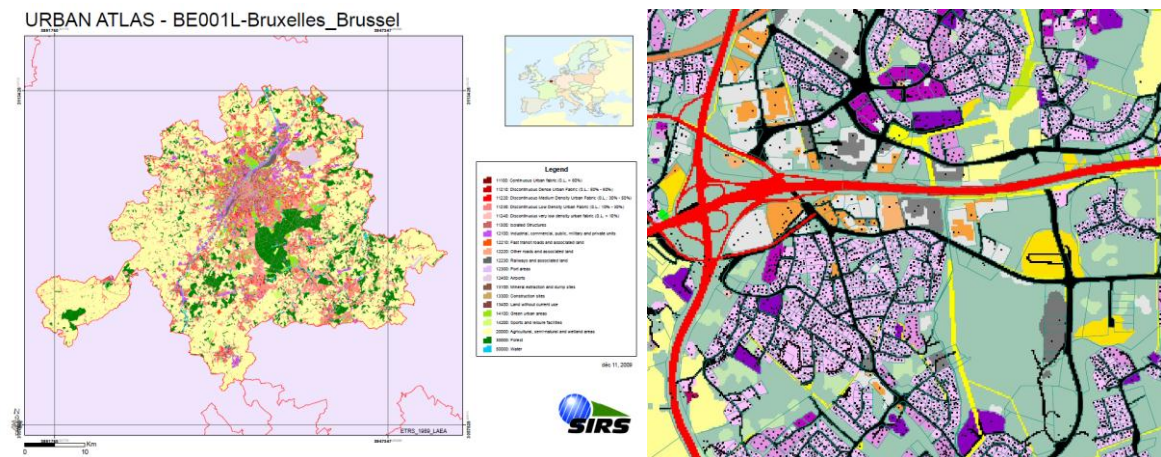


Figure 2 – example of existing land use datasets
left: Urban Atlas over Bruxelles, Belgium
right: Land Use over the city of Espoo, Finland

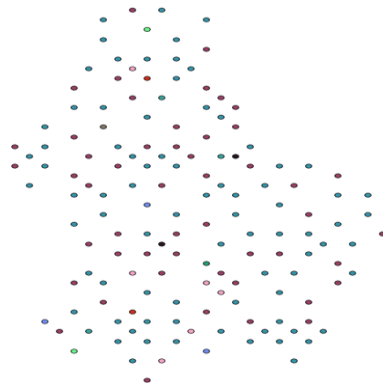


Figure 3 – example of sampled existing land use of LUCAS 2009 in Luxembourg

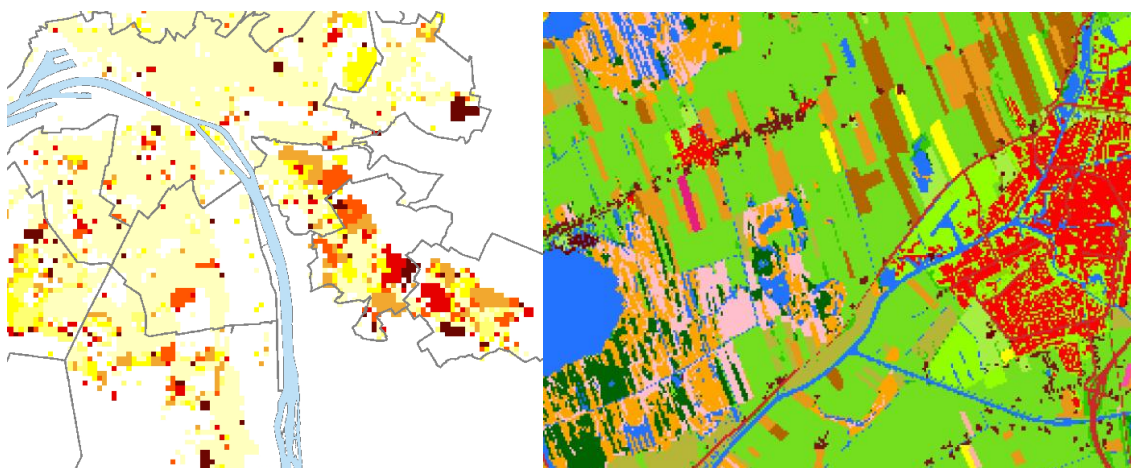


Figure 4 –examples of a gridded existing land use
left from the area of Rouen (France)
right from the Netherlands

INSPIRE	Reference: D2.8.III.4_v2.9		
TWG-LU	Data Specification on <i>Land Use</i>	2012-02-23	Page 4

A nomenclature provides the functional uses that are taken into consideration; many nomenclatures exist in the world today, from those applicable at continental level, to those defined locally. For the INSPIRE Land Use theme the new HILUCS classification system will be used (e.g. area used for primary production such as agriculture or forestry, for secondary production such as industrial areas, for transport networks, logistics or other basic infrastructure, for residential etc.).

Each separate dataset of Existing Land Use will be a snapshot of a certain moment in time, the added value of these separate datasets with different timestamps is the fact that Land Use changes over time can be monitored if they are put together.

Associated with the nomenclature, the minimum unit of interest (also called minimum mapping unit or observation unit) defines the level of detail within the dataset, i.e. the minimum size of the polygons or the minimum distance between observation points that are in the dataset. This information is provided within the metadata associated with the dataset.

2.2.2 Planned land use

In the context of INSPIRE, sharing land use information supports the requirements common in spatial planning. The spatial plans established at the various levels of administration need to be supported by other spatial plans made by public authorities at different levels or even with spatial plans across the border of a nation. Different zoning elements across borders can have a great influence on each other.

Planned land use is regulated by spatial planning documents elaborated at various levels of administration.

Land use regulation over a geographical area (spatial planning documents resulting from the spatial planning process, once adopted and therefore which third parties must conform with) is often composed of three parts:

- the overall strategic orientation that describes the development will of the competent administrative authority which is a textual document,
- the textual regulation that affects each zone and orientates the planned land use. It is composed of articles and dictates what is possible and impossible with regard to the use of land,
- the cartographic representation composed of elements that are binding (affecting the actual rights and constraints of cadastral parcels) or not binding (e.g. for illustration only).

Although the original planned Land Use documents are legally binding the derived INSPIRE dataset is not.

The scope of the INSPIRE Land Use Data Specification is giving the exact spatial dimension of all the elements a spatial plan is composed of. These elements can be based on other INSPIRE spatial data themes, like Cadastral Parcels, Area Management Zones or Natural Risk Zones. The main spatial objects of a spatial plan will be the zoning elements and the supplementary regulations that add regulations to the zoning elements. Additional information like the exact textual regulation will be linked to these objects.

Until now, no nomenclatures have been agreed on at an international level regarding planned land use. Like for the Existing Land Use the new HILUCS nomenclature will be mandatory to be used at the most appropriate level. But besides this mandatory classification system, any other system like the local system which is supposed to be well documented can also be added.

Spatial planning is performed at several governmental levels and the cartographic expression of the regulation differs in its graphical expression as well as the concepts that are represented. It is worth mentioning that due to the terms of the directive itself, the local governments being at the lower level of administration in any member state will have to make available their spatial plan only if a law imposes the responsibility on them to produce such spatial plans.

Below the illustrative description of structure plans – zoning plans – and constructions plans is an example reflecting the different levels of detail in which planned land use can be spatially represented. Other plan types may exist in the EU.

INSPIRE	Reference: D2.8.III.4_v2.9		
TWG-LU	Data Specification on <i>Land Use</i>	2012-02-23	Page 5

Plans on different administrative levels have different uses and therefore different values, but one is not better than the other. Structure plans give a different type of information as opposed to construction plans, more detail does not necessarily mean more value, especially when viewed on an European level. It is therefore important that plans on all levels can be exchanged using INSPIRE.

The area covered by a Planned Land Use data set may differ from the area managed by the local government responsible for. The area covered by the data set may be smaller than the administrative boundaries of the local government or may have holes. That may be due to multiple reason including the legal context.

Structure plans. At a level of a wide area (several thousands of km², i.e. a country, a state, or a region), spatial planning documents outline the spatial structures and development in pursuance of spatial planning goals (see Figure 5). All public bodies and planning authorities must ensure that planning and measures affecting spatial structures are strictly compliant with the spatial planning goals. In the INSPIRE context, they are seen as geographic information. The concepts cartographically represented include “areas losing attractiveness”, “areas that require controlled development”, “economic area of metropolitan importance”, “green heart”, “green belt around cities”, “peri-urban area with rural predominance”, “ecological corridors”, “liaison between ecological corridors” “limits and intensity of potential areas of urban expansion”, “reinforcement project of public transportation networks”. The cartographic expressions are not always binding when they are given for illustration only, although the textual parts are legally binding. In the INSPIRE context, these cartographic representation may be viewed as simple drawings, being either raster or vector. In case of legally binding georeferenced Structure Plans, it could be also implemented as any other spatial plan with its Zoning Elements, Supplementary Regulations and Official Documentation. Some suggestions on how structure plans can be modelled is given in Annex H (based on testing reports).

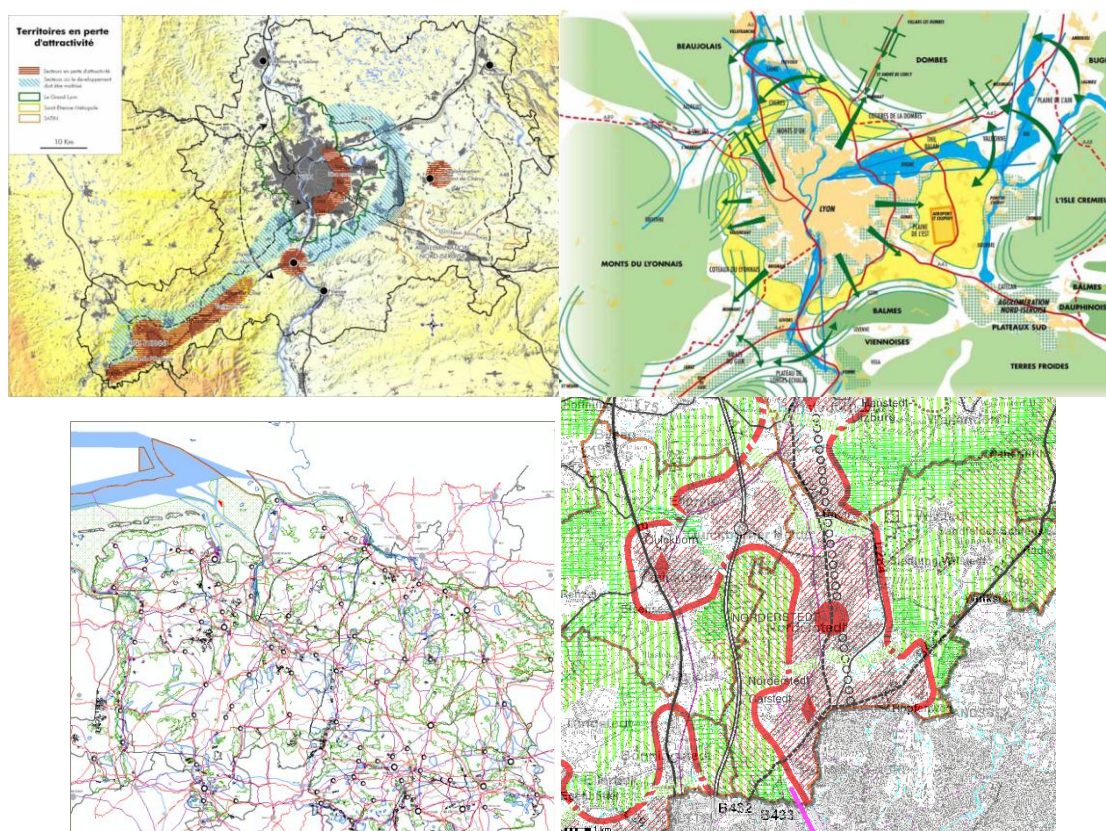


Figure 5 – examples of cartographic representation of planned Land use for a wide area
Top: Directive territoriale d'aménagement du département du Rhône

Bottom: spatial structure plan of the federal state “Lower Saxony” and part of a regional plan in the federal state “Schleswig Holstein”

Zoning Plans. At a level of a municipality or group of municipalities (i.e. several hundred of km²), the concepts cartographically represented includes the zoning and supplementary regulations (such as easements) (see Figure 6). Zoning refers to a partition where the planned land use is depicted. To each polygon are attached articles of the regulation that explicit the rights and prohibitions regarding new constructions or modification to existing constructions. Supplementary regulations overlap the zoning where it exists and provide additional information and/or limitations to the development of the area. The supplementary regulations can be for spatial planning reasons, or due to the need to formalise external regulations. They affect the constructability of cadastral parcels and therefore have “well-defined” boundaries. In the INSPIRE context, they are seen as geographic information.

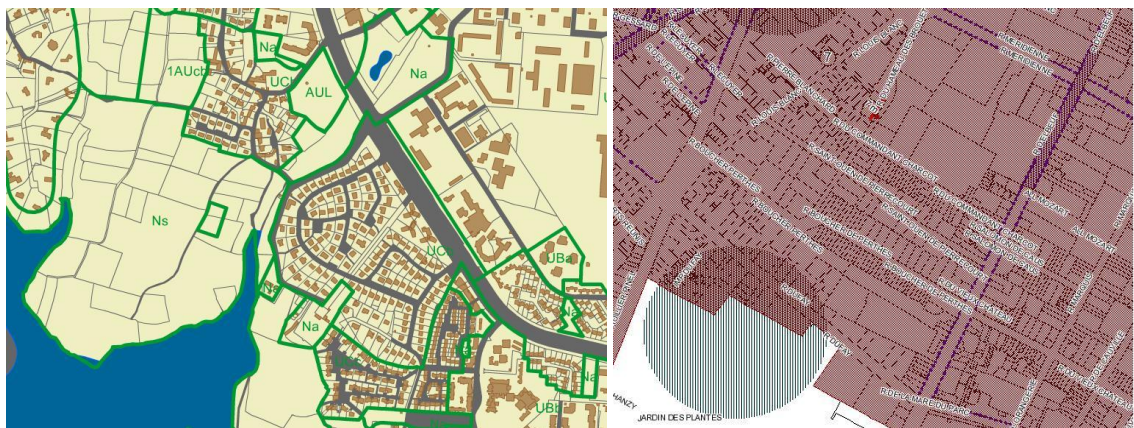


Figure 6 –examples of cartographic representation of zoning and supplementary regulations
left: Green lines represent the zoning overlaid on cadastre
right: Supplementary regulations overlaid on cadastre and zoning

Construction Plans. At a development area level (i.e. few km²) the concept cartographically represented are the actual geographical objects that will be created such as building, parking lots, gardens (see Figure 7). This detailed level is not really necessary to be exchanged on a European level, but may be exchanged between public authorities at a local level, perhaps even across borders of member states. In the INSPIRE context, they may be seen as geographic information or as simple drawings.



Figure 7 – examples of cartographic representation of planned development area

2.3 Normative References

INSPIRE	Reference: D2.8.III.4_v2.9		
TWG-LU	Data Specification on <i>Land Use</i>	2012-02-23	Page 7

[Directive 2007/2/EC] Directive 2007/2/EC of the European Parliament and of the Council of 14 March 2007 establishing an Infrastructure for Spatial Information in the European Community (INSPIRE)

[ISO 19107] EN ISO 19107:2005, Geographic Information – Spatial Schema

[ISO 19108] EN ISO 19108:2005, Geographic Information – Temporal Schema

[ISO 19108-c] ISO 19108:2002/Cor 1:2006, Geographic Information – Temporal Schema, Technical Corrigendum 1

[ISO 19111] EN ISO 19111:2007 Geographic information - Spatial referencing by coordinates (ISO 19111:2007)

[ISO 19113] EN ISO 19113:2005, Geographic Information – Quality principles

[ISO 19115] EN ISO 19115:2005, Geographic information – Metadata (ISO 19115:2003)

[ISO 19118] EN ISO 19118:2006, Geographic information – Encoding (ISO 19118:2005)

[ISO 19123] EN ISO 19123:2007, Geographic Information – Schema for coverage geometry and functions

[ISO 19135] EN ISO 19135:2007 Geographic information – Procedures for item registration (ISO 19135:2005)

[ISO 19138] ISO/TS 19138:2006, Geographic Information – Data quality measures

[ISO 19139] ISO/TS 19139:2007, Geographic information – Metadata – XML schema implementation

[OGC 06-103r3] Implementation Specification for Geographic Information - Simple feature access – Part 1: Common Architecture v1.2.0

NOTE This is an updated version of "EN ISO 19125-1:2006, Geographic information – Simple feature access – Part 1: Common architecture". A revision of the EN ISO standard has been proposed.

[Regulation 1205/2008/EC] Regulation 1205/2008/EC implementing Directive 2007/2/EC of the European Parliament and of the Council as regards metadata

2.4 Terms and definitions

General terms and definitions helpful for understanding the INSPIRE data specification documents are defined in the INSPIRE Glossary¹⁶.

Specifically, for the theme Land Use, the following terms are defined: (delete if no additional terms are defined)

(1) Coverage

¹⁶ The INSPIRE Glossary is available from <http://inspire-registry.jrc.ec.europa.eu/registers/GLOSSARY>

INSPIRE	Reference: D2.8.III.4_v2.9		
TWG-LU	Data Specification on <i>Land Use</i>	2012-02-23	Page 8

Any data representation that assigns values (attributes) directly to a spatial position with regard to spatial, temporal or spatiotemporal aspects. In this data specification coverage is a **continuous coverage** which maps direct spatial positions to value records (i.e. raster data that has been georeferenced).

(2) **Easements**

Rights to use someone else's land for a public utility specified purpose

(3) **Existing Land Use**

An objective depiction of the use and functions of a territory as it has been and effectively still is in real life.

(4) **Gridded Existing Land Use**

An objective depiction as a regular /rectified grid (image) of the use and functions of a territory as it has been and effectively still is in real life.

(5) **HILUCS**

Hierarchical INSPIRE Land Use Classification System; A multi-level classification system for Land Use; its use is mandatory at least for the first level of hierarchy.

(6) **Minimum Unit of Interest**

The smallest size of the land use objects taken into consideration in the dataset.

(7) **Planned Land Use**

Spatial plans, defined by spatial planning authorities, depicting the possible utilization of the land in the future.

(8) **Sampled Existing Land Use**

An objective depiction of the use and functions of a territory as it has been and effectively still is in real life as observed in sampled location.

(9) **Supplementary regulations**

Geographic features providing supplementary information and/or limitation of the use of land. The supplementary regulations can be for spatial planning reasons or due to the need to formalise external regulations.

(10) **Zoning**

A partition where the planned land use is depicted. To each polygon articles of the regulation are attached that explicit the rights and prohibitions regarding new constructions

NOTE "Zoning is an important component of land-use planning. It commonly includes regulation of the kinds of activities which will be acceptable on particular lots (such as open spaces, residential, agricultural, commercial or industrial), the densities at which those activities can be performed, the amount of space structures may occupy, etc." : Spatial development glossary European Conference of Ministers responsible for Spatial/Regional Planning (CEMAT), <http://www.coe.int/t/dg4/cultureheritage/heritage/cemat/VersionGlossaire/Bilingue-en-fr.pdf>

2.5 Symbols and abbreviations

2.6 Notation of requirements and recommendations

To make it easier to identify the mandatory requirements and the recommendations for spatial data sets in the text, they are highlighted and numbered.

INSPIRE	Reference: D2.8.III.4_v2.9		
TWG-LU	Data Specification on <i>Land Use</i>	2012-02-23	Page 9

IR Requirement X Requirements that are reflected in the Implementing Rule on interoperability of spatial data sets and services are shown using this style.

TG Requirement X Requirements that are not reflected in the Implementing Rule on interoperability of spatial data sets and services are shown using this style.

Recommendation X Recommendations are shown using this style.

2.7 Conformance

TG Requirement 1 Any dataset claiming conformance with this INSPIRE data specification shall pass the requirements described in the abstract test suite presented in Annex A.

3 Specification scopes

This data specification has only one scope, the general scope.

4 Identification information

NOTE Since the content of this chapter was redundant with the overview description (section 2) and executive summary, it has been decided that this chapter will be removed in v3.0.

5 Data content and structure

- This data specification defines the following application schemas:
- The Existing Land Use application schema
- The Sampled Existing Land Use application schema

The Gridded Existing Land Use application schema

The Planned Land Use application schema

IR Requirement 1 Spatial data sets related to the theme Land Use shall be made available using the spatial object types and data types specified in the following application schemas: Existing Land Use, Sampled Existing Land Use, Gridded Existing Land Use, Planned Land Use

These spatial object types and data types shall comply with the definitions and constraints and include the attributes and association roles defined in this section.

Recommendation 1 The reason for a void value should be provided where possible using a listed value from the VoidValueReason code list to indicate the reason for the missing value.

NOTE The application schema specifies requirements on the properties of each spatial object including its multiplicity, domain of valid values, constraints, etc. All properties have to be reported, if the relevant information is part of the data set. Most properties may be reported as “void”, if the data set does not include relevant information. See the Generic Conceptual Model [DS-D2.5] for more details.

In addition to the application schemas listed in IR Requirement 1, additional application schemas have been defined for the theme *Land Use*. These additional application schemas typically address requirements from specific (groups of) use cases and/or may be used to provide additional information. They are included in this specification in order to improve interoperability also for these additional aspects.

5.1 Basic notions

This section explains some of the basic notions used in the INSPIRE application schemas. These explanations are based on the GCM [DS-D2.5].

5.1.1 Stereotypes

In the application schemas in this sections several stereotypes are used that have been defined as part of a UML profile for use in INSPIRE [DS-D2.5]. These are explained in Table 1 below.

Table 1 – Stereotypes (adapted from [DS-D2.5])

Stereotype	Model element	Description
applicationSchema	Package	An INSPIRE application schema according to ISO 19109 and the Generic Conceptual Model.
leaf	Package	A package that is not an application schema and contains no packages.
featureType	Class	A spatial object type.
placeholder	Class	A class that acts as a placeholder for a class, typically a spatial object type, that will be specified in the future as part of another spatial data theme. The class should at least have a definition, but may otherwise have a preliminary or no specification (see section 5.1.2).
type	Class	A conceptual, abstract type that is not a spatial object type.
dataType	Class	A structured data type without identity.
union	Class	A structured data type without identity where exactly one of the properties of the type is present in any instance.

enumeration	Class	A fixed list of valid identifiers of named literal values. Attributes of an enumerated type may only take values from this list.
codeList	Class	A code list.
import	Dependency	The model elements of the supplier package are imported.
voidable	Attribute, association role	A voidable attribute or association role (see section 5.1.3).
lifeCycleInfo	Attribute, association role	If in an application schema a property is considered to be part of the life-cycle information of a spatial object type, the property shall receive this stereotype.
version	Association role	If in an application schema an association role ends at a spatial object type, this stereotype denotes that the value of the property is meant to be a specific version of the spatial object, not the spatial object in general.

5.1.2 Placeholder and candidate types

Some of the INSPIRE Annex I data specifications (which were developed previously to the Annex II+III data specifications) refer to types that were considered to thematically belong and which were expected to be fully specified in Annex II or III spatial data themes. Two kinds of such types were distinguished:

- *Placeholder types* were created as placeholders for types (typically spatial object types) that were to be specified as part of a future spatial data theme, but which was already used as a value type of an attribute or association role in this data specification.

Placeholder types received the stereotype «placeholder» and were placed in the application schema package of the future spatial data theme where they thematically belong. For each placeholder, a definition was specified based on the requirements of the Annex I theme. The Annex II+III TWGs were required to take into account these definitions in the specification work of the Annex II or III theme.

If necessary, the attributes or association roles in the Annex I data specification(s) that have a placeholder as a value type shall be updated.

- *Candidate types* were types (typically spatial object types) for which already a preliminary specification was given in the Annex I data specification. Candidate types did not receive a specific stereotype and were placed in the application schema package of the future spatial data theme where they thematically belong. For each candidate type, a definition and attributes and association roles were specified based on the requirements of the Annex I theme. The Annex II+III TWGs were required to take into account these specifications in the specification work of the Annex II or III theme.

If the type could not be incorporated in the Annex II or III data specification according to its preliminary specification, it should be moved into the application schema of the Annex I theme where it had first been specified. In this case, the attributes or association roles in the Annex I data specification(s) that have the type as a value type shall be updated if necessary.

NOTE Once the Annex II+III data specifications have been finalised by the TWGs (version 3.0), all placeholders and candidate types should have been removed. In some cases, this may require one or several of the Annex I data specifications (and the Implementing Rule on interoperability of spatial data sets and services) to be updated.

5.1.3 Voidable characteristics

INSPIRE	Reference: D2.8.III.4_v2.9		
TWG-LU	Data Specification on <i>Land Use</i>	2012-02-23	Page 12

If a characteristic of a spatial object is not present in the spatial data set, but may be present or applicable in the real world, the property shall receive this stereotype.

If and only if a property receives this stereotype, the value of *void* may be used as a value of the property. A *void* value shall imply that no corresponding value is contained in the spatial data set maintained by the data provider or no corresponding value can be derived from existing values at reasonable costs, even though the characteristic may be present or applicable in the real world.

It is possible to qualify a value of void in the data with a reason using the VoidValueReason type. The VoidValueReason type is a code list, which includes the following pre-defined values:

- *Unpopulated*: The characteristic is not part of the dataset maintained by the data provider. However, the characteristic may exist in the real world. For example when the “elevation of the water body above the sea level” has not been included in a dataset containing lake spatial objects, then the reason for a void value of this property would be ‘Unpopulated’. The characteristic receives this value for all objects in the spatial data set.
- *Unknown*: The correct value for the specific spatial object is not known to, and not computable by the data provider. However, a correct value may exist. For example when the “elevation of the water body above the sea level” of a *certain lake* has not been measured, then the reason for a void value of this property would be ‘Unknown’. This value is applied on an object-by-object basis in a spatial data set.

NOTE It is expected that additional reasons will be identified in the future, in particular to support reasons / special values in coverage ranges.

The «voidable» stereotype does not give any information on whether or not a characteristic exists in the real world. This is expressed using the multiplicity:

- If a characteristic may or may not exist in the real world, its minimum cardinality shall be defined as 0. For example, if an Address may or may not have a house number, the multiplicity of the corresponding property shall be 0..1.
- If at least one value for a certain characteristic exists in the real world, the minimum cardinality shall be defined as 1. For example, if an Administrative Unit always has at least one name, the multiplicity of the corresponding property shall be 1..*.

In both cases, the «voidable» stereotype can be applied. A value (the real value or void) only needs to be made available for properties that have a minimum cardinality of 1.

5.1.4 Enumerations

Enumerations are modelled as classes in the application schemas. Their values are modelled as attributes of the enumeration class using the following modelling style:

- No initial value, but only the attribute name part, is used.
- The attribute name conforms to the rules for attributes names, i.e. is a lowerCamelCase name. Exceptions are words that consist of all uppercase letters (acronyms).

IR Requirement 2 Attributes of spatial object types or data types whose type is an enumeration shall only take values included in the enumeration.

5.1.5 Code lists

Code lists are modelled as classes in the application schemas. Their values, however, are managed outside of the application schema.

5.1.5.1 Obligation

INSPIRE	Reference: D2.8.III.4_v2.9		
TWG-LU	Data Specification on <i>Land Use</i>	2012-02-23	Page 13

For each attribute that has a code list as its value, a tagged value called “obligation” is specified to define the level of obligation to use values from the list. The tagged value can take the following values:

- *IR* means that only the values defined by the code list shall be used for the attribute. This obligation is also included in the Implementing Rule on interoperability of spatial data and services.
- *TG* means that only the values defined by the code list should be used for the attribute. This obligation is *not* included in the Implementing Rule on interoperability of spatial data and services.

IR Requirement 3 Attributes of spatial object types or data types whose type is a code list with an “obligation” value of “IR” shall only take values that are valid according to the code list’s specification.

Recommendation 2 Attributes of spatial object types or data types whose type is a code list with an “obligation” value of “TG” should only take values that are valid according to the code list’s specification.

5.1.5.2. Governance

The following two types of code lists are distinguished in INSPIRE:

- *Code lists that are governed by INSPIRE (INSPIRE-governed code lists).* These code lists will be managed centrally in the INSPIRE code list register, which is managed and governed by the INSPIRE expert group on maintenance and implementation. Change requests to these code lists (e.g. to add, deprecate or supersede values) are processed and decided upon using the maintenance workflows defined by the INSPIRE expert group.

INSPIRE-governed code lists will be made available in the INSPIRE code list register at <http://inspire.ec.europa.eu/codeList/<CodeListName>>. They will be available in SKOS/RDF, XML and HTML. The maintenance will follow the procedures defined in ISO 19135. This means that the only allowed changes to a code list are the addition, deprecation or supersession of values, i.e. no value will ever be deleted, but only receive different statuses (valid, deprecated, superseded). Identifiers for values of INSPIRE-governed code lists are constructed using the pattern <http://inspire.ec.europa.eu/codeList/<CodeListName>/<value>>.

- *Code lists that are governed by an organisation outside of INSPIRE (externally governed code lists).* These code lists are managed by an organisation outside of INSPIRE, e.g. the World Meteorological Organization (WMO) or the World Health Organization (WHO). Change requests to these code lists follow the maintenance workflows defined by the maintaining organisations. Note that in some cases, no such workflows may be formally defined.

The tables describing externally governed code lists in this section contain the following columns:

- The *Governance* column describes the external organisation that is responsible for maintaining the code list.
- If the code list is versioned, the *Version* column specifies which version of the code list shall be used in INSPIRE. The version can be specified using a version number or the publication date of a version. The specification can also refer to the “latest available version”.
- The *Availability* column specifies from where the values of the externally governed code list are available, through a URL for code lists that are available online, or a citation for code lists that are only available offline.
- In the *Formats* column the formats are listed, in which a code list is available. These can be machine-readable (e.g. SKOS/RDF, XML) or human-readable (e.g. HTML, PDF).
- In some cases, for INSPIRE only a subset of an externally governed code list is relevant. The subset is specified using the *Subset* column.

INSPIRE	Reference: D2.8.III.4_v2.9		
TWG-LU	Data Specification on <i>Land Use</i>	2012-02-23	Page 14

- For encoding values of externally governed code lists, rules have to be specified for generating URI identifiers and labels for code list values. These are specified in a separate table.

5.1.5.3. Vocabulary

For each code list, a tagged value called “vocabulary” is specified to define a URI identifying the values of the code list. For INSPIRE-governed code lists and externally governed code lists that do not have a persistent identifier, the URI is constructed following the pattern *http://inspire.ec.europa.eu/codeList/<UpperCamelCaseName>*.

If the value is missing or empty, this indicates an empty code list. If no sub-classes are defined for this empty code list, this means that any code list may be used that meets the given definition.

An empty code list may also be used as a super-class for a number of specific code lists whose values may be used to specify the attribute value. If the sub-classes specified in the model represent all valid extensions to the empty code list, the subtyping relationship is qualified with the standard UML constraint “{complete,disjoint}”.

5.1.5.4. Extensibility

For each code list, a tagged value called “extensibility” is specified to define which additional values (other than those explicitly specified) are allowed as valid values of the code list. The tagged value can take the following values:

- *none* means that only the values explicitly specified shall / should¹⁷ be used for the attribute.
- *narrower* means that only the values explicitly specified or values narrower than the specified values shall / should be used for the attribute.
- *any* means that, in addition to the values explicitly specified, any other value may be used.

NOTE Additional values may only be used for categories that are not already covered by any of the existing values.

EXAMPLE A code list for types of area management zones with the extensibility “any” defines the following values:

- areasForTheDumpingOfWaste
- bathingWaters
- drinkingWaterProtectionArea
- floodManagementUnit

This code list may be extended with the value noiseRestrictionZone (which is not covered by any of the existing values), but not with a value landFill (which would be covered by the existing value areasForTheDumpingOfWaste).

NOTE The “extensibility” tagged value does *not* affect the possibility to update the code list values following the formal maintenance procedure. For example, even for code lists, for which the “extensibility” is set to *none*, it is still possible to add values following the maintenance procedure of the code list. As a result of this update, the code list may include additional valid values, and these additional may be used for attributes having the code list as a type.

5.1.6 Coverages

Coverage functions are used to describe characteristics of real-world phenomena that vary over space and/or time. Typical examples are temperature, elevation, precipitation, imagery. A coverage contains a set of such values, each associated with one of the elements in a spatial, temporal or spatio-

¹⁷ It depends on the level of the “obligation” tagged value on the attribute, whether this is a requirement or recommendation.

temporal domain. Typical spatial domains are point sets (e.g. sensor locations), curve sets (e.g. contour lines), grids (e.g. orthoimages, elevation models), etc.

In INSPIRE application schemas, coverage functions are defined as properties of spatial object types where the type of the property value is a realisation of one of the types specified in ISO 19123.

To improve alignment with coverage standards on the implementation level (e.g. ISO 19136 and the OGC Web Coverage Service) and to improve the cross-theme harmonisation on the use of coverages in INSPIRE, an application schema for coverage types is included in the Generic Conceptual Model in 9.9.4. This application schema contains the following coverage types:

- *RectifiedGridCoverage*: coverage whose domain consists of a rectified grid – a grid for which there is an affine transformation between the grid coordinates and the coordinates of a coordinate reference system (see Figure 8, left).
- *ReferenceableGridCoverage*: coverage whose domain consists of a referenceable grid – a grid associated with a transformation that can be used to convert grid coordinate values to values of coordinates referenced to a coordinate reference system (see Figure 8, right).
- *MultiTimeInstantCoverage*: coverage providing a representation of the time instant/value pairs, i.e. time series (see Figure 9).

Where possible, only these coverage types (or a subtype thereof) are used in INSPIRE application schemas.

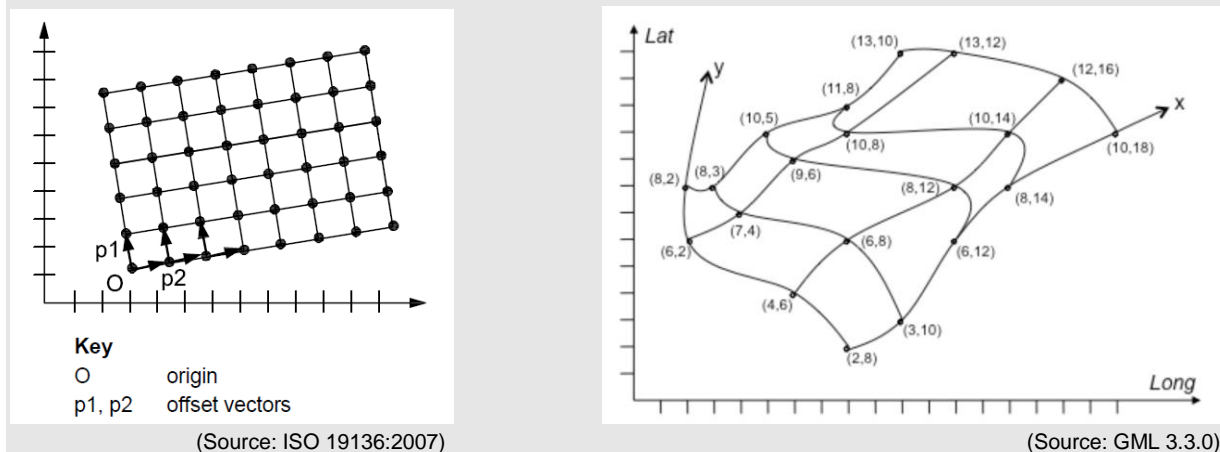


Figure 8 – Examples of a rectified grid (left) and a referenceable grid (right)

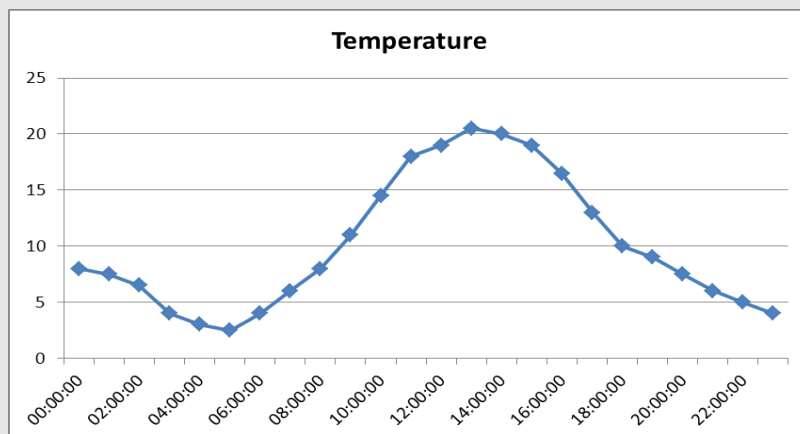


Figure 9 – Example of a MultiTimeSeriesCoverage (a time series)

INSPIRE	Reference: D2.8.III.4_v2.9		
TWG-LU	Data Specification on <i>Land Use</i>	2012-02-23	Page 16

Conceptually the LandUse theme has a coverage component expressing the partition of a given area but technology is not yet fully operational and user community not yet prepared to use coverages. Therefore it is recommended when the coverage technology will be widely implemented in operational tools to provide Land use data according to coverages. In the meanwhile it is recommended to use a set of polygons with the constraint that these polygons do not overlap.

Recommendation 3 The use of coverage for Land Use dataset will be recommended once the technology is mature and implemented in operational tools.

5.2 Application schema Land Use

5.2.1 Description

5.2.1.1. Narrative description and UML overview

There is a multitude of different ways to describe land use. This is partly due to the wide range of aspects of the functional use of land embraced by land use, partly due to the versatility of the land use data, and partly due to the confusion between land use and land cover in existing datasets. There is only one "real world" but many different descriptions of this world circulate (depending on the aims, methodology and terminology of the observer). A common application schema cannot support all uses across all computer environments.

Therefore many, sometimes incompatible, ways of describing land use will continue to exist. Land use classification starts from a universe of discourse – “the real world”. This universe is analyzed according to a set of rules regarding the functional dimension of the land and water in terms of the economic activities in order to establish a classification system. A selected list of classes, also named LUTypes (possibly parameterized) from the classification system, generates a nomenclature (analogous to a Feature catalogue) as part of any particular Application schema.

Different classification systems can be matched and compared when they are well documented.

The solution used in this INSPIRE data specification is therefore to create an application schema (named Land Use) that defines feature types but is as open ended as possible with respect to particular classification systems. This approach assures that a wide range of data based on different land use classification systems can co-exist in INSPIRE, as long as these systems are sufficiently well documented. The application schema provides mechanisms to document several classification systems. In order to allow progress in the area of semantic interoperability, i.e. the capacity to compare datasets natively connected to various classification systems, the application schema proposes a hierarchical INSPIRE Land Use classification system (HILUCS), general enough to allow any Land Use feature to be linked to a Land use type from the classification system. This applies to all land use datasets. This HILUCS is hierarchical in order to allow semantic generalisation and flexibility.

The Land Use theme is itself split up into four application schemas according to their temporal reference and definition (see Table 2):

- The existing land use (current land use in the INSPIRE definition), which objectively depicts the use and functions of a territory as it has been and effectively still is in real life. Existing land use will be modelled according to three forms:
 - The Existing Land Use or ELU composed of polygons which objectively depicts the use and functions of a territory as it has been and effectively still is in real life.
 - The Sampled Existing Land Use or SELU which corresponds to the use and functions as observed around a set of locations sampled over a given area.
 - The Gridded Existing Land Use or GELU which correspond to a geo-referenced gridded version of an existing land use dataset.
- The Planned Land Use or PLU (Future Planned Land Use in the INSPIRE definition), which is composed of spatial plans, defined by spatial planning authorities, depicting the possible utilization of the land in the future. This information could be modelled either as polygons, lines and points or as raster data.

			Temporal reference	
			Existing Land Use	Planned Land Use
Geometry	Vector data	Polygons	ELU	
		Polygons, lines, points		PLU
		Points	SELU	
	Raster data		GELU	PLU

Table 2 – Classification of the Land Use application schemas according to their temporal reference and geometry definition

For building the Land Use application schemas, common aspects are first defined for Land Use, it includes the HILUCS principles (see section 5.2.1.1.1). These common aspects are then applied for the description of the existing land use application schema (present or past) (see section 5.2.1.1.2), the sampled existing land use application schema (see section 5.2.1.1.3), the gridded existing land use application schema (see section 5.2.1.1.4) and the planned land use application schema (see section 5.2.1.1.5).

5.2.1.1.1. Common aspects

The common aspects for Land Use corresponds to a Land Use dataset that covers an area and provides a partition of that area with polygons that are mutually exclusive or with pixels (see Figure 10). The area covered by a Land Use data set may differ from the area managed by an authority due to multiple reasons including the data capture method (e.g. from imagery) or the legal context. The common aspects are also valid for a Land Use dataset that provide Land use information attached to a discrete set of location (samples) as shown in Figure 10. These polygons and locations are described by a land use category.

The covered area can be irregularly shaped and multipart. The covered area of a dataset, also called extent, is defined depending on the dataset type and form. It is defined as the boundary of the geometrical union of all the land use objects present in the dataset.

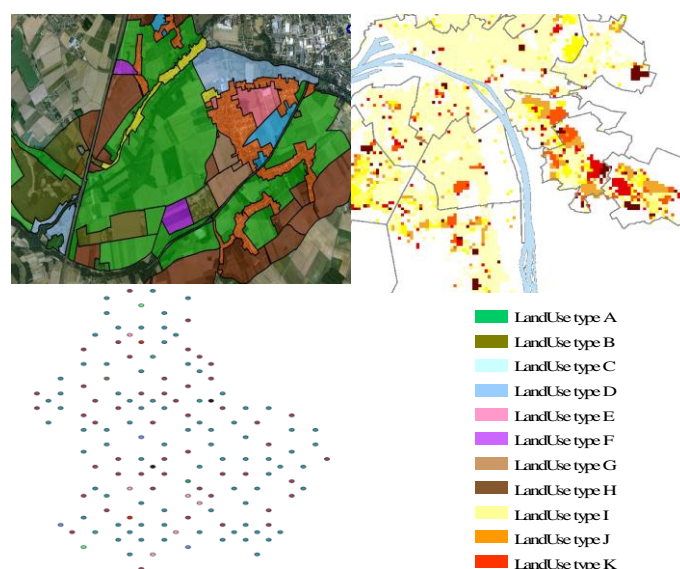


Figure 10 – showing three types of datasets containing Land use information:
Top left polygons overlaid on an orthophotography,
Top right pixels overlaid on administrative boundaries and water bodies,
Down left set of discrete location,
Down right classification system shown as a legend

The common aspects enable the assignment of a land use category to each polygon, pixel or location) from the hierarchical INSPIRE Land Use classification system (HILUCS) through HILUCS values and presences (see Figure 11).

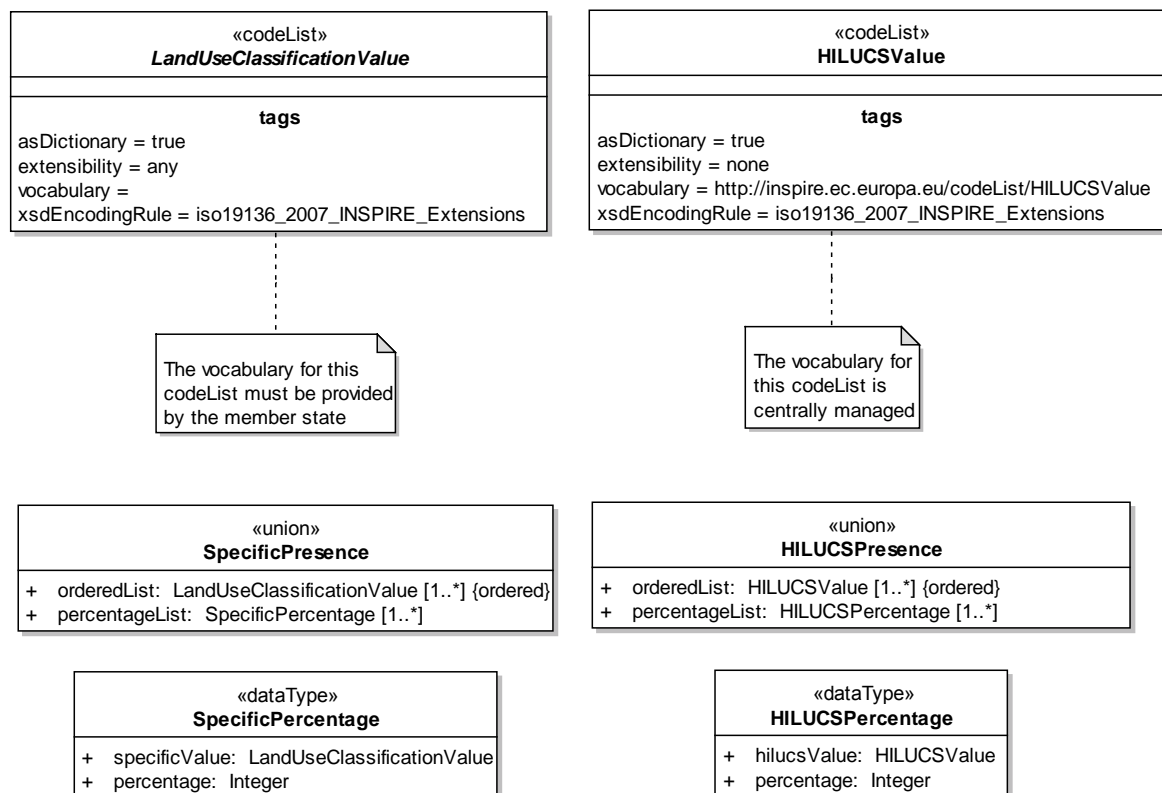


Figure 11 – UML Overview the common aspects and the Land Use classification systems

HILUCS will gradually evolve in a consistent way. The responsible body guiding this evolution is yet to be defined. The objective is to move towards a stable classification system at the European level. In order to ensure a minimum level of interoperability, it is mandatory to use the appropriate level of HILUCS that best fits the local nomenclatures.

IR Requirement 4 Any Land use Datasets shall assign to each polygon, pixel or location a land use type from the Hierarchical INSPIRE Land Use Classification System (HILUCS) at the most appropriate and detailed level of the hierarchy as described in 5.2.7.1.

The mandatory HILUCS code will allow to consistently visualise datasets from diverse sources with the same legend.

HILUCSValue has a «codeList» data type in order to connect to a register managed within INSPIRE.

The common aspects also enable the assignment of a land use category from at least one classification system that is stable and well-defined either at an international (such as SEEA from the UN, LUCAS from Eurostat), national or infra-national level, through specific values or presences. Mapping such a specific land use classification system with HILUCS will improve interoperability. Examples of such mapping is provided in annex C.

Any well-defined and stable classification system defined at a national or infra-national level shall be stored in a register managed by the member states. These code lists do not need to be translated in English but only the correspondence between the national codes and the HILUCS code shall be documented.

INSPIRE	Reference: D2.8.III.4_v2.9		
TWG-LU	Data Specification on <i>Land Use</i>	2012-02-23	Page 19

Recommendation 4

If specific land use is provided, the authority managing any well-defined and stable Classification system should document a mapping with the Hierarchical INSPIRE Land Use Classification System (HILUCS).

In order to allow progress in the area of semantic interoperability, i.e. the capacity to compare datasets connected to various (national) classification systems, the proposed hierarchical INSPIRE Land Use classification system (HILUCS) is general enough to allow any Land Use features to be linked to a Land Use type from the classification system. This applies to any land use data sets. HILUCS is hierarchical in order to allow semantic generalisation and flexibility.

For the definition of HILUCS the following principles have been applied:

- **Completeness:** the classification enables to cover the entire land area for all types of land use including land without specific use.
- **Absence of overlap:** the classification enables to assign for each piece of land a land use descriptor that describes the land use.
- **Dominance:** this is to account for multi-purpose nature of land-use. The use corresponds to the use of a piece of land as a whole. The use is not always easy to define and is most of the time based on pragmatic rules or on political will in the case of planned land use.
- **Independency of scale and data collection tools:** the classification, mainly due to its hierarchical nature, enables the accommodation of data obtained from different sources and at any scale.
- **Strict logic:** the classification has a sound foundation that is further explained in this section.
- **Time independency:** as the Land Use Theme addresses both the existing and the planned land use, the classification enables the definition of both the land use at the time of observation and the land use that is planned by spatial planning authorities.

The HILUCS has tried to be as pragmatic and easy to understand as possible in order to promote a consistent terminology. Rules for describing and naming headings for classes have reused widely recognized rationale and definitions such as NACE, LUCAS, SEEA. As this is a first attempt in the INSPIRE context, there should be a mechanism to manage the evolution of HILUCS. The next step of HILUCS will add characteristics representing the socio-economic aspects of the use of land necessary for environmental impact assessment.

The hierarchical nature of HILUCS has been devised based on two dimensions: the land and water perspective, and the economic perspective (see Figure 12). The objective is to provide a list of generic classes that every country could implement in their Land Use datasets at costs as marginal as possible enabling a basic level of semantic interoperability between datasets from all countries.

Planning of the use of sea and the use of seabed has been taken into consideration. HILUCS is applicable although some further work is needed to construct the correspondence between HILUCS and the terminology used in this area of spatial planning.

It must be noted that the models are not meant to provide information on the use of the underground of land.

From the land perspective (and how territories function) three aspects have been taken into consideration:

- **Nature:** it is the piece of land or water where most biodiversity (animal and vegetation) exists and develops. Obviously the agricultural land as well as forests and water bodies fall within nature as from a biodiversity point of view, animals use these areas for feeding or moving [Oxford dictionary says: Nature is the phenomena of the physical world collectively, including plants, animals, the landscape, and other features and products of the earth].

INSPIRE	Reference: D2.8.III.4_v2.9		
TWG-LU	Data Specification on <i>Land Use</i>	2012-02-23	Page 20

- Networking: it is the piece of land enabling people to get connected to each other. Thus it includes roads, railways, canals and by extension electricity, gas and telecommunication networks.
- Built up: these are the places where most of human activities take place when they are not in the natural environment or while travelling. Thus it includes residential areas as well as manufactures and mining & quarrying but also stadiums and sports area.

From an economical perspective, modern economy distinguishes at a basic level three activity categories:

- The primary sector of the economy involves the extraction and production of raw materials, such as corn, coal, wood and iron.
- The secondary sector of the economy involves the transformation of raw or intermediate materials into goods. This sector is often divided into light industry and heavy industry. Many of these industries consume large quantities of energy and require factories and machinery to convert the raw materials into goods and products. They also produce waste materials and waste heat that may pose environmental problems or cause pollution.
- The tertiary sector of the economy involves the provision of services to consumers and businesses, activities where people offer their knowledge, skills and time to improve productivity, performance, potential, and sustainability. The basic characteristic of this sector is the production of services instead of end products. Services (also known as "intangible goods") include attention, advice, experience, and discussion. It includes a way to describe a knowledge-based part of the economy which typically includes services such as information generation and sharing, information technology, consultation, education, research and development, financial planning, and other knowledge-based services as well as government.

From an INSPIRE point of view most of the 34 themes actually directly or indirectly refer to geographical objects of the real world. These objects may be connected to land use. The list below is an indication of the INSPIRE themes connected to Land Use. HILUCS is not meant to describe the uses in the same detail as the other themes do.

- annex I theme 7 and 8 is dealing with transport and hydrographical networks,
- annex II theme 4 geology may be dealing with surface bed rocks,
- annex III theme 2 building may enable to derive Land Use class from the information of activities occurring in buildings within a specific area
- annex III theme 5 may include hospitals and clinics,
- annex III theme 6 is dealing with Utility and government services,
- annex III themes 8 and 9 with production, industrial, agricultural and aquaculture facilities,
- annex III theme 18 with habitats and biotopes, and
- annex III theme 20 and 21 with energy resources and mineral resources.

Combining the 3 categories of the Land perspective and the 3 categories of the economic perspective one can relate the different characteristics of Land Use that are relevant to each combination.

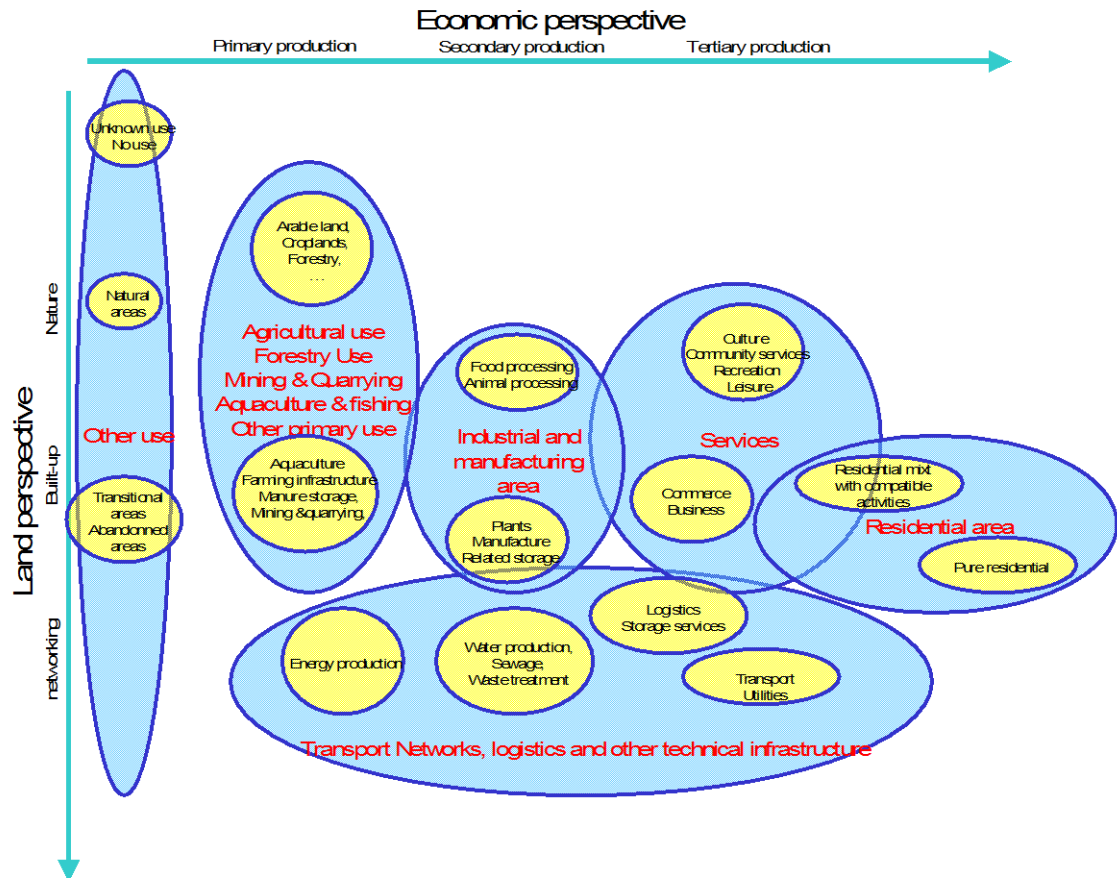


Figure 12 – Land perspective and economic perspective in HILUCS

The use of HILUCS (necessarily multi-language) is a first attempt. It will require revisiting within three years and it is recommended to place the maintenance under the hauspices of CEMAT with potentially EEA as the actual secretariat and EIONET as the technical body to involve member states. An alternative would be to use EUROSTAT or DG Regio and ESPON to instrument the maintenance of HILUCS.

Recommendation 5 It is recommended that a working party within INSPIRE shall be entrusted to propose an authority, a process and a mechanism for managing the evolution of HILUCS.

5.2.1.1.2. Existing land use

The Existing Land use application schema (see Figure 13) corresponds to a dataset that depicts the reality of the land use at a certain time.

Usage of dataset depicting existing land use may require providing information on the same piece of land at different time. The application schema does not implement this requirement. It means that the existing land use on the same area at two different times will be provided as two different datasets.

The «featureType» ExistingLandUseDataset contains the ExistingLandUseObject that correspond to an area having a unique defined land use.

An ExistingLandUseDataset may be created from several sources. Thus each ExistingLandUseObject may be associated with the time the documented land use corresponds to (attribute observationDate of «featureType» ExistingLandUseObject in Figure 13).

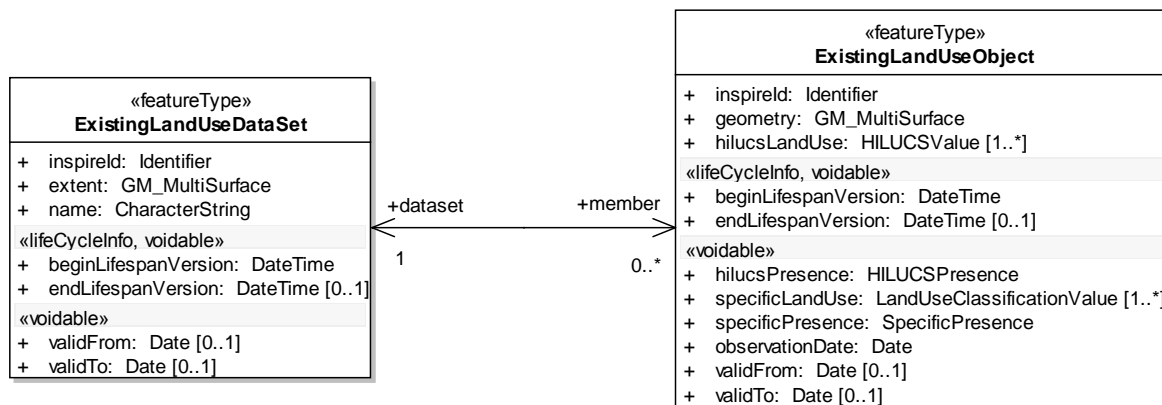


Figure 13 – UML Overview of the Existing Land Use application schema

The Existing Land Use application schema enables the provision of information on land uses inside one land use object. The ExistingLandUseObject may be associated with

- 1 to many HILUCSLandUse that represents the Land Use for the polygon from the economical point of view. It makes possible the assignment of more than one HILUCSLandUse existences when they cannot be managed by HILUCSPresences.
- 0 to many «dataType» HILUCSPresence and specificPresence to collect more than one HILUCSLandUse existence perfectly identifiable by importance order or percentages.
- 1 specificLandUse from other well-defined and stable classification system (national or local).
- 0 to many «dataType» specificPresence, to collect more than one specificLandUse existence perfectly identifiable by importance order or percentages.

According to these possibilities, four situations are identified (see Table 3):

- ❖ the land use object is associated with just one land use, its dominant land use: HILUCSLandUse will have only one value (cardinality of 1) (see Figure 14)



Figure 14 – Land use object with only one HILUCSLandUse value

❖ the land use object is associated with several land uses with no knowledge of relative importance: HILUCSLandUse will have a several values (cardinality greater than 1). This fact happens in different circumstances, when mapping between national classes and HILUCS is not complete for few detail in national classes (example A); or when information is supplied at different vertical levels (example B) or at different times (example C) (see Figure 15):





Figure 15 – Land use object with several HILUCSLandUse value with no knowledge of relative importance

❖ the land use object is associated with several land uses with the knowledge of relative importance but no knowledge of the proportion: HilucsLandUse will have one value (cardinality of 1) being the dominant land use and HILUCSPresence will provide the ordered list of land use but without informing on percentages (see Figure 16),



Figure 16 – Land use object with several HILUCSLandUse value with knowledge of relative importance

❖ the land use object is associated with several land uses with the knowledge of relative importance and proportion: HilucsLandUse will have one value (cardinality of 1) being the dominant land use, and HILUCSPresence will provide the ordered list of land use together with percentages (see Figure 17),

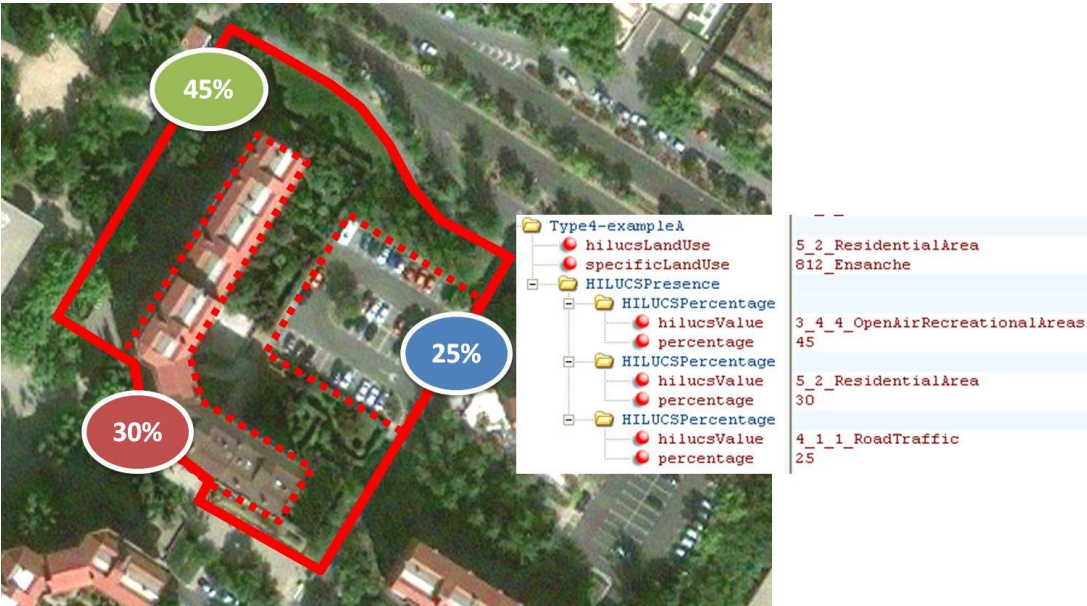


Figure 17 – Land use object with several HILUCSLandUse value with knowledge of relative importance and propotion

			Cardinality of HILUCSLandUse	Cardinality of HILUCSPresence	Provision of percentages
One land use			1	0	no
Several land uses	No knowledge of relative importance	No knowledge of percentages	≥ 2	0	
	Knowledge of relative importance	knowledge of percentages	1 (dominant)	≥ 2	yes

Table 3 – Options for representing land uses

The opportunity of providing several land uses will not indicate the location of each land uses but it will enable the provision of their relative importance, and the opportunity of providing their respective percentages gives the possibility to enable calculations of the surface of each land use inside one area. But only one type of presence (importance orders or percentages) can be supplied at same time.

SpecificLandUse always has a constant cardinality of 1, only one specific value can be supplied. However specificPresence works similarity than HILUCSPresence.

The two attributes 'percentage' are given for both the HILUCSPresence and the specificPresence as it is not expected that the Member States will redraw the ExistingLandUseObject limits. These are voidable as it may exist real situation where multiple uses exist in a given area without knowing their relative importance.

The extent of an ExistingLandUseDataset is defined as the boundary of the union of all the polygons (ExistingLandUseObject) that are a member of the ExistingLandUseDataset (see Figure 18)

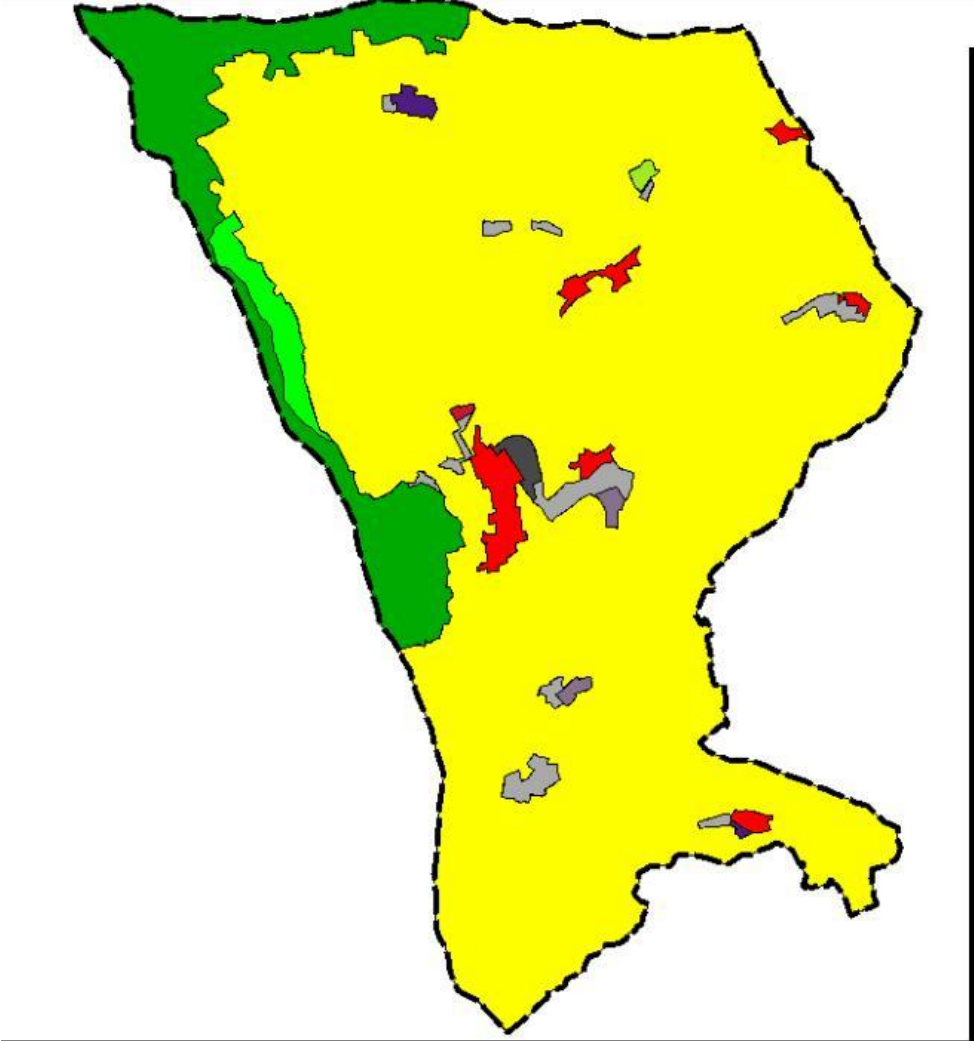


Figure 18 – the dotted line defines the Extent of an ExistingLandUseDataset

5.2.1.1.3. *Sampled Existing Land Use*

The Sampled Land use application schema (see Figure 19) corresponds to a dataset that depicts the reality of the land surface at discrete location on the earth. Often these datasets are collected for statistical purposes to provide estimates of land use over wider areas.

The «featureType» SampledLandUseDataset contains the LandUseSample that corresponds to a location which land use information is gathered at.

A SampledLandUseDataset may correspond to surveys done at different moment. Thus each LandUseSample may be associated with the time when the survey has been performed (attribute observationDate of «featureType» LandUseSample in Figure 19).

The Sampled Land Use application schema enables the provision of information on other land uses besides the dominant land use at the surveyed location. The LandUseSample may be associated with 1 to many HILUCSLandUse, 0 to many «dataType», HILUCSPresence, 1 specificLandUse and 0 to many specificPresence. That will enable to provide importances and percentages in similar way than for Existing Land Use. The same four situations are identified (see Table 3 in 5.2.1.1.2)

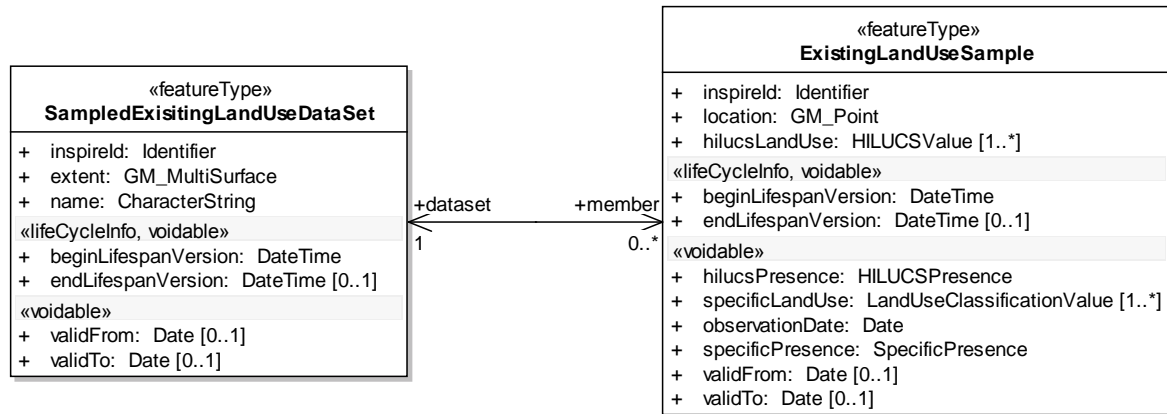


Figure 19 – UML Overview of the Sampled Land Use application schema

The extent of a SampledExistingLandUseDataset is defined as the smaller polygon that includes all the locations which land use information is gathered at (ExistingLandUseSample (see Figure 20)

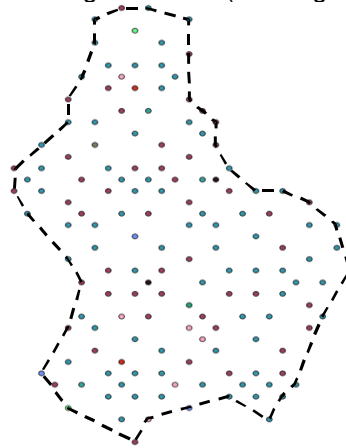


Figure 20 – the dotted line defines the Extent of an SampledExistingLandUseDataset

5.2.1.1.4. Gridded Land Use

The gridded land use application schema (see Figure 21) corresponds to a dataset that depicts land use with pixels, each pixel being associated with 1 HILUCSPresence or (exclusive) 1 specificPresence.

The pixels are grouped in a coverage («featureType» LandUseGridCoverage in the UML overview in Figure 21). Coverage («featureType» CoverageByDomainAndRange::RectifiedGridCoverage) inherits the properties from the coverage that is described in the INSPIRE document *Proposed Changes to the Generic Conceptual Model and Encoding Guidelines*. Only the GridCoverage subtypes of CoverageByDomainAndRange is permitted.

IR Requirement 5 The «featureType» CoverageByDomainAndRange must only be of subtypes GridCoverage

The definitions below are exported from the above mentioned document:

- CoverageByDomainAndRange: coverage which provides the domain and range as separate properties.
- MultiPointCoverage: coverage characterized by a finite domain consisting of points. Usually the
- GridCoverage : coverage whose domain consists of a collection of grid points

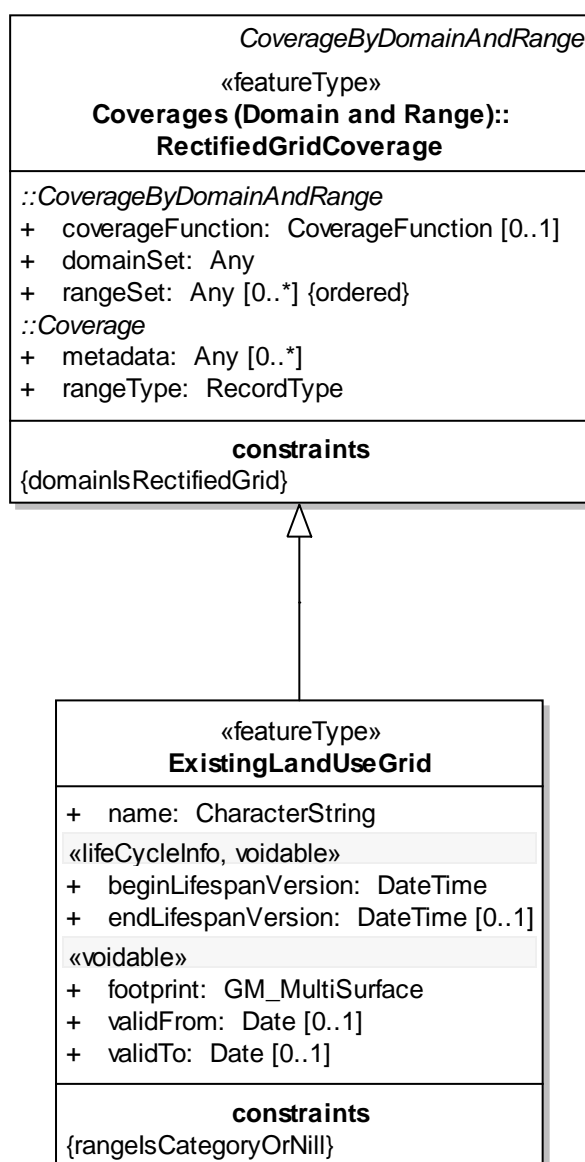


Figure 21 – UML Overview of the planned land use coverage

5.2.1.1.5. *Planned land use*

The planned land use conceptual schema (see Figure 22) corresponds to a dataset that corresponds to a spatial planning document. Geographical information as well as the informative or descriptive parts contained in a spatial planning documents are taken into consideration in the Land use data application schema. Only the spatial planning documents that are or have to be legally adopted by an authority and are opposable to third parties are considered within INSPIRE.

A spatial planning document corresponds to the **«featureType» SpatialPlan**. It has specific attributes such as its name (**planTypeName**) and the level of the administrative hierarchy it has been adopted in (**levelOfSpatialPlan**). It is possible to attach other information such as the legislation reference or the date and reference of the legal act that make it entering into force (see UML overview in Figure 22).

The concept of zoning is part of Planned Land Use in many countries. The zoning is composed of polygons that are mutually exclusive. Zoning provides regulation on how LandUse can evolve. The **«featureType» SpatialPlan** contains the **«featureType» ZoningElement** which allow expressing the land use that the administrative authority plans through its attribute **hilucsLandUse**. **ZoningElements**

INSPIRE	Reference: D2.8.III.4_v2.9		
TWG-LU	Data Specification on <i>Land Use</i>	2012-02-23	Page 29

have several specific attributes such as the nature of the regulation (regulationNature), indications on dimension rules that apply to the use of land and reference to the applicable regulation. The zoning elements are always viewed as polygons.

The nomenclature provides information on the type of land use that is permitted or forbidden inside each zoning element.

The attribute HILUCSLandUse has a multiplicity of 1 to many because planners on the one hand reserve areas for the future installation of economic activities not knowing a priori which activities will be installed and on the other hand they more and more create areas for “non-conflicting” activities or “mixed zones”. Thus providing several HILUCSLandUse values enables to provide the list of HILUCSValue that may apply to a ZoningElement.

Where in a SpatialPlan, areas are not subject to zoning, it is up to the data provider to decide on one of the following solutions:

- consider the area as a “hole”
- consider the area as a ZoninElement with the HILUCS code corresponding to “notKnownLandUse”

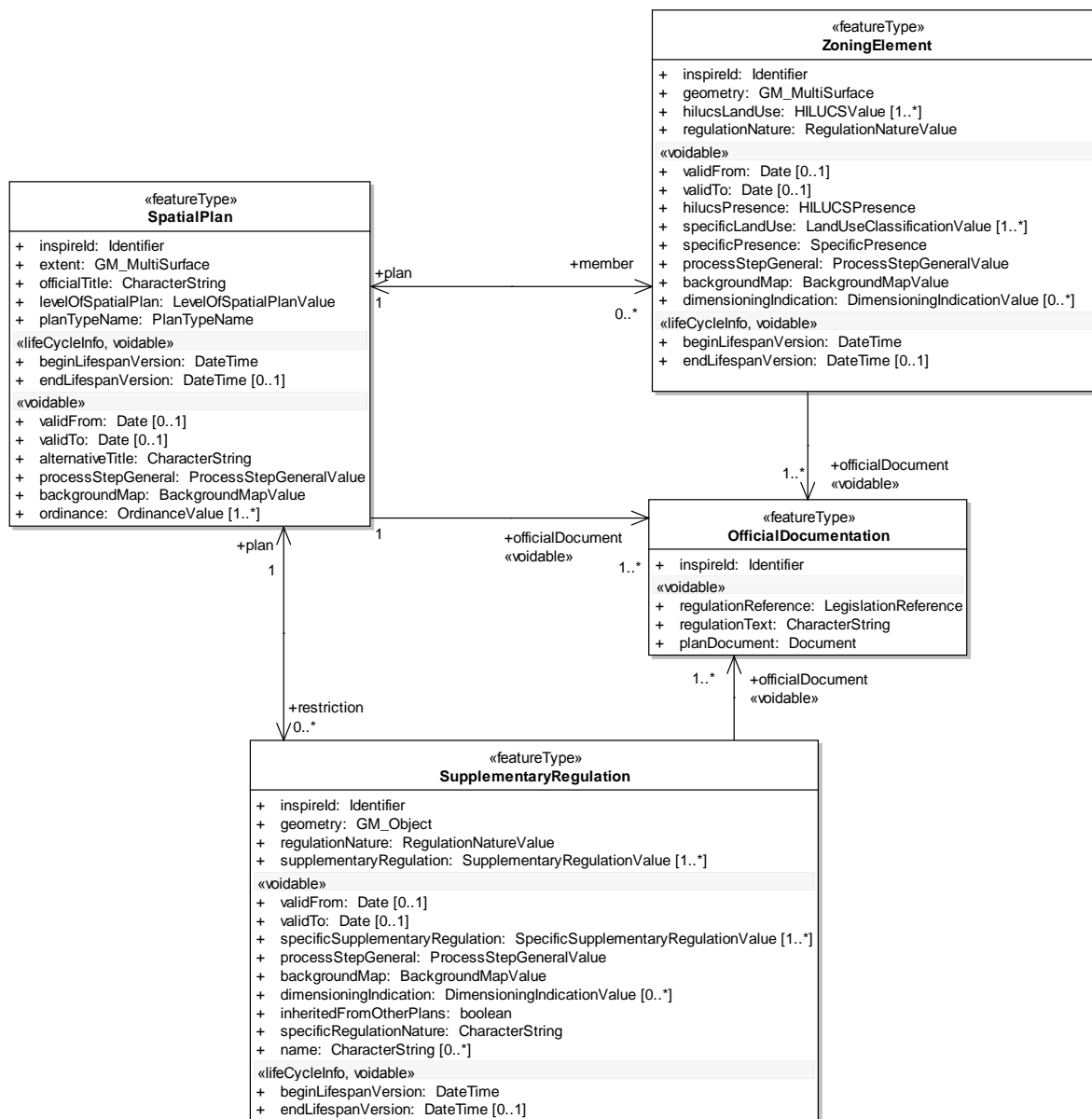


Figure 22 – UML Overview of the Planned Land Use application schema

Supplementary regulation

Supplementary information is often present in spatial planning document and delimits locations where a specific regulation applies and supplements the regulations of the zoning. These supplementary regulations may be seen as a buffer around an object of the real world. A point or a line can bear the regulation. This supplementary information is implemented in the «featureType» SupplementaryRegulation.

A specific nomenclature indicates the types of Supplementary Regulations that may exist in the spatial plan. It is country-dependant as it directly links to legal articles. The application schema enables the documentation of the fact that a Supplementary Regulation exists at a certain location and allows to connect to the description on how it affects the land use via country-dependant mechanism. These Supplementary Regulations vary in nature inside any spatial plan.

Figure 23 illustrates Supplementary Regulations that may exist over a given area. The type of supplementary regulations is given by the attributes supplementaryRegulation (with values from a hierarchical supplementary regulation code list managed within INSPIRE) and localSupplementaryRegulation of the «featureType» SupplementaryRegulation (with values from a local code list). Mapping the equivalence between these values should be provided by data producers. Further work is though needed for achieving a European harmonisation on that matter 5.2.7.2 provide the proposed hierarchical INSPIRE supplementary regulation code list (HSRCL).

NOTE1: by extension, any point or line that in a spatial plan provides information related to HILUCS should be modelled as a SupplementaryRegulation with the code corresponding to "other supplementary regulation" in the HSRCL.

NOTE2: Any information related to the use of the underground should be modelled as a SupplementaryRegulation.

NOTE3: Planned land use incorporate elements that in the real world can be related to other INSPIRE spatial data themes such as Area management/restriction/regulation zones and reporting units (AM, Annex III theme 11) or Natural Risk Zones (NZ, annex III theme 12). These will be seen as supplementary regulation in the Land Use data model (planned land Use) as soon as this information is incorporated in the legal spatial plan, i.e. only information that is geographical and legally binding in the spatial plan will be considered as a supplementary regulation although it may belong to another theme. For example, any Restriction/Regulation Zone that is not explicitly incorporated in a spatial plan belongs to the AM theme, and any Restriction/Regulation Zone that is incorporated in a spatial plan (i.e. whose geometry and attributes are included in the "paper form" spatial plan) will be modelled as supplementary regulation.

IR Requirement 6	When a zone has been established to regulate planned land use and defined within a legally binding spatial plan it falls within scope of the Land Use theme and such be encoded as a SupplementaryRegulation. But if the zone has been established by legislative requirement but not defined within a legally binding spatial plan it should be encoded as a ManagementRestrictionOrRegulationZone
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Recommendation 6	The codelist given in the code list section for SupplementaryRegulation (5.2.7.2) is a first draft. It is recommended that Member states start the process of mapping their national code list with the proposed one and that a working party be established at the European level to make progress towards a European code list for supplementary regulations.
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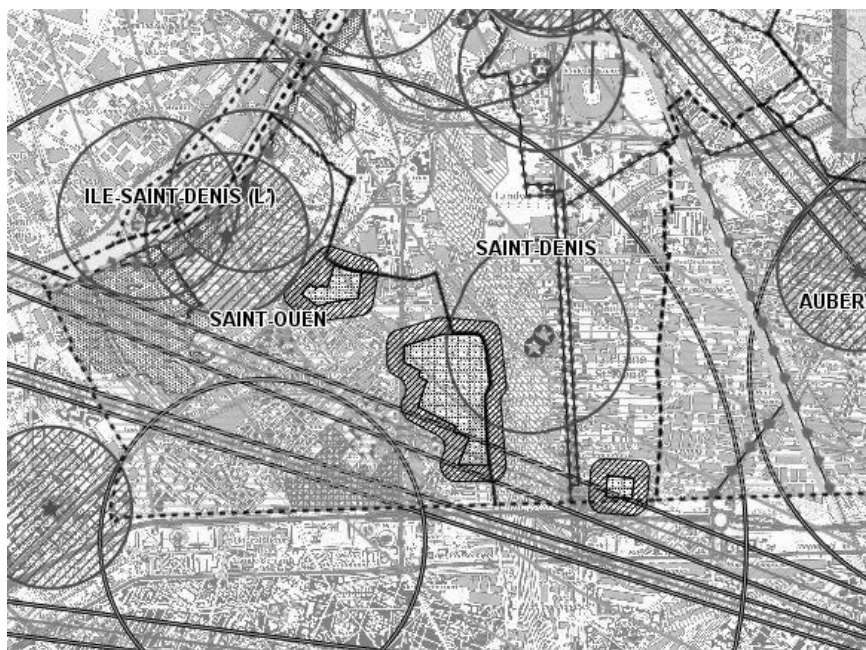


Figure 23 – graphical representation of Supplementary Regulations overlaid on a topographic map

Other aspects

Planned land use datasets are specific as they correspond to legal documents containing the regulations. The application schema implements the requirement to include inside the dataset the digital facsimile of the regulation («dataType» Document). But the regulation itself may be attached to the spatial plan as well as to any Zoning Element or to any Supplementary Regulations. The «featureType» OfficialDocumentation implements that requirement. OfficialDocumentation can either be the text itself, the reference to the official journal that contains it or the URL of the document that contains it.

The scanned version of any maps included in spatial planning documents may also be associated to the spatial plan («dataType» Document). The objective for the provision of scanned map is two fold:

- allow the provision of the scanned version of the official spatial plan together with the vector SpatialPlan because only the paper based version is the official one in many member states,
- allow the provision of spatial plans in digital form where no vector data exists.

The attribute planDocument of the feature type OfficialDocumentation must be used to provide scanned version of a spatial plan either as text, image or georeferenced image. The MIME extension should be used to inform on its format.

The PLU application schema also accommodates the situation where several spatial plans have already been aggregated into a single dataset as well as situation where several spatial plan has been aggregated into a single spatial plan itself being a single dataset.

The extent of a SpatialPlan is defined as the limit of the union of all the ZoningElements and the SupplementaryRegulation that are a member of the SpatialPlan (see Figure 24).

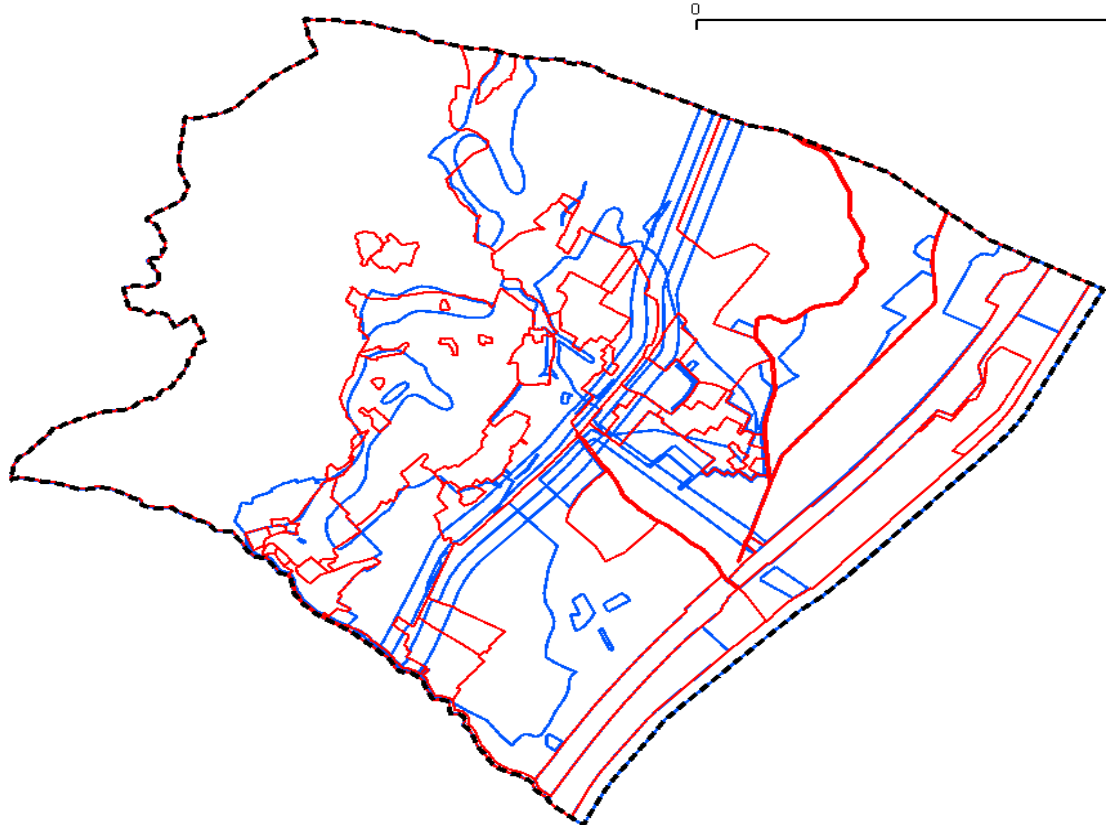


Figure 24 – the dotted line defines the Extent of a SpatialPlan where in blue are the SupplementaryRegulation and in red the ZoningElement

Where a SpatialPlan only contains the scanned version of a paper map, the extent should be defined as the outer limit of the cartographic image of the spatial plan (see Figure 25)

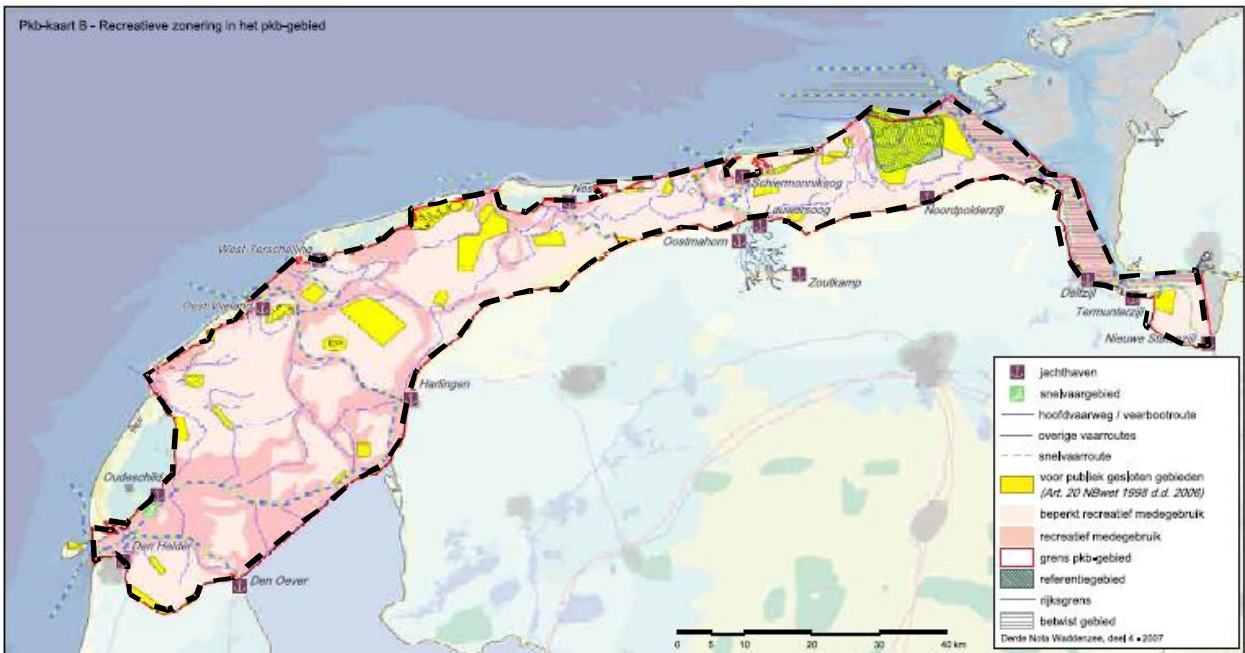


Figure 25 – the dotted line defines the Extent of a SpatialPlan that only contains a scanned version of the spatial plan

Figure 26 provides a UML overview of the code lists and enumeration used in the Planned Land Use application schema

Figure 27 provides a UML overview of the data types used in the Planned Land Use application schema

Figure 28 provides a UML overview of the data type LegislationReference from the generic conceptual model used in the Planned Land Use application schema.

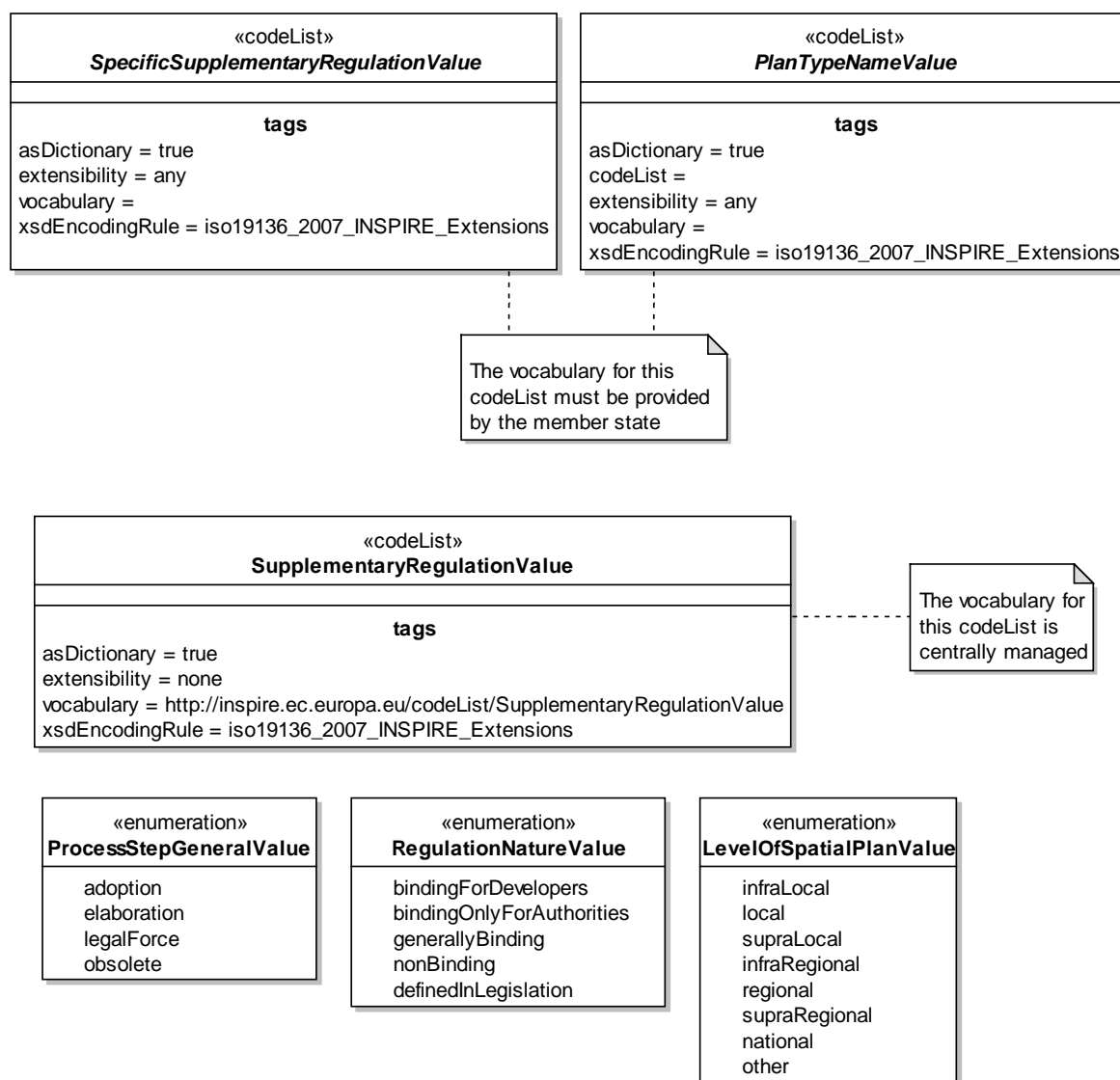


Figure 26 – UML Overview of the Planned Land Use code lists and external types

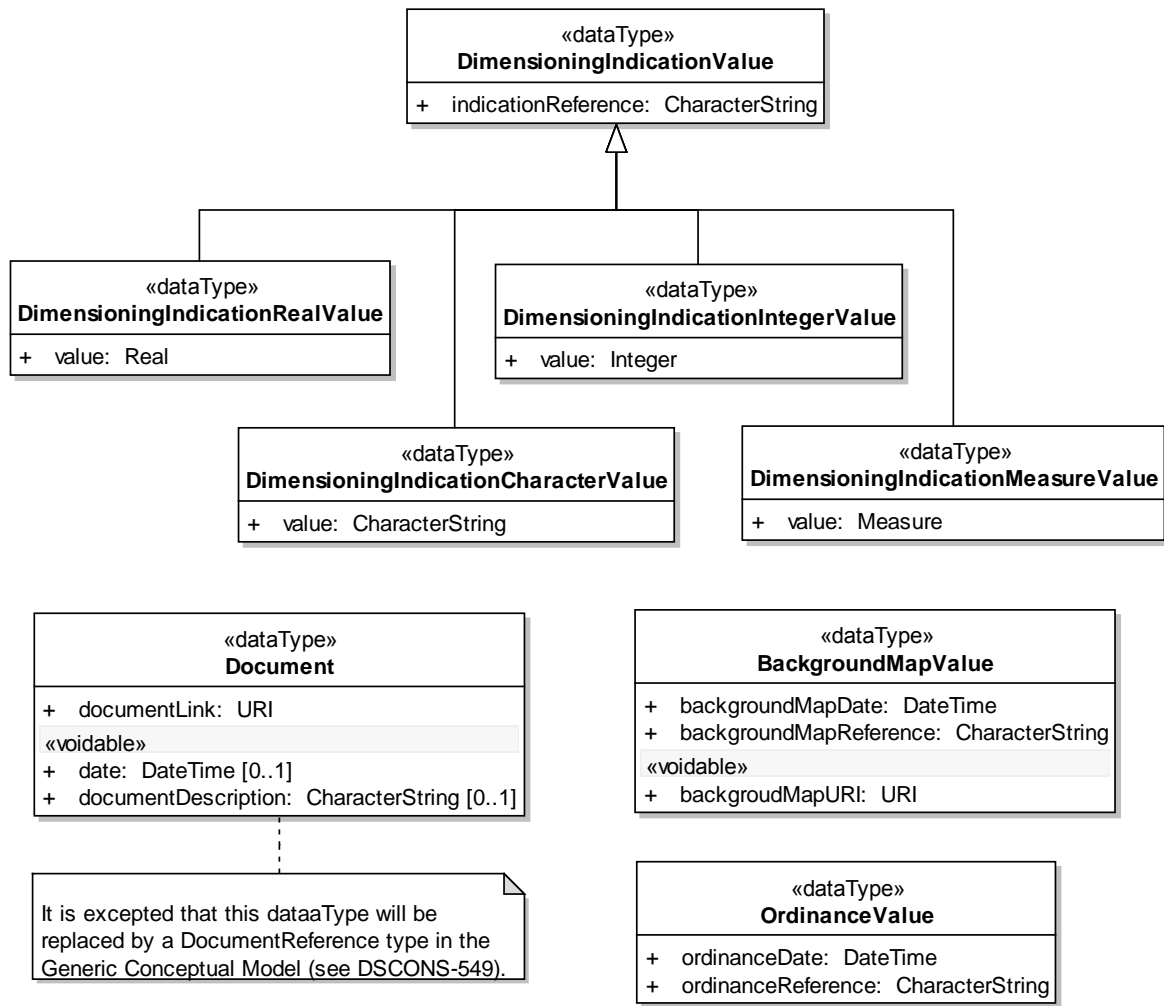


Figure 27 – UML Overview of the Planned Land Use data types

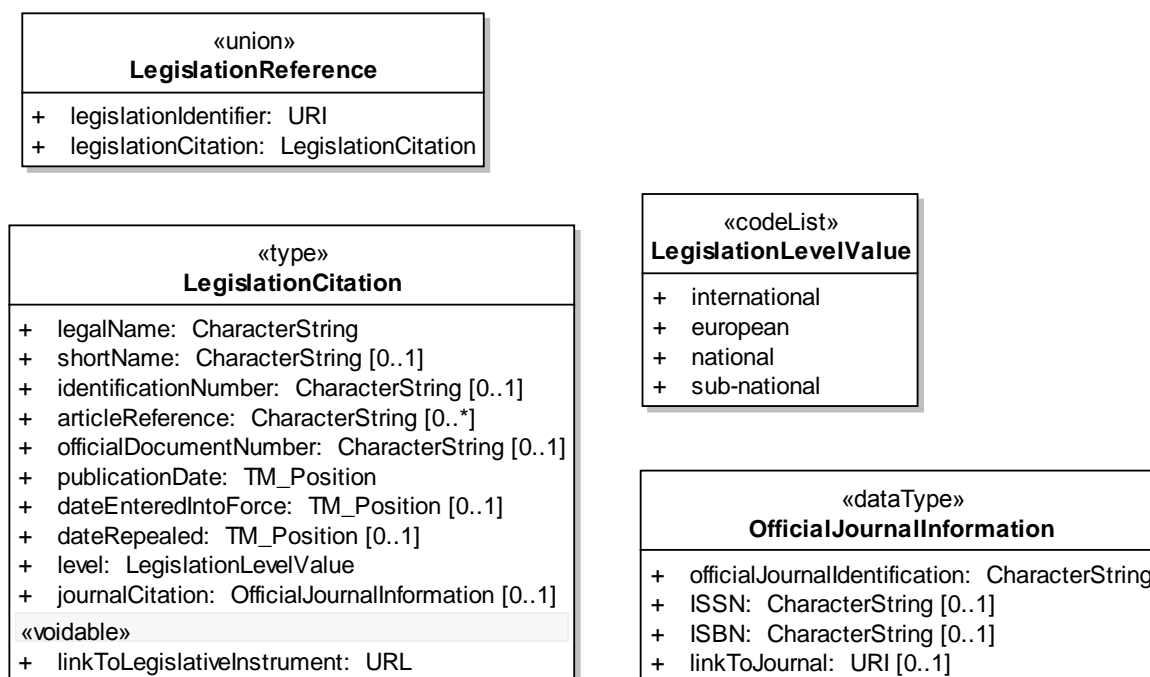


Figure 28 – UML diagram of LegislationRefence from Generic Conceptual Model
(TODO: wait for outcome of DSCONS-549)

5.2.1.2. Consistency between spatial data sets

Spatial plans are often drawn on the backdrop of another map (e.g. cadastral parcels or topographic data or orthoimagery). However, the INSPIRE *Planned Land Use* data specification represents spatial plans as absolute, not relative geometries. That is, they have their own, absolute geometries and their geographical location is not dependent on other features (other than during their original delineation). This is because many Member States do not update their spatial plans if there are changes to the backdrop data, and in any case, the legal definition of a spatial plan remains fixed even if there are underlying changes to the backdrop data. Metadata may provide information on the backdrop that has been used at the time the spatial plan enters into force.

Existing Land Use data is often collected in combination with Land Cover data and in that case geometries in the two datasets will often be equivalent. Because there is no relationship in INSPIRE between Land Use and Land Cover this consistency will not be enforced.

It can be possible that different spatial plans (different datasets), for example of different levels (municipal and regional) or of different times (one from 1970 and one from 2010), are overlapping.

Data providers may solve the slivers between adjacent spatial plans if they provide such a combined data set. If slivers cannot be resolved, it is recommended to provide different datasets. INSPIRE will not thus solve the slivers issues.

At a regional level it is not necessary to take care of municipality borders, in contrast at the municipality level (e.g. preparatory land-use plans for the entire area) zoning elements should not overlay with zoning elements of a neighbouring municipality. It is up to data providers to possibly resolve such slivers. INSPIRE will not provide mechanisms for that level of harmonisation.

Annex H provides example of spatial plans at state level modelled according to the planned land use data application schema.

5.2.1.3. Identifier management

The reason for having INSPIRE identifiers are twofold:

- provide a stable identifier for users to liaise with their own information,
- provide a stable identifier internal to the dataset in order to implement the relationships identified in the application schema.

Regarding ExistingLandUseDataSet and SampledLandUseDataSet, stable identifiers are required when several datasets provide information over the same area but at different date. They ease the construction of how land use evolved through time.

At national level, Spatial plans usually have a unique identifier but sub-elements (e.g. ZoningElement and SupplementaryRegulation) may have identifiers that are only unique within the context of a given dataset. An inspireId can be constructed by combining the identifiers of the plan with the local identifier.

5.2.1.4. Modelling of object references

Spatial plans are legal documents that regulate what developments are allowed, allowed under certain circumstances and not allowed in an area. The various parts of the plan use the TextualRegulation object to make a reference to the legal text or a specific location in a legal document.

Furthermore, Spatial Plans can be provided as scanned documents or structural drawing that are not always geo-referencable maps (See Figure 29 as an example).

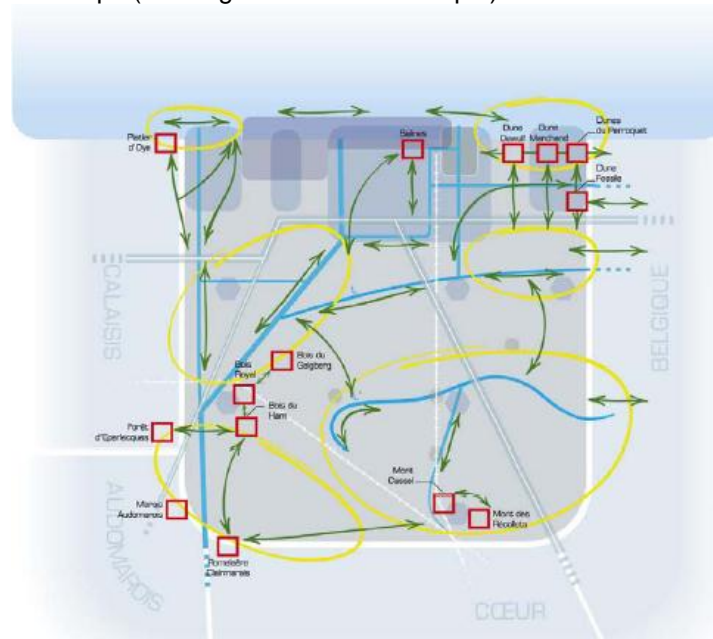


Figure 29 – example of a non-geo-referencable map in a spatial plan (Scot Flandre-Dunkerque)

A link to these documents can be provided via the officialDocumentation association (see Figure 22).

5.2.1.5. Geometry representation

IR Requirement 7 The value domain of spatial properties used in this specification shall be restricted to the Simple Feature spatial schema as defined by EN ISO 19125-1.

NOTE The specification restricts the spatial schema to 0-, 1-, 2-, and 2.5-dimensional geometries where all curve interpolations are linear.

INSPIRE	Reference: D2.8.III.4_v2.9		
TWG-LU	Data Specification on <i>Land Use</i>	2012-02-23	Page 37

NOTE The topological relations of two spatial objects based on their specific geometry and topology properties can in principle be investigated by invoking the operations of the types defined in ISO 19107 (or the methods specified in EN ISO 19125-1).

5.2.1.6. Temporality representation

The application schema(s) use(s) the derived attributes "beginLifespanObject" and "endLifespanObject" to record the lifespan of a spatial object.

The attributes "beginLifespanVersion" specifies the date and time at which this version of the spatial object was inserted or changed in the spatial data set. The attribute "endLifespanVersion" specifies the date and time at which this version of the spatial object was superseded or retired in the spatial data set.

NOTE 1 The attributes specify the beginning of the lifespan of the version in the spatial data set itself, which is different from the temporal characteristics of the real-world phenomenon described by the spatial object. This lifespan information, if available, supports mainly two requirements: First, knowledge about the spatial data set content at a specific time; second, knowledge about changes to a data set in a specific time frame. The lifespan information should be as detailed as in the data set (i.e., if the lifespan information in the data set includes seconds, the seconds should be represented in data published in INSPIRE) and include time zone information.

NOTE 2 Changes to the attribute "endLifespanVersion" does not trigger a change in the attribute "beginLifespanVersion".

Recommendation 7 If life-cycle information is not maintained as part of the spatial data set, all spatial objects belonging to this data set should provide a void value with a reason of "unpopulated".

In Existing Land Use the temporal attributes validFrom and validTo are used to indicate when the given object is valid in reality (as opposed to the beginLifespanVersion and endLifespanVersion that gives information on the validity of the object in the system). In many cases this information will not be known: It may be observed that an area has changed from one land use type to another, but not when the change happened. In this case the observationDate can be used to specify when the new type was observed.

In Planned Land Use a SpatialPlan describes the future and it has the attributes validFrom and validTo to define the validity of the SpatialPlan in reality, i.e. the time period during which the rules of the plan are legally valid. For spatial plans the end date of the legal validity may not be known, e.g. when a spatial plan is valid till it is superseded by a more recent plan. In that case the validTo date will have the void value. It is also possible that (part of) a spatial plan is annulled by a legal body. In that case the valid to date will be filled.

The application schemas also are usable for archived datasets although data providers may decide not to provide the corresponding data through INSPIRE.

5.2.2 Feature catalogue Land Use Nomenclature

Table 3 - Feature catalogue metadata

Feature catalogue name	INSPIRE feature catalogue Land Use Nomenclature
Scope	Land Use Nomenclature
Version number	2.9

Version date	2012-02-23
Definition source	INSPIRE data specification Land Use Nomenclature

Table 4 - Types defined in the feature catalogue

Type	Package	Stereotypes	Section
HILUCSPercentage	Land Use Nomenclature	«dataType»	5.2.2.1.1
HILUCSPresence	Land Use Nomenclature	«union»	5.2.2.1.2
HILUCSValue	Land Use Nomenclature	«codeList»	5.2.2.2.1
LandUseClassificationValue	Land Use Nomenclature	«codeList»	5.2.2.2.2
SpecificPercentage	Land Use Nomenclature	«dataType»	5.2.2.1.3
SpecificPresence	Land Use Nomenclature	«union»	5.2.2.1.4

5.2.2.1. Data types

5.2.2.1.1. HILUCSPercentage

HILUCSPercentage	
Name:	HILUCS percentage
Definition:	Percentage of land use object that is covered by this HILUCS presence.
Description:	NOTE1:The percentage is according to the socio-economic or functional importance of the use. NOTE2:examples are provided in the narrative description part of the data specification.
Status:	Proposed
Stereotypes:	«dataType»
Identifier:	null
Attribute: percentage	
Value type:	Integer
Definition:	Percentage of land use object that is covered by this HILUCS presence.
Description:	NOTE The percentage is according to the socio-economic importance of the use. In section 5.2.1.1.2. examples of the use of percentages are given.
Multiplicity:	1
Attribute: hilucsValue	
Value type:	HILUCSValue
Definition:	HILUCS category for this HILUCS percentage.
Multiplicity:	1
Obligation:	Technical Guidance (recommendation)

5.2.2.1.2. HILUCSPresence

HILUCSPresence	
Name:	HILUCS precense
Definition:	presence of a HILUCS value in an area where there are several values together with a percentage. A void value for percentage means that it is unknown.
Description:	The HILUCS presence data type enables the provision of information on land uses inside one land use object in order to collect more than one land use existence perfectly identifiable by importance order or percentages. NOTE 1: The order of land use value presence without percentages enable providing an order of dominance/importance of each land use present in the land use object NOTE 2:The sum of the percentages can be below 100%, or above. The order is provided according to the respective importance when the percentages are not known.
Status:	Proposed

INSPIRE	Reference: D2.8.III.4_v2.9		
TWG-LU	Data Specification on <i>Land Use</i>	2012-02-23	Page 39

HILUCSPresence

Stereotypes: «union»
Identifier: null

Attribute: orderedList

Value type: HILUCSValue
Multiplicity: 1..*
Obligation: Technical Guidance (recommendation)
Collection: ordered
Constraints:

Attribute: percentageList

Value type: HILUCSPercentage
Multiplicity: 1..*

5.2.2.1.3. SpecificPercentage

SpecificPercentage

Name: Specific Percentage
Status: Proposed
Stereotypes: «dataType»
Identifier: null

Attribute: specificValue

Value type: LandUseClassificationValue
Definition: specific value category for this specific percentage.
Multiplicity: 1
Obligation: Technical Guidance (recommendation)

Attribute: percentage

Value type: Integer
Definition: Percentage of land use object that is covered by this HILUCS presence.
Description: NOTE The percentage is according to the socio-economic importance of the use. In section 5.2.1.1.2. examples of the use of percentages are given.
Multiplicity: 1

5.2.2.1.4. SpecificPresence

SpecificPresence

Name: specific presence
Definition: Indication of the presence of a land use classification value according to the code list provided by the data provider. If a percentage is provided it indicates the percentage of this specific use in this object. The specific presence data type enables the provision of information on land uses inside one land use object in order to collect more than one land use existence perfectly identifiable by importance order or percentages.
Description: NOTE 1: The order of land use value presence without percentages enable providing an order of dominance/importance of each land use present in the land use object
NOTE 2: The sum of the percentages can be below 100%, or above. The order is provided according to the respective importance when the percentages are not known.
Status: Proposed
Stereotypes: «union»
Identifier: null

Attribute: orderedList

INSPIRE	Reference: D2.8.III.4_v2.9		
TWG-LU	Data Specification on <i>Land Use</i>	2012-02-23	Page 40

SpecificPresence

Value type: LandUseClassificationValue
 Multiplicity: 1..*
 Obligation: Technical Guidance (recommendation)
 Collection: ordered
 Constraints:

Attribute: percentageList

Value type: SpecificPercentage
 Multiplicity: 1..*

5.2.2.2. Code lists

5.2.2.2.1. HILUCSValue

HILUCSValue

Name: HILUCS value
 Definition: List of land use categories to be used in INSPIRE Land Use and agreed at the European level.
 Description: This list is populated with the land use categories of the Hierarchical INSPIRE Land Use Classification System.
 The elements of the list should be both applicable to existing land use and planned land use.
 Status: Proposed
 Stereotypes: «codeList»
 Extensibility: none
 Identifier: <http://inspire.ec.europa.eu/codeList/HILUCSValue>

5.2.2.2.2. LandUseClassificationValue

LandUseClassificationValue (abstract)

Name: land use classification value
 Definition: List of land use categories to be used in INSPIRE Land Use and agreed at a national or local level.
 Description: This CodeList is empty in the INSPIRE context and must be extended by each data provider in their nationalcodeList register.
 Status: Proposed
 Stereotypes: «codeList»
 Extensibility: any
 Identifier:

5.2.2.3. Imported types (informative)

This section lists definitions for feature types, data types and enumerations and code lists that are defined in other application schemas. The section is purely informative and should help the reader understand the feature catalogue presented in the previous sections. For the normative documentation of these types, see the given references.

5.2.2.3.1. Integer

Integer

Package: INSPIRE Consolidated UML Model::Foundation Schemas::ISO TC211::ISO 19103:2005 Schema Language::Basic Types::Primitive::Numerics [Include reference to the document that includes the package, e.g. INSPIRE data specification, ISO standard or the GCM]

5.2.3 Feature catalogue Existing Land Use

Table 3 - Feature catalogue metadata

Feature catalogue name	INSPIRE feature catalogue Existing Land Use
Scope	Existing Land Use
Version number	2.9
Version date	2012-02-23
Definition source	INSPIRE data specification Existing Land Use

Table 4 - Types defined in the feature catalogue

Type	Package	Stereotypes	Section
ExistingLandUseDataSet	Existing Land Use	«featureType»	5.2.3.1.1
ExistingLandUseObject	Existing Land Use	«featureType»	5.2.3.1.2

5.2.3.1. Spatial object types

5.2.3.1.1. ExistingLandUseDataSet

ExistingLandUseDataSet	
Name:	existing land use data set
Definition:	An existing land use data set is a collection of areas for which information on existing (present or past) land uses is provided.
Status:	Proposed
Stereotypes:	«featureType»
Identifier:	null
Attribute: beginLifespanVersion	
Value type:	DateTime
Definition:	Date and time at which this version of the existing land use data set was inserted or changed in the provided set of data.
Multiplicity:	1
Stereotypes:	«lifeCycleInfo,voidable»
Attribute: endLifespanVersion	
Value type:	DateTime
Definition:	Date and time at which this version of the existing land use data set was superseded or retired in the provided set of data.
Multiplicity:	0..1
Stereotypes:	«lifeCycleInfo,voidable»
Attribute: extent	
Name	existing land use data set
Value type:	GM_MultiSurface
Definition:	Boundary of the geometrical union of all the instances of the featureType ExistingLandUseObject.
Multiplicity:	1
Attribute: name	
Value type:	CharacterString
Definition:	Human readable name of the dataset.
Multiplicity:	1
Attribute: validFrom	
Value type:	Date
Definition:	First date at which this existing land use data set is valid in reality.
Multiplicity:	0..1

INSPIRE	Reference: D2.8.III.4_v2.9		
TWG-LU	Data Specification on <i>Land Use</i>	2012-02-23	Page 42

ExistingLandUseDataSet

Stereotypes: «voidable»

Attribute: validTo

Value type: Date
Definition: The date from which this existing land use data set no longer exists in the real world.
Multiplicity: 0..1
Stereotypes: «voidable»

Attribute: inspireId

Value type: Identifier
Definition: External object identifier of the existing land use dataset.
Description: NOTE An external object identifier is a unique object identifier published by the responsible body, which may be used by external applications to reference the spatial object. The identifier is an identifier of the spatial object, not an identifier of the real-world phenomenon.
Multiplicity: 1

Association role: member

Value type: ExistingLandUseObject
Multiplicity: 0..*

5.2.3.1.2. ExistingLandUseObject

ExistingLandUseObject

Name: existing land use object
Definition: An existing land use object describes the land use of an area having an homogeneous combination of land use types.
Status: Proposed
Stereotypes: «featureType»
Identifier: null

Attribute: beginLifespanVersion

Value type: DateTime
Definition: Date and time at which this version of the spatial object was inserted or changed in the spatial data set.
Multiplicity: 1
Stereotypes: «lifeCycleInfo,voidable»

Attribute: hilucsPresence

Name: land use presence
Value type: HILUCSPresence
Definition: Actual presence of a land use category according to HILUCS within the object.
Multiplicity: 1
Stereotypes: «voidable»

Attribute: hilucsLandUse

Value type: HILUCSValue
Definition: Land use HILUCS classes that are present in this existing land use object.
Description: NOTE The Existing Land Use model enables the provision of information on land uses inside one land use object. The ExistingLandUseObject may be associated with 1 to many HILUCSLandUse that represents the Land Uses for the polygon from the economical point of view. It makes possible the assignment of more than one HILUCSLandUse existences when they cannot be managed by HILUCSPresences.

INSPIRE	Reference: D2.8.III.4_v2.9		
TWG-LU	Data Specification on <i>Land Use</i>	2012-02-23	Page 43

ExistingLandUseObject

Multiplicity: 1..*
Obligation: Technical Guidance (recommendation)

Attribute: observationDate

Name: Observation Date.
Value type: Date
Definition: The observation date associated to a description.
Description: Defines the observation date of the description. It could be the date of an aerial/satellite acquisition or a field survey. The observation date allows the user to have accurate date of when the description was made in the real word. In a database, not all objects are necessarily captured at the same time.
Multiplicity: 1
Stereotypes: «voidable»

Attribute: endLifespanVersion

Value type: DateTime
Definition: Date and time at which this version of the spatial object was superseded or retired in the spatial data set.
Multiplicity: 0..1
Stereotypes: «lifeCycleInfo,voidable»

Attribute: inspireId

Value type: Identifier
Definition: External object identifier of the existing land use object.
Description: An external object identifier is a unique object identifier published by the responsible body, which may be used by external applications to reference the spatial object. The identifier is an identifier of the spatial object, not an identifier of the real-world phenomenon.
Multiplicity: 1

Attribute: specificLandUse

Value type: LandUseClassificationValue
Definition: Land Use Category according to the nomenclature specific to this dataset.
Description: Reference to an entry in the classification that is part of the SpecificLandUseClassification.
Multiplicity: 1..*
Stereotypes: «voidable»
Obligation: Technical Guidance (recommendation)

Attribute: validFrom

Value type: Date
Definition: The time when the phenomenon started to exist in the real world.
Multiplicity: 0..1
Stereotypes: «voidable»

Attribute: validTo

Value type: Date
Definition: First date at which this version of this LandUseObject is valid in reality.
Multiplicity: 0..1
Stereotypes: «voidable»

Attribute: specificPresence

Name: land use presence
Value type: SpecificPresence

INSPIRE	Reference: D2.8.III.4_v2.9		
TWG-LU	Data Specification on <i>Land Use</i>	2012-02-23	Page 44

ExistingLandUseObject

Definition: Actual presence of a land use category within the object.
 Multiplicity: 1
 Stereotypes: «voidable»

Attribute: geometry

Value type: GM_MultiSurface
 Multiplicity: 1

Association role: dataset

Value type: ExistingLandUseDataSet
 Definition: existing land use dataset to which this land use object belongs.
 Multiplicity: 1

5.2.3.2. Imported types (informative)

This section lists definitions for feature types, data types and enumerations and code lists that are defined in other application schemas. The section is purely informative and should help the reader understand the feature catalogue presented in the previous sections. For the normative documentation of these types, see the given references.

5.2.3.2.1. *CharacterString*

CharacterString

Package: INSPIRE Consolidated UML Model::Foundation Schemas::ISO TC211::ISO 19103:2005 Schema Language::Basic Types::Primitive::Text [Include reference to the document that includes the package, e.g. INSPIRE data specification, ISO standard or the GCM]

5.2.3.2.2. *Date*

Date

Package: INSPIRE Consolidated UML Model::Foundation Schemas::ISO TC211::ISO 19103:2005 Schema Language::Basic Types::Primitive::Date and Time [Include reference to the document that includes the package, e.g. INSPIRE data specification, ISO standard or the GCM]

5.2.3.2.3. *DateTime*

DateTime

Package: INSPIRE Consolidated UML Model::Foundation Schemas::ISO TC211::ISO 19103:2005 Schema Language::Basic Types::Primitive::Date and Time [Include reference to the document that includes the package, e.g. INSPIRE data specification, ISO standard or the GCM]

5.2.3.2.4. *GM_MultiSurface*

GM_MultiSurface

Package: INSPIRE Consolidated UML Model::Foundation Schemas::ISO TC211::ISO 19107:2003 Spatial Schema::Geometry::Geometric aggregates [Include reference to the document that includes the package, e.g. INSPIRE data specification, ISO standard or the GCM]

5.2.3.2.5. *HILUCSPresence*

HILUCSPresence

Package: INSPIRE Consolidated UML Model::Themes::Annex III::Land Use::Land Use Nomenclature [Include reference to the document that includes the package, e.g. INSPIRE data specification, ISO standard or the GCM]
 Definition: presence of a HILUCS value in an area where there are several values together with a percentage. A void value for percentage means that it is unknown.

INSPIRE	Reference: D2.8.III.4_v2.9		
TWG-LU	Data Specification on <i>Land Use</i>	2012-02-23	Page 45

HILUCSPresence

Description: The HILUCS presence data type enables the provision of information on land uses inside one land use object in order to collect more than one land use existence perfectly identifiable by importance order or percentages.
NOTE 1: The order of land use value presence without percentages enable providing an order of dominance/importance of each land use present in the land use object
NOTE 2: The sum of the percentages can be below 100%, or above. The order is provided according to the respective importance when the percentages are not known.

5.2.3.2.6. HILUCSValue

HILUCSValue

Package: INSPIRE Consolidated UML Model::Themes::Annex III::Land Use::Land Use Nomenclature [Include reference to the document that includes the package, e.g. INSPIRE data specification, ISO standard or the GCM]
Definition: List of land use categories to be used in INSPIRE Land Use and agreed at the European level.
Description: This list is populated with the land use categories of the Hierarchical INSPIRE Land Use Classification System.

The elements of the list should be both applicable to existing land use and planned land use.

5.2.3.2.7. Identifier

Identifier

Package: INSPIRE Consolidated UML Model::Generic Conceptual Model::Base Types::Base Types [Include reference to the document that includes the package, e.g. INSPIRE data specification, ISO standard or the GCM]
Definition: External unique object identifier published by the responsible body, which may be used by external applications to reference the spatial object.
Description: **NOTE1** External object identifiers are distinct from thematic object identifiers.

NOTE 2 The voidable version identifier attribute is not part of the unique identifier of a spatial object and may be used to distinguish two versions of the same spatial object.

NOTE 3 The unique identifier will not change during the life-time of a spatial object.

5.2.3.2.8. LandUseClassificationValue

LandUseClassificationValue (abstract)

Package: INSPIRE Consolidated UML Model::Themes::Annex III::Land Use::Land Use Nomenclature [Include reference to the document that includes the package, e.g. INSPIRE data specification, ISO standard or the GCM]
Definition: List of land use categories to be used in INSPIRE Land Use and agreed at a national or local level.
Description: This CodeList is empty in the INSPIRE context and must be extended by each data provider in their nationalcodeList register.

5.2.3.2.9. SpecificPresence

SpecificPresence

Package: INSPIRE Consolidated UML Model::Themes::Annex III::Land Use::Land Use Nomenclature [Include reference to the document that includes the package, e.g. INSPIRE data specification, ISO standard or the GCM]

INSPIRE	Reference: D2.8.III.4_v2.9		
TWG-LU	Data Specification on <i>Land Use</i>	2012-02-23	Page 46

SpecificPresence

Definition:	Indication of the presence of a land use classification value according to the code list provided by the data provider. If a percentage is provided it indicates the percentage of this specific use in this object. The specific presence data type enables the provision of information on land uses inside one land use object in order to collect more than one land use existence perfectly identifiable by importance order or percentages.
Description:	NOTE 1: The order of land use value presence without percentages enable providing an order of dominance/importance of each land use present in the land use object NOTE 2: The sum of the percentages can be below 100%, or above. The order is provided according to the respective importance when the percentages are not known.

5.2.4 Feature catalogue Sampled Existing Land Use

Table 3 - Feature catalogue metadata

Feature catalogue name	INSPIRE feature catalogue Sampled Existing Land Use
Scope	Sampled Existing Land Use
Version number	2.9
Version date	2012-02-23
Definition source	INSPIRE data specification Sampled Existing Land Use

Table 4 - Types defined in the feature catalogue

Type	Package	Stereotypes	Section
ExistingLandUseSample	Sampled Existing Land Use	«featureType»	5.2.4.1.1
SampledExistingLandUseDataSet	Sampled Existing Land Use	«featureType»	5.2.4.1.2

5.2.4.1. Spatial object types

5.2.4.1.1. ExistingLandUseSample

ExistingLandUseSample	
Name:	existing land use sample
Definition:	Description of the existing land uses that is present at the specific location.
Status:	Proposed
Stereotypes:	«featureType»
Identifier:	null
Attribute: validTo	
Value type:	Date
Definition:	First date at which this version of this LandUseObject is valid in reality.
Multiplicity:	0..1
Stereotypes:	«voidable»
Attribute: location	
Value type:	GM_Point
Definition:	Location where the land use sample is taken.
Multiplicity:	1
Attribute: specificPresence	
Value type:	SpecificPresence
Definition:	Actual presence of a land use category within the object.
Multiplicity:	1

INSPIRE	Reference: D2.8.III.4_v2.9		
TWG-LU	Data Specification on <i>Land Use</i>	2012-02-23	Page 47

ExistingLandUseSample

Stereotypes: «voidable»

Attribute: beginLifespanVersion

Value type: DateTime

Definition: Date and time at which this version of the spatial object was inserted or changed in the spatial data set.

Multiplicity: 1

Stereotypes: «lifeCycleInfo,voidable»

Attribute: hilucsLandUse

Value type: HILUCSValue

Definition: Land use HILUCS classes that are present in this existing land use sample.

Description: NOTE The Sampled Existing Land Use model enables the provision of information on land uses inside one land use object. The ExistingLandUseObject may be associated with 1 to many HILUCSLandUse that represents the Land Uses for the polygon from the economical point of view. It makes possible the assignment of more than one HILUCSLandUse existences when they cannot be managed by HILUCSPresences.

Multiplicity: 1..*

Obligation: Technical Guidance (recommendation)

Attribute: observationDate

Name: Observation Date.

Value type: Date

Definition: The observation date associated to a description.

Description: Defines the observation date of the description. It could be the date of an aerial/satellital acquisition or a field survey. The observation date allows the user to have accurate date of when the description was made in the real word. In a database, not all object informations are necessarily captured at the same time.

Multiplicity: 1

Stereotypes: «voidable»

Attribute: endLifespanVersion

Value type: DateTime

Definition: Date and time at which this version of the spatial object was superseded or retired in the spatial data set.

Multiplicity: 0..1

Stereotypes: «lifeCycleInfo,voidable»

Attribute: inspireId

Value type: Identifier

Definition: External object identifier of the land use sample.

Description: An external object identifier is a unique object identifier published by the responsible body, which may be used by external applications to reference the spatial object. The identifier is an identifier of the spatial object, not an identifier of the real-world phenomenon.

Multiplicity: 1

Attribute: specificLandUse

Value type: LandUseClassificationValue

Definition: Land Use Category according to the nomenclature specific to this dataset.

Description: Reference to an entry in the classification that is part of the SpecificLandUseClassification provided by the data producer.

Multiplicity: 1..*

INSPIRE	Reference: D2.8.III.4_v2.9		
TWG-LU	Data Specification on <i>Land Use</i>	2012-02-23	Page 48

ExistingLandUseSample

Stereotypes: «voidable»
Obligation: Technical Guidance (recommendation)

Attribute: validFrom

Value type: Date
Definition: The time when the phenomenon started to exist in the real world.
Multiplicity: 0..1
Stereotypes: «voidable»

Attribute: hilucsPresence

Name: land use presence
Value type: HILUCSPresence
Definition: Actual presence of a land use category according to HILUCS within the object.
Multiplicity: 1
Stereotypes: «voidable»

Association role: dataset

Value type: SampledExistingLandUseDataSet
Definition: Data set to which this sample belongs.
Multiplicity: 1

5.2.4.1.2. SampledExistingLandUseDataSet

SampledExistingLandUseDataSet

Name: sampled existing land use data set
Definition: An sampled existing land use data set is a collection of locations for which information on existing (present or past) land uses is provided.
Status: Proposed
Stereotypes: «featureType»
Identifier: null

Attribute: beginLifespanVersion

Value type: DateTime
Definition: Date and time at which this version of the spatial object was inserted or changed in the spatial data set.
Multiplicity: 1
Stereotypes: «lifeCycleInfo,voidable»

Attribute: endLifespanVersion

Value type: DateTime
Definition: Date and time at which this version of the spatial object was superseded or retired in the spatial data set.
Multiplicity: 0..1
Stereotypes: «lifeCycleInfo,voidable»

Attribute: extent

Value type: GM_MultiSurface
Definition: The convex hull of all the instances of the feature type ExistingLandUseSample.
Multiplicity: 1

Attribute: name

Value type: CharacterString
Definition: Human readable name of the dataset.
Multiplicity: 1

INSPIRE	Reference: D2.8.III.4_v2.9		
TWG-LU	Data Specification on <i>Land Use</i>	2012-02-23	Page 49

SampledExistingLandUseDataSet

Attribute: validFrom

Value type:	Date
Definition:	First date at which this data set is valid in reality.
Multiplicity:	0..1
Stereotypes:	«voidable»

Attribute: validTo

Value type:	Date
Definition:	The time from which the data set no longer exists in the real world.
Multiplicity:	0..1
Stereotypes:	«voidable»

Attribute: inspireId

Value type:	Identifier
Definition:	External object identifier of the sampled land use data set.
Description:	NOTE An external object identifier is a unique object identifier published by the responsible body, which may be used by external applications to reference the spatial object. The identifier is an identifier of the spatial object, not an identifier of the real-world phenomenon.
Multiplicity:	1

Association role: member

Value type:	ExistingLandUseSample
Definition:	Reference to the members of the sampled existing land use data set.
Multiplicity:	0..*

5.2.4.2. Imported types (informative)

This section lists definitions for feature types, data types and enumerations and code lists that are defined in other application schemas. The section is purely informative and should help the reader understand the feature catalogue presented in the previous sections. For the normative documentation of these types, see the given references.

5.2.4.2.1. CharacterString

CharacterString

Package:	INSPIRE Consolidated UML Model::Foundation Schemas::ISO TC211::ISO 19103:2005 Schema Language::Basic Types::Primitive::Text [Include reference to the document that includes the package, e.g. INSPIRE data specification, ISO standard or the GCM]
----------	---

5.2.4.2.2. Date

Date

Package:	INSPIRE Consolidated UML Model::Foundation Schemas::ISO TC211::ISO 19103:2005 Schema Language::Basic Types::Primitive::Date and Time [Include reference to the document that includes the package, e.g. INSPIRE data specification, ISO standard or the GCM]
----------	--

5.2.4.2.3. DateTime

DateTime

Package:	INSPIRE Consolidated UML Model::Foundation Schemas::ISO TC211::ISO 19103:2005 Schema Language::Basic Types::Primitive::Date and Time [Include reference to the document that includes the package, e.g. INSPIRE data specification, ISO standard or the GCM]
----------	--

5.2.4.2.4. GM_MultiSurface

GM_MultiSurface

INSPIRE	Reference: D2.8.III.4_v2.9		
TWG-LU	Data Specification on <i>Land Use</i>	2012-02-23	Page 50

GM_MultiSurface

Package: INSPIRE Consolidated UML Model::Foundation Schemas::ISO TC211::ISO 19107:2003 Spatial Schema:: Geometry::Geometric aggregates [Include reference to the document that includes the package, e.g. INSPIRE data specification, ISO standard or the GCM]

5.2.4.2.5. *GM_Point*

GM_Point

Package: INSPIRE Consolidated UML Model::Foundation Schemas::ISO TC211::ISO 19107:2003 Spatial Schema:: Geometry::Geometric primitive [Include reference to the document that includes the package, e.g. INSPIRE data specification, ISO standard or the GCM]

5.2.4.2.6. *HILUCSPresence*

HILUCSPresence

Package: INSPIRE Consolidated UML Model::Themes::Annex III::Land Use::Land Use Nomenclature [Include reference to the document that includes the package, e.g. INSPIRE data specification, ISO standard or the GCM]

Definition: presence of a HILUCS value in an area where there are several values together with a percentage. A void value for percentage means that it is unknown.

Description: The HILUCS presence data type enables the provision of information on land uses inside one land use object in order to collect more than one land use existence perfectly identifiable by importance order or percentages.
NOTE 1: The order of land use value presence without percentages enable providing an order of dominance/importance of each land use present in the land use object
NOTE 2: The sum of the percentages can be below 100%, or above. The order is provided according to the respective importance when the percentages are not known.

5.2.4.2.7. *HILUCSValue*

HILUCSValue

Package: INSPIRE Consolidated UML Model::Themes::Annex III::Land Use::Land Use Nomenclature [Include reference to the document that includes the package, e.g. INSPIRE data specification, ISO standard or the GCM]

Definition: List of land use categories to be used in INSPIRE Land Use and agreed at the European level.

Description: This list is populated with the land use categories of the Hierarchical INSPIRE Land Use Classification System.

The elements of the list should be both applicable to existing land use and planned land use.

5.2.4.2.8. *Identifier*

Identifier

Package: INSPIRE Consolidated UML Model::Generic Conceptual Model::Base Types::Base Types [Include reference to the document that includes the package, e.g. INSPIRE data specification, ISO standard or the GCM]

Definition: External unique object identifier published by the responsible body, which may be used by external applications to reference the spatial object.

INSPIRE	Reference: D2.8.III.4_v2.9		
TWG-LU	Data Specification on <i>Land Use</i>	2012-02-23	Page 51

Identifier

- Description: NOTE1 External object identifiers are distinct from thematic object identifiers.
- NOTE 2 The voidable version identifier attribute is not part of the unique identifier of a spatial object and may be used to distinguish two versions of the same spatial object.
- NOTE 3 The unique identifier will not change during the life-time of a spatial object.

5.2.4.2.9. *LandUseClassificationValue*

LandUseClassificationValue (abstract)

- Package: INSPIRE Consolidated UML Model::Themes::Annex III::Land Use::Land Use Nomenclature [Include reference to the document that includes the package, e.g. INSPIRE data specification, ISO standard or the GCM]
- Definition: List of land use categories to be used in INSPIRE Land Use and agreed at a national or local level.
- Description: This CodeList is empty in the INSPIRE context and must be extended by each data provider in their nationalcodeList register.

5.2.4.2.10. *SpecificPresence*

SpecificPresence

- Package: INSPIRE Consolidated UML Model::Themes::Annex III::Land Use::Land Use Nomenclature [Include reference to the document that includes the package, e.g. INSPIRE data specification, ISO standard or the GCM]
- Definition: Indication of the presence of a land use classification value according to the code list provided by the data provider. If a percentage is provided it indicates the percentage of this specific use in this object. The specific presence data type enables the provision of information on land uses inside one land use object in order to collect more than one land use existence perfectly identifiable by importance order or percentages.
- Description: NOTE 1: The order of land use value presence without percentages enable providing an order of dominance/importance of each land use present in nthe land use object
NOTE 2: The sum of the percentages can be below 100%, or above. The order is provided according to the respective importance when the percentages are not known.

5.2.5 Feature catalogue Gridded Existing Land Use

Table 3 - Feature catalogue metadata

Feature catalogue name	INSPIRE feature catalogue Gridded Existing Land Use
Scope	Gridded Existing Land Use
Version number	2.9
Version date	2012-02-23
Definition source	INSPIRE data specification Gridded Existing Land Use

Table 4 - Types defined in the feature catalogue

Type	Package	Stereotypes	Section
ExistingLandUseGrid	Gridded Existing Land Use	«featureType»	5.2.5.1.1

INSPIRE	Reference: D2.8.III.4_v2.9		
TWG-LU	Data Specification on <i>Land Use</i>	2012-02-23	Page 52

5.2.5.1. Spatial object types

5.2.5.1.1. ExistingLandUseGrid

ExistingLandUseGrid

Name:	existing land use grid
Subtype of:	RectifiedGridCoverage
Definition:	An existing land use grid is a collection of pixels for which information on existing (present or past) land use is provided. The HILUCS system shall be used for classification.
Status:	Proposed
Stereotypes:	«featureType»
Identifier:	null

Attribute: beginLifespanVersion

Value type:	DateTime
Definition:	Date and time at which this version of the spatial object was inserted or changed in the spatial data set.
Multiplicity:	1
Stereotypes:	«lifeCycleInfo,voidable»

Attribute: endLifespanVersion

Value type:	DateTime
Definition:	Date and time at which this version of the spatial object was superseded or retired in the spatial data set.
Multiplicity:	0..1
Stereotypes:	«lifeCycleInfo,voidable»

Attribute: footprint

Value type:	GM_MultiSurface
Definition:	Geographic area enclosing valid data of the land use data set.
Multiplicity:	1
Stereotypes:	«voidable»

Attribute: name

Value type:	CharacterString
Definition:	Human readable name of the dataset.
Multiplicity:	1

Attribute: validFrom

Value type:	Date
Definition:	First date at which this data set is valid in reality.
Multiplicity:	0..1
Stereotypes:	«voidable»

Attribute: validTo

Value type:	Date
Definition:	The time from which the data set no longer exists in the real world.
Multiplicity:	0..1
Stereotypes:	«voidable»

Constraint: rangeIsCategoryOrNil

Natural language:	rangeSet values are of type CategoryOrNilReason NOTE:Range is based on HILUCS or (exclusive) it is based on specific land use classification sytem defined by the data provider
OCL:	inv: rangeSet.forAll(oclIsKindOf(CategoryOrNilReason))

INSPIRE	Reference: D2.8.III.4_v2.9		
TWG-LU	Data Specification on <i>Land Use</i>	2012-02-23	Page 53

5.2.5.2. Imported types (informative)

This section lists definitions for feature types, data types and enumerations and code lists that are defined in other application schemas. The section is purely informative and should help the reader understand the feature catalogue presented in the previous sections. For the normative documentation of these types, see the given references.

5.2.5.2.1. *CharacterString*

CharacterString	
Package:	INSPIRE Consolidated UML Model::Foundation Schemas::ISO TC211::ISO 19103:2005 Schema Language::Basic Types::Primitive::Text [Include reference to the document that includes the package, e.g. INSPIRE data specification, ISO standard or the GCM]

5.2.5.2.2. *Date*

Date	
Package:	INSPIRE Consolidated UML Model::Foundation Schemas::ISO TC211::ISO 19103:2005 Schema Language::Basic Types::Primitive::Date and Time [Include reference to the document that includes the package, e.g. INSPIRE data specification, ISO standard or the GCM]

5.2.5.2.3. *DateTime*

DateTime	
Package:	INSPIRE Consolidated UML Model::Foundation Schemas::ISO TC211::ISO 19103:2005 Schema Language::Basic Types::Primitive::Date and Time [Include reference to the document that includes the package, e.g. INSPIRE data specification, ISO standard or the GCM]

5.2.5.2.4. *GM_MultiSurface*

GM_MultiSurface	
Package:	INSPIRE Consolidated UML Model::Foundation Schemas::ISO TC211::ISO 19107:2003 Spatial Schema:: Geometry::Geometric aggregates [Include reference to the document that includes the package, e.g. INSPIRE data specification, ISO standard or the GCM]

5.2.5.2.5. *RectifiedGridCoverage*

RectifiedGridCoverage	
Package:	INSPIRE Consolidated UML Model::Generic Conceptual Model::Base Models::Coverages::Coverages (Domain and Range) [Include reference to the document that includes the package, e.g. INSPIRE data specification, ISO standard or the GCM]
Definition:	coverage whose domain consists of a rectified grid
Description:	A rectified grid is a grid for which there is an affine transformation between the grid coordinates and the coordinates of a coordinate reference system.
NOTE This type can be used for both discrete and continuous coverages.	

5.2.6 Feature catalogue Planned Land Use

Table 3 - Feature catalogue metadata

Feature catalogue name	INSPIRE feature catalogue Planned Land Use
Scope	Planned Land Use
Version number	2.9
Version date	2012-02-23
Definition source	INSPIRE data specification Planned Land Use

Table 4 - Types defined in the feature catalogue

Type	Package	Stereotypes	Section
BackgroundMapValue	Planned Land Use	«dataType»	5.2.6.2.1
DimensioningIndicationCharacterValue	Planned Land Use	«dataType»	5.2.6.2.2
DimensioningIndicationIntegerValue	Planned Land Use	«dataType»	5.2.6.2.3
DimensioningIndicationMeasureValue	Planned Land Use	«dataType»	5.2.6.2.4
DimensioningIndicationRealValue	Planned Land Use	«dataType»	5.2.6.2.5
DimensioningIndicationValue	Planned Land Use	«dataType»	5.2.6.2.6
Document	Planned Land Use	«dataType»	5.2.6.2.7
LevelOfSpatialPlanValue	Planned Land Use	«enumeration»	5.2.6.3.1
OfficialDocumentation	Planned Land Use	«featureType»	5.2.6.1.1
OrdinanceValue	Planned Land Use	«dataType»	5.2.6.2.8
PlanTypeNameValue	Planned Land Use	«codeList»	5.2.6.4.1
ProcessStepGeneralValue	Planned Land Use	«enumeration»	5.2.6.3.2
RegulationNatureValue	Planned Land Use	«enumeration»	5.2.6.3.3
SpatialPlan	Planned Land Use	«featureType»	5.2.6.1.2
SpecificSupplementaryRegulationValue	Planned Land Use	«codeList»	5.2.6.4.2
SupplementaryRegulation	Planned Land Use	«featureType»	5.2.6.1.3
SupplementaryRegulationValue	Planned Land Use	«codeList»	5.2.6.4.3
ZoningElement	Planned Land Use	«featureType»	5.2.6.1.4

5.2.6.1. Spatial object types

5.2.6.1.1. OfficialDocumentation

OfficialDocumentation	
Name:	official documentation
Definition:	The official documentation that composes the spatial plan; it may be composed of, the applicable legislation, the regulations, cartographic elements, descriptive elements that may be associated with the complete spatial plan, a zoning element or a supplementary regulation . In some member states the actual textual regulation will be part of the data set(and can be put in the regulation text attribute) in other member states the text will not be part of the data set and be referenced via a URL or a reference to a legal act. At least one of the three voidable values should be provided.
Description:	NOTE: The LegislationReference is the value type of the attribute regulation reference. An example of a regulation reference would be: http://www2.vlaanderen.be/ruimtelijk/grup/00350/00362_00001/data/212_00362_00001_d_0BVR.pdf .
Status:	Proposed
Stereotypes:	«featureType»
Identifier:	null
Attribute: regulationReference	
Value type:	LegislationReference
Definition:	Reference to the document that contains the text of the regulation.
Multiplicity:	1
Stereotypes:	«voidable»
Attribute: regulationText	
Value type:	CharacterString
Definition:	Text of the regulation.
Multiplicity:	1
Stereotypes:	«voidable»

INSPIRE	Reference: D2.8.III.4_v2.9		
TWG-LU	Data Specification on <i>Land Use</i>	2012-02-23	Page 55

Official Documentation

Attribute: inspireId

Value type:	Identifier
Definition:	External object identifier of this spatial textual regulation.
Description:	NOTE An external object identifier is a unique object identifier published by the responsible body, which may be used by external applications to reference the spatial object. The identifier is an identifier of the spatial object, not an identifier of the real-world phenomenon.
Multiplicity:	1

Attribute: planDocument

Value type:	Document
Definition:	Scanned plans and structural drawings sometimes geo-referenced sometimes not. Rasters pictures vector drawings or scanned text.
Multiplicity:	1
Stereotypes:	«voidable»

Constraint: OneMustBeFilled

Natural language:	** At least one of the values must be populated with a non-void value
OCL:	

5.2.6.1.2. SpatialPlan

SpatialPlan

Name:	spatial plan
Definition:	a set of documents that indicates a strategic direction for the development of a given geographic area, states the policies, priorities, programmes and land allocations that will implement the strategic direction and influences the distribution of people and activities in spaces of various scales. A spatial plan includes all levels of planning land use including urban planning, regional planning, environmental planning, landscape planning, national spatial plans, and spatial planning at the European Union levels.
Status:	Proposed
Stereotypes:	«featureType»
Identifier:	null

Attribute: processStepGeneral

Value type:	ProcessStepGeneralValue
Definition:	General indication of the step of the planning process that the plan is undergoing.
Description:	NOTE This enumeration contains values that are common to most planning systems.
Multiplicity:	1
Stereotypes:	«voidable»

Attribute: validFrom

Value type:	Date
Definition:	First date at which this spatial plan is valid in reality.
Multiplicity:	0..1
Stereotypes:	«voidable»

Attribute: alternativeTitle

Value type:	CharacterString
Definition:	Alternative (unofficial) title of the spatial plan.
Multiplicity:	1

INSPIRE	Reference: D2.8.III.4_v2.9		
TWG-LU	Data Specification on <i>Land Use</i>	2012-02-23	Page 56

SpatialPlan

Stereotypes: «voidable»

Attribute: validTo

Value type: Date
Definition: The time from which the spatial plan no longer exists in the real world.
Multiplicity: 0..1
Stereotypes: «voidable»

Attribute: backgroundMap

Name background map
Value type: BackgroundMapValue
Definition: Identification of the background map that has been used for constructing this Plan.
Multiplicity: 1
Stereotypes: «voidable»

Attribute: inspireId

Value type: Identifier
Definition: External object identifier of the spatial plan.
Description: NOTE An external object identifier is a unique object identifier published by the responsible body, which may be used by external applications to reference the spatial object. The identifier is an identifier of the spatial object, not an identifier of the real-world phenomenon.
Multiplicity: 1

Attribute: beginLifespanVersion

Value type: DateTime
Definition: Date and time at which this version of the spatial object was inserted or changed in the spatial data set.
Multiplicity: 1
Stereotypes: «lifeCycleInfo,voidable»

Attribute: levelOfSpatialPlan

Name level of spatial plan
Value type: LevelOfSpatialPlanValue
Definition: level of the administrative units covered by the plan.
Description: Member states should make a mapping to this enumeration.
Multiplicity: 1

Attribute: endLifespanVersion

Value type: DateTime
Definition: Date and time at which this version of the spatial object was superseded or retired in the spatial data set.
Multiplicity: 0..1
Stereotypes: «lifeCycleInfo,voidable»

Attribute: extent

Value type: GM_MultiSurface
Definition: Geometrical union of all the instances of the featureTypes ZoningElement and SupplementaryRegulation. When a SpatialPlan is only composed of a document, the attribute extent is the border of the cartographic image that contains the land use information (i.e. the land use map extent) .
Multiplicity: 1

Attribute: ordinance

INSPIRE	Reference: D2.8.III.4_v2.9		
TWG-LU	Data Specification on <i>Land Use</i>	2012-02-23	Page 57

SpatialPlan

Value type:	OrdinanceValue
Definition:	Reference to relevant administrative ordinance.
Description:	NOTE This attribute is multiple because, independently from the current legal status of the plan, there can be references to more than one ordinance, in relation to the different steps that the planning process has already undergone (e.g. ordinance for the preparation of a new plan, ordinance of adoption, ordinance of approval, etc.).
Multiplicity:	1..*
Stereotypes:	«voidable»

Attribute: officialTitle

Value type:	CharacterString
Definition:	Official title of the spatial plan.
Multiplicity:	1

Attribute: planTypeName

Value type:	PlanTypeName
Definition:	Name of the type of plan that the member state gives to the plan.
Description:	NOTE The admissible values for this attribute are managed at the member state level via a code list EXAMPLE: FR: DTA, SCOT, PLU, etc. DE: Bebauungsplan, Flächennutzungsplan, Regionalplan, Landesentwicklungsplan NL: bestemmingsplan, structuurvisie.
Multiplicity:	1
Obligation:	Technical Guidance (recommendation)

Association role: officialDocument

Value type:	OfficialDocumentation
Definition:	Link to the official documents that relates to the spatial plan.
Multiplicity:	1..*
Stereotypes:	«voidable»

Association role: member

Value type:	ZoningElement
Multiplicity:	0..*

Association role: restriction

Value type:	SupplementaryRegulation
Definition:	Links to regulations that supplements the regulation of the zoning as part of this spatial plan.
Multiplicity:	0..*

5.2.6.1.3. SupplementaryRegulation

SupplementaryRegulation

Name:	supplementary regulation
Definition:	A geographic feature (point , line or polygon) that provides supplementary information and/or limitation on the use of land/water. The supplementary regulations can be for spatial planning reasons or due to the need to formalise external regulations.

INSPIRE	Reference: D2.8.III.4_v2.9		
TWG-LU	Data Specification on <i>Land Use</i>	2012-02-23	Page 58

SupplementaryRegulation

Description:	NOTE the supplementary regulations affects all land use that overlap with the geometry EXAMPLE an air field generates restriction in its surroundings regarding aircraft landing, radar and telecommunication devices. It is the buffer around these artefacts that generates the supplementary regulation on the Land Use.
Status:	Proposed
Stereotypes:	«featureType»
Identifier:	null

Attribute: specificRegulationNature

Value type:	CharacterString
Definition:	On member state level the legal classification for plan regulations may be complex. A supplementary regulation may be principally "bindingOnlyForAuthorities" but according to national law this regulation have to be more specified to explain the specific degree of binding. (e.g. on state or regional planning level in Germany: principles of spatial planning, other spatial planning requirements or goals of spatial planning)
Multiplicity:	1
Stereotypes:	«voidable»

Attribute: inheritedFromOtherPlans

Name	inherited from other plans
Value type:	boolean
Definition:	Indicates whether this regulation is inherited from another spatial plan.
Multiplicity:	1
Stereotypes:	«voidable»
Obligation:	null

Attribute: beginLifespanVersion

Value type:	DateTime
Definition:	Date and time at which this version of the spatial object was inserted or changed in the spatial data set.
Multiplicity:	1
Stereotypes:	«lifeCycleInfo,voidable»

Attribute: dimensioningIndication

Value type:	DimensioningIndicationValue
Definition:	Specifications about the dimensioning that are added to the dimensioning of the zoning elements that overlap the geometry of the supplementary regulation.
Multiplicity:	0..*
Stereotypes:	«voidable»

Attribute: endLifespanVersion

Value type:	DateTime
Definition:	Date and time at which this version of the spatial object was superseded or retired in the spatial data set.
Multiplicity:	0..1
Stereotypes:	«lifeCycleInfo,voidable»

Attribute: geometry

Value type:	GM_Object
Definition:	Geometry of the piece of land on which the supplementary regulation applies.
Multiplicity:	1

Attribute: inspireId

INSPIRE	Reference: D2.8.III.4_v2.9		
TWG-LU	Data Specification on <i>Land Use</i>	2012-02-23	Page 59

SupplementaryRegulation

Value type:	Identifier
Definition:	External object identifier of the spatial object.
Description:	NOTE An external object identifier is a unique object identifier published by the responsible body, which may be used by external applications to reference the spatial object. The identifier is an identifier of the spatial object, not an identifier of the real-world phenomenon.
Multiplicity:	1

Attribute: specificSupplementaryRegulation

Value type:	SpecificSupplementaryRegulationValue
Definition:	Reference to a category of supplementary regulation provided in a specific nomenclature of supplementary regulations provided by the data provider.
Multiplicity:	1..*
Stereotypes:	«voidable»
Obligation:	Technical Guidance (recommendation)

Attribute: regulationNature

Value type:	RegulationNatureValue
Definition:	Legal nature of the land use regulation.
Description:	NOTE Indicates whether the land use regulation is legally binding or not.
Multiplicity:	1

Attribute: supplementaryRegulation

Value type:	SupplementaryRegulationValue
Definition:	Code of the supplementary regulation from the hierarchical supplementary regulation code list agreed at the European level.
Multiplicity:	1..*
Obligation:	Technical Guidance (recommendation)

Attribute: processStepGeneral

Value type:	ProcessStepGeneralValue
Definition:	General indication of the step of the planning process that the supplementary regulation is undergoing.
Description:	NOTE This enumeration contains values that are common to most planning systems.
Multiplicity:	1
Stereotypes:	«voidable»

Attribute: validFrom

Value type:	Date
Definition:	First date at which this version of this supplementary regulation is valid in reality.
Multiplicity:	0..1
Stereotypes:	«voidable»

Attribute: validTo

Value type:	Date
Definition:	The date from which the supplementary regulation is no longer valid.
Multiplicity:	0..1
Stereotypes:	«voidable»

Attribute: backgroundMap

Name	background map
Value type:	BackgroundMapValue

INSPIRE	Reference: D2.8.III.4_v2.9		
TWG-LU	Data Specification on <i>Land Use</i>	2012-02-23	Page 60

SupplementaryRegulation

Definition: Identification of the background map that has been used for constructing this supplementary regulation.

Multiplicity: 1

Stereotypes: «voidable»

Attribute: name

Value type: CharacterString

Definition: Official name of the supplementary regulation

Multiplicity: 0..*

Stereotypes: «voidable»

Association role: officialDocument

Value type: OfficialDocumentation

Definition: Link to the Textual regulations that corresponds to this supplementary regulation.

Multiplicity: 1..*

Stereotypes: «voidable»

Association role: plan

Value type: SpatialPlan

Definition: Link to the plan this supplementary regulation is part of.

Multiplicity: 1

5.2.6.1.4. ZoningElement

ZoningElement

Name: zoning element

Definition: a geographical feature which is homogeneous regarding the permitted uses of land based on zoning which separate one set of land uses from another.

Description: Zoning elements refer to the regulation of the kinds of activities which will be acceptable on particular lots (such as open space, residential, agricultural, commercial or industrial). The intensity of use at which those activities can be performed (from low-density housing such as single family homes to high-density such as high-rise apartment buildings), the height of buildings, the amount of space that structures may occupy, the proportions of the types of space on a lot, such as how much landscaped space, impervious surface, traffic lanes, and parking may be provided.

Status: Proposed

Stereotypes: «featureType»

Identifier: null

Attribute: hilucsPresence

Name: land use presence

Value type: HILUCSPresence

Definition: Actual presence of a land use category within the object.

Multiplicity: 1

Stereotypes: «voidable»

Attribute: regulationNature

Value type: RegulationNatureValue

Definition: Legal nature of the land use indication.

Description: NOTE Indicates whether the land use indication is legally binding or not.

Multiplicity: 1

Attribute: endLifespanVersion

Value type: DateTime

INSPIRE	Reference: D2.8.III.4_v2.9		
TWG-LU	Data Specification on <i>Land Use</i>	2012-02-23	Page 61

ZoningElement

Definition: Date and time at which this version of the spatial object was superseded or retired in the spatial data set.

Multiplicity: 0..1

Stereotypes: «lifeCycleInfo,voidable»

Attribute: inspireId

Value type: Identifier

Definition: External object identifier of the spatial object.

Description: An external object identifier is a unique object identifier published by the responsible body, which may be used by external applications to reference the spatial object. The identifier is an identifier of the spatial object, not an identifier of the real-world phenomenon.

Multiplicity: 1

Attribute: specificLandUse

Value type: LandUseClassificationValue

Definition: Land Use Category according to the nomenclature specific to this dataset.

Description: Reference to an entry in the classification that is part of the SpecificLandUseClassification.

Multiplicity: 1..*

Stereotypes: «voidable»

Obligation: Technical Guidance (recommendation)

Attribute: validFrom

Value type: Date

Definition: The time when the phenomenon started to exist in the real world.

Multiplicity: 0..1

Stereotypes: «voidable»

Attribute: validTo

Value type: Date

Definition: First date at which this version of this LandUseObject is valid in reality.

Multiplicity: 0..1

Stereotypes: «voidable»

Attribute: processStepGeneral

Value type: ProcessStepGeneralValue

Definition: General indication of the step of the planning process that the zoning element is undergoing.

Description: NOTE This enumeration contains values that are common to most planning systems.

Multiplicity: 1

Stereotypes: «voidable»

Attribute: backgroundMap

Name: background map

Value type: BackgroundMapValue

Definition: Identification of the background map that has been used for constructing this zoning element.

Multiplicity: 1

Stereotypes: «voidable»

Attribute: specificPresence

Name: land use presence

INSPIRE	Reference: D2.8.III.4_v2.9		
TWG-LU	Data Specification on <i>Land Use</i>	2012-02-23	Page 62

ZoningElement

Value type: SpecificPresence
Definition: Actual presence of a land use category within the object.
Multiplicity: 1
Stereotypes: «voidable»

Attribute: geometry

Value type: GM_MultiSurface
Multiplicity: 1

Attribute: beginLifespanVersion

Value type: DateTime
Definition: Date and time at which this version of the spatial object was inserted or changed in the spatial data set.
Multiplicity: 1
Stereotypes: «lifeCycleInfo,voidable»

Attribute: dimensioningIndication

Value type: DimensioningIndicationValue
Definition: Specifications about the dimensioning of the urban developments.
Multiplicity: 0..*
Stereotypes: «voidable»

Attribute: hilucsLandUse

Value type: HILUCSValue
Definition: Land use class that is dominant in this land use object.
Multiplicity: 1..*
Obligation: Technical Guidance (recommendation)

Association role: plan

Value type: SpatialPlan
Multiplicity: 1

Association role: officialDocument

Value type: OfficialDocumentation
Definition: Textual Regulation that is part of this zoning element.
Multiplicity: 1..*
Stereotypes: «voidable»

5.2.6.2. Data types

5.2.6.2.1. BackgroundMapValue

BackgroundMapValue

Name: Background Map Value
Definition: Information regarding the map that has been used as a background in the definition of a spatial plan, a zoning element of a supplementary regulation.
Status: Proposed
Stereotypes: «dataType»
Identifier: null

Attribute: backgroundMapURI

Name: background map URI
Value type: URI
Definition: URI referring to service that provides background map.
Multiplicity: 1

INSPIRE	Reference: D2.8.III.4_v2.9		
TWG-LU	Data Specification on <i>Land Use</i>	2012-02-23	Page 63

BackgroundMapValue

Stereotypes: «voidable»

Attribute: backgroundMapDate

Name: background map date
Value type: DateTime
Definition: Date of the background map used.
Multiplicity: 1

Attribute: backgroundMapReference

Value type: CharacterString
Definition: Reference to the background map that has been used.
Multiplicity: 1

5.2.6.2.2. DimensioningIndicationCharacterValue

DimensioningIndicationCharacterValue

Name: dimension indication character value
Subtype of: DimensioningIndicationValue
Definition: Dimensioning indication of which the value is of type CharacterString.
Status: Proposed
Stereotypes: «dataType»
Identifier: null

Attribute: value

Value type: CharacterString
Definition: value of the dimension indications.
Multiplicity: 1

5.2.6.2.3. DimensioningIndicationIntegerValue

DimensioningIndicationIntegerValue

Name: dimension indication integer value
Subtype of: DimensioningIndicationValue
Definition: Dimensioning indication of which the value is of type integer.
Status: Proposed
Stereotypes: «dataType»
Identifier: null

Attribute: value

Value type: Integer
Multiplicity: 1

5.2.6.2.4. DimensioningIndicationMeasureValue

DimensioningIndicationMeasureValue

Name: dimension indication measure value
Subtype of: DimensioningIndicationValue
Definition: Dimensioning indication of which the value is a measure.
Status: Proposed
Stereotypes: «dataType»
Identifier: null

Attribute: value

Value type: Measure
Multiplicity: 1

INSPIRE	Reference: D2.8.III.4_v2.9		
TWG-LU	Data Specification on <i>Land Use</i>	2012-02-23	Page 64

5.2.6.2.5. *DimensioningIndicationRealValue*

DimensioningIndicationRealValue

Name:	dimension indication real value
Subtype of:	DimensioningIndicationValue
Definition:	Dimensioning indication of which the value is a floating point number.
Status:	Proposed
Stereotypes:	«dataType»
Identifier:	null

Attribute: value

Value type:	Real
Multiplicity:	1

5.2.6.2.6. *DimensioningIndicationValue*

DimensioningIndicationValue

Name:	Dimension Indication
Definition:	Specifications about the dimensioning of the urban developments.
Status:	Proposed
Stereotypes:	«dataType»
Identifier:	null

Attribute: indicationReference

Value type:	CharacterString
Definition:	Description of the dimension indication.
Multiplicity:	1

5.2.6.2.7. *Document*

Document

Name:	Document
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INSPIRE	Reference: D2.8.III.4_v2.9		
TWG-LU	Data Specification on <i>Land Use</i>	2012-02-23	Page 65

Document

Definition:	<p>Any external document containing textual information or imagery with further information. A document containing textual information could contain the textual regulations of a spatial plan itself (provided by making use of a file format being suitable as e.g. doc, odt and others), whereas a document containing imagery information could be the spatial plan itself (or just a structure drawing), namely being scanned and provided as raster data file. Provided raster data may hold some information on georeference. In this case the following alternatives are to be considered:</p> <ol style="list-style-type: none"> 1. One raster file and one further file containing information on georeference of the image in the raster file: The raster data is provided as a plain raster data file without any information on georeference. In this case the information on georeference shall be provided as a further external file referenced to by means of another "Document". This second external file preferably should be a file externally containing information on georeference such as a "word file" which "is a <i>plain text</i> computer <i>data file</i> used by <i>geographic information systems</i> to <i>georeference raster</i> map images" (→ . http://en.wikipedia.org/wiki/World_file). This type of file contains the transformation parameters of the transformation between world coordinates and image coordinates. Only this kind of externally provided information on georeference shall be allowed. 2. Just one raster data file with information on georeference being supplied inside the raster data file format. The raster data is provided as a raster data file even containing information on georeference itself. This can be fulfilled by using GeoTIFF as a raster file format. Therefore the raster data file itself contains the necessary information on georeference of the image data. Thus in this case it is not necessary to supply another (external) file externally containing information on georeference. As furthermore the internal structure of a GeoTIFF file is the same as for a plain tiff file, there is no special mimetype available for GeoTIFF files. For that reason the GIS system itself has to analyze whether the tiff data is even GeoTIFF data.
Status:	Proposed
Stereotypes:	«dataType»
Identifier:	null

Attribute: date

Value type:	DateTime
Definition:	Date when document was published.
Multiplicity:	0..1
Stereotypes:	«voidable»

Attribute: documentDescription

Value type:	CharacterString
Multiplicity:	0..1
Stereotypes:	«voidable»

Attribute: documentLink

Value type:	URI
Definition:	Reference to a resource where the Document can be found.
Multiplicity:	1

5.2.6.2.8. OrdinanceValue

OrdinanceValue

Name:	Ordinance Value
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OrdinanceValue

Status: Proposed
Stereotypes: «dataType»
Identifier: null

Attribute: ordinanceDate

Value type: DateTime
Definition: Date of the relevant administrative ordinance.
Description: NOTE This attribute is multiple because, independently from the current legal status of the plan, there can be references to the dates of more than one ordinance, in relation to the different steps that the planning process has already undergone (e.g. ordinance for the preparation of a new plan, ordinance of adoption, ordinance of approval, etc.).
Multiplicity: 1

Attribute: ordinanceReference

Value type: CharacterString
Definition: Reference to relevant administrative ordinance.
Description: NOTE This attribute is multiple because, independently from the current legal status of the plan, there can be references to more than one ordinance, in relation to the different steps that the planning process has already undergone (e.g. ordinance for the preparation of a new plan, ordinance of adoption, ordinance of approval, etc.).
Multiplicity: 1

5.2.6.3. Enumerations

5.2.6.3.1. LevelOfSpatialPlanValue

LevelOfSpatialPlanValue

Name: level of spatial plan
Definition: Territorial hierarchy of plan.
Status: Proposed
Stereotypes: «enumeration»
Identifier: null

Value: local

Definition: Plan at municipal level (equivalent to LAU2 of EUROSTAT nomenclature of statistical units).

Value: regional

Definition: Plan at regional level (equivalent to NUTS2 of EUROSTAT nomenclature of statistical units).

Value: national

Definition: Plan at Member State level.

Value: other

Definition: Other level of spatial plan.

Value: supraLocal

Definition: A plan that overlaps several municipalities (entirely or partially).

Value: supraRegional

Definition: A plan that overlaps several administrative regions.

Value: infraLocal

LevelOfSpatialPlanValue

Definition: A plan that covers only part of a municipality.

Value: infraRegional

Definition: A plan that overlaps several infra-administrative units in one administrative region.

5.2.6.3.2. ProcessStepGeneralValue

ProcessStepGeneralValue

Name: process step general

Definition: General indication of the step of the planning process that the plan is undergoing.

Description: NOTE This enumeration contains values that are common to most planning systems.

Status: Proposed

Stereotypes: «enumeration»

Identifier: null

Value: adoption

Definition: Plan in the process of being legally adopted.

Value: elaboration

Definition: Plan under elaboration.

Value: legalForce

Definition: Plan already adopted and being legally binding or active.

Value: obsolete

Definition: Plan having been substituted by another plan, or not being any longer in force.

5.2.6.3.3. RegulationNatureValue

RegulationNatureValue

Name: regulation nature

Definition: Legal nature of the land use indication.

Status: Proposed

Stereotypes: «enumeration»

Identifier: null

Value: definedInLegislation

Definition: The land use indication is defined by the legislation.

Value: bindingForDevelopers

Definition: The land use indication is binding only for the entity in charge of developing an area.

Value: bindingOnlyForAuthorities

Definition: The land use indication is binding only for certain authorities.

Value: generallyBinding

Definition: The land use indication is binding for everybody.

Value: nonBinding

Definition: The land use indication is not binding.

INSPIRE	Reference: D2.8.III.4_v2.9		
TWG-LU	Data Specification on <i>Land Use</i>	2012-02-23	Page 68

5.2.6.4. Code lists

5.2.6.4.1. *PlanTypeNameValue*

PlanTypeNameValue (abstract)

Name:	plan type name value
Definition:	The list of the plan type names is provided by the member states. It gives the list of spatial plans that will have to conform to Land Use data specification.
Description:	NOTE For each plantype a level of spatial plan must be provided.
Status:	Proposed
Stereotypes:	«codeList»
Extensibility:	any
Identifier:	

5.2.6.4.2. *SpecificSupplementaryRegulationValue*

SpecificSupplementaryRegulationValue (abstract)

Name:	specific supplementary regulation value
Definition:	This codeList is empty in the INSPIRE context and must be extended by each data provider in their own codeList register.
Status:	Proposed
Stereotypes:	«codeList»
Extensibility:	any
Identifier:	

5.2.6.4.3. *SupplementaryRegulationValue*

SupplementaryRegulationValue

Name:	supplementary regulation value
Definition:	Types of conditions and constraints in spatial plans.
Status:	Proposed
Stereotypes:	«codeList»
Extensibility:	none
Identifier:	http://inspire.ec.europa.eu/codeList/SupplementaryRegulationValue

5.2.6.5. Imported types (informative)

This section lists definitions for feature types, data types and enumerations and code lists that are defined in other application schemas. The section is purely informative and should help the reader understand the feature catalogue presented in the previous sections. For the normative documentation of these types, see the given references.

5.2.6.5.1. *CharacterString*

CharacterString

Package:	INSPIRE Consolidated UML Model::Foundation Schemas::ISO TC211::ISO 19103:2005 Schema Language::Basic Types::Primitive::Text [Include reference to the document that includes the package, e.g. INSPIRE data specification, ISO standard or the GCM]
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5.2.6.5.2. *Date*

Date

Package:	INSPIRE Consolidated UML Model::Foundation Schemas::ISO TC211::ISO 19103:2005 Schema Language::Basic Types::Primitive::Date and Time [Include reference to the document that includes the package, e.g. INSPIRE data specification, ISO standard or the GCM]
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5.2.6.5.3. *DateTime*

DateTime

INSPIRE	Reference: D2.8.III.4_v2.9		
TWG-LU	Data Specification on <i>Land Use</i>	2012-02-23	Page 69

DateTime

Package: INSPIRE Consolidated UML Model::Foundation Schemas::ISO TC211::ISO 19103:2005 Schema Language::Basic Types::Primitive::Date and Time [Include reference to the document that includes the package, e.g. INSPIRE data specification, ISO standard or the GCM]

5.2.6.5.4. *GM_MultiSurface*

GM_MultiSurface

Package: INSPIRE Consolidated UML Model::Foundation Schemas::ISO TC211::ISO 19107:2003 Spatial Schema:: Geometry::Geometric aggregates [Include reference to the document that includes the package, e.g. INSPIRE data specification, ISO standard or the GCM]

5.2.6.5.5. *GM_Object*

GM_Object (abstract)

Package: INSPIRE Consolidated UML Model::Foundation Schemas::ISO TC211::ISO 19107:2003 Spatial Schema:: Geometry::Geometry root [Include reference to the document that includes the package, e.g. INSPIRE data specification, ISO standard or the GCM]

5.2.6.5.6. *HILUCSPresence*

HILUCSPresence

Package: INSPIRE Consolidated UML Model::Themes::Annex III::Land Use::Land Use Nomenclature [Include reference to the document that includes the package, e.g. INSPIRE data specification, ISO standard or the GCM]

Definition: presence of a HILUCS value in an area where there are several values together with a percentage. A void value for percentage means that it is unknown.

Description: The HILUCS presence data type enables the provision of information on land uses inside one land use object in order to collect more than one land use existence perfectly identifiable by importance order or percentages.
NOTE 1: The order of land use value presence without percentages enable providing an order of dominance/importance of each land use present in the land use object
NOTE 2: The sum of the percentages can be below 100%, or above. The order is provided according to the respective importance when the percentages are not known.

5.2.6.5.7. *HILUCSValue*

HILUCSValue

Package: INSPIRE Consolidated UML Model::Themes::Annex III::Land Use::Land Use Nomenclature [Include reference to the document that includes the package, e.g. INSPIRE data specification, ISO standard or the GCM]

Definition: List of land use categories to be used in INSPIRE Land Use and agreed at the European level.

Description: This list is populated with the land use categories of the Hierarchical INSPIRE Land Use Classification System.

The elements of the list should be both applicable to existing land use and planned land use.

5.2.6.5.8. *Identifier*

Identifier

Package: INSPIRE Consolidated UML Model::Generic Conceptual Model::Base Types::Base Types [Include reference to the document that includes the package, e.g. INSPIRE data specification, ISO standard or the GCM]

Definition: External unique object identifier published by the responsible body, which may be used by external applications to reference the spatial object.

INSPIRE	Reference: D2.8.III.4_v2.9		
TWG-LU	Data Specification on <i>Land Use</i>	2012-02-23	Page 70

Identifier

- Description: NOTE1 External object identifiers are distinct from thematic object identifiers.
- NOTE 2 The voidable version identifier attribute is not part of the unique identifier of a spatial object and may be used to distinguish two versions of the same spatial object.
- NOTE 3 The unique identifier will not change during the life-time of a spatial object.

5.2.6.5.9. *Integer*

Integer

- Package: INSPIRE Consolidated UML Model::Foundation Schemas::ISO TC211::ISO 19103:2005 Schema Language::Basic Types::Primitive::Numerics [Include reference to the document that includes the package, e.g. INSPIRE data specification, ISO standard or the GCM]

5.2.6.5.10. *LandUseClassificationValue*

LandUseClassificationValue (abstract)

- Package: INSPIRE Consolidated UML Model::Themes::Annex III::Land Use::Land Use Nomenclature [Include reference to the document that includes the package, e.g. INSPIRE data specification, ISO standard or the GCM]
- Definition: List of land use categories to be used in INSPIRE Land Use and agreed at a national or local level.
- Description: This CodeList is empty in the INSPIRE context and must be extended by each data provider in their nationalcodeList register.

5.2.6.5.11. *LegislationCitation*

LegislationCitation

- Package: INSPIRE Consolidated UML Model::Generic Conceptual Model::Base Types::Base Types 2 [Include reference to the document that includes the package, e.g. INSPIRE data specification, ISO standard or the GCM]
- Definition: Citation to unambiguously reference a legal act or a specific part of a legal act.

5.2.6.5.12. *Measure*

Measure

- Package: INSPIRE Consolidated UML Model::Themes::Annex III::Production and Industrial Facilities::ProductionAndIndustrialFacilities [Include reference to the document that includes the package, e.g. INSPIRE data specification, ISO standard or the GCM]
- Definition: Declared or measured quantity of any kind of physical entity.

5.2.6.5.13. *Real*

Real

- Package: INSPIRE Consolidated UML Model::Foundation Schemas::ISO TC211::ISO 19103:2005 Schema Language::Basic Types::Primitive::Numerics [Include reference to the document that includes the package, e.g. INSPIRE data specification, ISO standard or the GCM]

5.2.6.5.14. *SpecificPresence*

SpecificPresence

- Package: INSPIRE Consolidated UML Model::Themes::Annex III::Land Use::Land Use Nomenclature [Include reference to the document that includes the package, e.g. INSPIRE data specification, ISO standard or the GCM]

INSPIRE	Reference: D2.8.III.4_v2.9		
TWG-LU	Data Specification on <i>Land Use</i>	2012-02-23	Page 71

SpecificPresence

Definition:	Indication of the presence of a land use classification value according to the code list provided by the data provider. If a percentage is provided it indicates the percentage of this specific use in this object. The specific presence data type enables the provision of information on land uses inside one land use object in order to collect more than one land use existence perfectly identifiable by importance order or percentages.
Description:	NOTE 1: The order of land use value presence without percentages enable providing an order of dominance/importance of each land use present in the land use object NOTE 2: The sum of the percentages can be below 100%, or above. The order is provided according to the respective importance when the percentages are not known.

5.2.6.5.15. URI

URI

Package:	INSPIRE Consolidated UML Model::Foundation Schemas::ISO TC211::ISO 19136 GML::basicTypes [Include reference to the document that includes the package, e.g. INSPIRE data specification, ISO standard or the GCM]
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5.2.7 INSPIRE-governed code lists

The INSPIRE-defined code lists included in this application schema include the values specified in the tables in this section.

5.2.7.1. Values of code list HILUCSValue

The same HILUCS nomenclature is used for Existing (ELU), Planned (PLU), Sampled (SELU) and Gridded (GELU) land use. Please note that there are classes which are normally only used either for existing or planned land use (for example 6.1 Transitional areas and 6.2 Abandoned areas are only for ELU, SELU or GELU and 6.4 Areas where any use allowed and 6.5 Areas without any specified planned use are applicable to PLU).

The mixed land use for ELU, PLU and SELU is recommended to be coded as multiple LandUsePresences, if possible indicating the percentages or the order of importance. However it is also possible to use the code 5.2 'Residential use with other compatible use' for mixtures of residential areas and other compatible areas (e.g. commercial, services etc.). As the mixed residential use (e.g. residential and commercial or service use) is a widely existing land use in urban areas and promoted in planning, it is present in the HILUCS level two although it forms an exception to the rule that classes should be mutually exclusive..

The most detailed level of the classification should be used. It is possible to mix the levels: e.g. if detailed data exists for services and not for industries, the third level should be used for services and only the second level for Industries. It is always recommended to use at least the second level of detail.

HILUCS is applicable for land use and it can also be used for water areas (inland and sea water areas) and seabed too. As the use categories for land and water are to a great extent similar¹⁸, water covered areas are classified according to their use (e.g. fishing, transport, mining, energy production, water areas not in any other use, etc.).

¹⁸ Comparison of sea and land uses is based among other things on the BALANCE-project Technical Summary Report 4/4. The BALANCE consortium composed of 27 partners from the Baltic Sea region assessed the marine spatial planning practices, tools and criteria.

HILUCS is an evolving classification. The present version is the starting point for HILUCS. It needs to be maintained and further elaborated. The maintenance consists of dividing existing classes into new sub-classes, merging classes, refining the content of existing classes and adding potentially missing classes. Land use classifications are moving towards object-oriented models with parameters describing the characteristics of objects. HILUCS should also be developed into that direction. In particular density parameters would be very useful for depicting the land use and analysing its environmental impacts. A working group could be created in co-operation with CEMAT (Council of Europe Conference of Ministers Responsible for Spatial/Regional Planning) and the European Commission.

Value	Definition	Parent value
1_PrimaryProduction	<p>This class includes areas where the production of goods is directly based on local natural resources. The primary sector transforms natural resources into primary products. Most products from this sector are either raw materials for other industries (e.g. food, metal, wood industry), or are directly consumed by end-users. Major subsectors of primary production are agriculture, animal husbandry, agribusiness, fishing, forestry and mining and quarrying activities</p> <p>Areas where the manufacturing industries aggregate, pack, package, purify or process the primary products close to the primary producers are normally considered to be included, especially if the raw material is unsuitable for sale or difficult to transport long distances.</p>	
1_1_Agriculture	<p>This class includes the production of crop (plants, fungi etc.) and animal products for food (for sale and for own consumption) and industrial purposes. This class includes also the growing of plants for biofuels. This class includes growing of crops in open fields as well as in greenhouses. Also set aside fallow land in the crop rotation belongs to this class. The preparation of products for the primary markets is included here. The class also includes field construction (e.g. agricultural land terracing, drainage, preparing rice paddies etc.) as well as landscape care and maintenance.</p>	1_PrimaryProduction
1_1_1_CommercialAgriculturalProduction	<p>This class includes arable land, permanent crops and grasslands in agricultural use (both sown and natural grassland). The products can be used for human or animal feed or bio-energy production.</p>	1_1_Agriculture
1_1_2_FarmingInfrastructure	<p>This class includes farm dwellings, animal husbandry infrastructure (animal dwellings and processing infrastructure linked to farms), manure storage and other farming infrastructure (e.g. buildings linked to plant handling and processing in farms).</p>	1_1_Agriculture
1_1_3_AgriculturalProductionForOwnConsumption	<p>This class includes land used for producing plants of animals for own consumption (kitchen gardens, private animal sheds etc.)</p>	1_1_Agriculture

INSPIRE	Reference: D2.8.III.4_v2.9		
TWG-LU	Data Specification on <i>Land Use</i>	2012-02-23	Page 73

1_2_Forestry	This class includes areas for the production of round wood and other wood based primary products. Besides the production of timber, forestry activities result in products that undergo little processing, such as firewood, charcoal and round wood used in an unprocessed form (e.g. pit-props, pulpwood etc.). Forest tree nurseries, storage and transport areas linked to logging belong to this class. This class includes also the growing of trees and woody plants for bio fuels. These activities can be carried out in natural or planted forests.	1_PrimaryProduction
1_2_1_ForestryBasedOnShortRotation	This class includes forestry areas where the rotation time of a tree generation is 50 years or less, after which the forest is regenerated naturally or artificially (with planting or seeding). Also tree plantations (pulp-wood production) and wood used for biomass production belong to this class.	1_2_Forestry
1_2_2_ForestryBasedOnIntermediateOrLongRotation	This class includes forestry areas where the rotation time of a tree generation is over 50 years after which the forest is regenerated naturally or artificially (with planting or seeding).	1_2_Forestry
1_2_3_ForestryBasedOnContinuousCover	This class includes forestry areas where forest management and regeneration is based on continuous growing of trees.	1_2_Forestry
1_3_Mining and quarrying	This class includes mining and quarrying in the form of the extraction of minerals and materials occurring naturally as solids (coal, ores, gravel, sand, salt), liquids (petroleum), gases (natural gas) or biomass (peat). Extraction can be achieved by different methods such as underground or surface mining or extraction, well operation etc.	1_PrimaryProduction
1_3_1_MiningOfEnergyProducingMaterials	This class includes the mining and extraction of coal, lignite, peat, petroleum, natural gas, uranium and thorium.	1_3_Mining and quarrying
1_3_2_MiningOfMetalOres	This class includes mining of iron and other non-ferrous metal ores (except uranium and thorium).	1_3_Mining and quarrying
1_3_3_OtherMiningAndQuarrying	This class includes the quarrying of stone, sand, clay, chemical, fertilizer minerals, the production of salt and other mining and quarrying.	1_3_Mining and quarrying
1_4_AquacultureAndFishing	This class includes professional fishing and aquaculture.	1_PrimaryProduction
1_4_1_Aquaculture	This class includes areas used for fish hatcheries and managed grow-out sites.	1_4_AquacultureAndFishing
1_4_2_ProfessionalFishing	This class includes water areas used for professional fishing	1_4_AquacultureAndFishing
1_5_OtherPrimaryProduction	This class includes professional hunting, gathering of wild growing non-wood forestry products, and husbandry of migratory animals.	1_PrimaryProduction
1_5_1_Hunting	This class includes areas used for professional hunting. The areas can be fenced or open.	1_5_OtherPrimaryProduction
1_5_2_ManagementOfMigratoryAnimals	This class includes the areas used for keeping and feeding migratory animals such as reindeer and deer	1_5_OtherPrimaryProduction
1_5_3_PickingOfNaturalProducts	This class includes areas which are used for picking up natural non wood based products such as not cultivated berries, mosses, lichen etc.) for commercial purposes.	1_5_OtherPrimaryProduction

INSPIRE	Reference: D2.8.III.4_v2.9		
TWG-LU	Data Specification on <i>Land Use</i>	2012-02-23	Page 74

1_5_4_OtherPrimaryproduction	This class includes the other primary production not included in the classes defined above.	1_5_OtherPrimaryProduction
2_SecondaryProduction	<p>This class includes industrial and manufacturing activities which take the output of the primary sector and manufacture finished goods and intermediate products for other business. This class also includes the storage and transport areas linked directly to manufacturing activities.</p> <p>The branches of industries covered by this class are the processing of: food, textile, leather, wood and wood product, pulp, paper, publishing, printing, recording, petroleum and other fuels, chemicals, chemical products, man-made fibers, rubber and plastic products, non metallic mineral products, basic metals and metal products, fabricated metal product, machinery and equipment, electrical and optical equipments, transport equipment and furniture.</p>	
2_1_RawIndustry	This class includes the industrial activities transforming the output primary sector into manufactured row products	2_SecondaryProduction
2_1_1_ManufacturingOfTextileProducts	This class includes areas used for the preparation and spinning of textile fibres, sewing threads, textile weaving, and for the tanning and dressing of leather,	2_1_RawIndustry
2_1_2_ManufacturingOfWoodAndWoodBasedProducts	This class includes the areas used for sawmilling and planning of wood, manufacturing of veneer sheets, plywood, laming boards, fibre boards, carpentry and joinery, cork, straw and plaiting products.	2_1_RawIndustry
2_1_3_ManufacturingOfPulp_PaperAndPaperProducts	This class includes the areas used for the manufacturing of pulp, paper, paperboard, paper based sanitary goods, wallpapers	2_1_RawIndustry
2_1_4_ManufacturingOfCoke_RefinedPetroleumProductsAndNuclearFuel	This class includes the areas used for the manufacturing coke, refined petroleum and processing of nuclear fuel.	2_1_RawIndustry
2_1_5_ManufacturingOfChemicalsChemicalProductsMan-MadeFibers	This class includes the areas used for the manufacturing of basic chemicals, agro-chemicals, paints, pharmaceuticals, soap, detergents, glues, other chemical products and man-made fibers	2_1_RawIndustry
2_1_6_ManufacturingOfBasicMetalsAndFabricatedMetals	This class includes the areas used for the manufacturing, processing and casting of iron, steel and basic precious and non-ferrous metals. It also includes the manufacturing of metal products.	2_1_RawIndustry
2_1_7_ManufacturingOfNonMetallicMineralProducts	This class includes the areas used for manufacturing glass, bricks, ceramics, concrete, cement, lime, plaster, stone etc.	2_1_RawIndustry
2_1_8_ManufacturingOfRubberPlasticProducts	This class includes the areas used for the manufacturing of tyres, tubes, plastic packing goods and other rubber and plastic products. the areas used for the manufacturing of glass and glass products, ceramics, bricks, tiles, cement, lime, plaster, articles of concrete and other non-metallic mineral products and cutting and shaping of stone.	2_1_RawIndustry
2_1_9_ManufacturingOfOtherRawMaterials	This class includes the production of raw materials not included in the classes defined above.	2_1_RawIndustry

INSPIRE	Reference: D2.8.III.4_v2.9		
TWG-LU	Data Specification on <i>Land Use</i>	2012-02-23	Page 75

2_2_HeavyEnd-ProductIndustry		2_SecondaryProduction
2_2_1_ManufacturingOfMachinery	This class includes the areas used for the manufacturing of production, agricultural, forestry and other machinery (excluding aircrafts and vehicles). This class also includes manufacturing of weapons, ammunition and domestic appliances.	2_2_HeavyEnd-ProductIndustry
2_2_2_ManufacturingOfVehiclesAndTransportEquipment	This class includes the areas used for the manufacturing of motor vehicles, aircrafts, spacecrafts, ships, boats, railway and tramway equipment, motorcycles, bicycles and other transport equipment.	2_2_HeavyEnd-ProductIndustry
2_2_3_ManufacturingOfOtherHeavyEndProducts	This class includes the production of other heavy end products not included in the classes defined above.	2_2_HeavyEnd-ProductIndustry
2_3_LightEnd-ProductIndustry	This class includes the activities transforming raw manufactured products into light manufactured products	2_SecondaryProduction
2_3_1_ManufacturingOfFoodBeveragesAndTobaccoProducts	This class includes areas used for the manufacturing of meat, fish, fruit and vegetables, oils and fats or derived products, dairy products, grain mill and starch products, prepared animal feeds, other food products, beverages and tobacco products.	2_3_LightEnd-ProductIndustry
2_3_2_ManufacturingOfClothesAndLeather	This class includes areas used for the manufacturing of wearing apparel, leather clothes, dressing, accessories, dyeing of fur and manufacturing of fur products as well as manufacture of luggage, bags, saddlery and footwear.	2_3_LightEnd-ProductIndustry
2_3_3_PublishingAndPrinting	This class includes the areas used for publishing and printing of books, newspapers, journals and the publishing and reproduction of sound recordings.	2_3_LightEnd-ProductIndustry
2_3_4_ManufacturingOfElectricalAndOpticalEquipment	This class includes the areas used for the manufacturing of office machinery, computers, motors, generators, electricity distribution and control apparatus, wires and cables, accumulators, batteries, lamps, radios, TVs, phones, electronic valves and tubes, medical, precision and optical instruments, watches and other electrical and optical equipment.	2_3_LightEnd-ProductIndustry
2_3_5_ManufacturingOfOtherLightEndProducts	This class includes the manufacturing of furniture, jewellery, musical instruments, sports goods, games, toys and other miscellaneous products.	2_3_LightEnd-ProductIndustry
2_4_Energy_production		2_SecondaryProduction
2_4_1_NuclearBasedEnergyProduction	This class includes areas where nuclear power plants are operated	2_4_Energy_production
2_4_2_FossilFuelBasedEnergyProduction	This class includes areas where power plants using fossil fuels (coal, oil, natural gas, peat and other fossil fuels)	2_4_Energy_production
2_4_3_BiomassBasedEnergyProduction	This class includes combustion power plants using biomass based fuels (wood and other plant based solid and liquid fuels, biogas and other biofuels)	2_4_Energy_production
2_4_4_RenewableEnergyProduction	This class includes hydro-, solar, wind, thermal (aero, geo and hydro), tidal, wave etc. energy and other renewable energy (except biomass energy belonging to class 2.4.3)	2_4_Energy_production
2_5_OtherIndustry	This class includes the production of other industrial products not included in the classes	2_SecondaryProduction

INSPIRE	Reference: D2.8.III.4_v2.9		
TWG-LU	Data Specification on <i>Land Use</i>	2012-02-23	Page 76

	defined above.	
3_TertiaryProduction	This class includes areas where services are products for other businesses and consumers. It includes both private and public services. It encompasses whole sale and retail trade, repair services, hotels and restaurants, financial services, real estate, business services, rental services, public administration, defence and social security, education, health and social work and other community, social and personal services.	
3_1_CommercialServices		3_TertiaryProduction
3_1_1_WholesaleAndRetailTradeAndRepairOfVehiclesAndPersonalAndHouseholdGoods	This class includes the areas used for the wholesale and retail sale of motor vehicles, fuel, agricultural raw materials, live animals, ores, metals, chemicals, timber , machinery, ships, furniture, household goods, textiles, food, beverages, tobacco products, pharmaceutical products, second hand goods, other products, waste and scrap. This class includes also the repair of vehicles, personal and household goods.	3_1_CommercialServices
3_1_2_RealEstateServices	This class includes the areas used for the provision of real estate and renting, services.	3_1_CommercialServices
3_1_3_AccommodationAndFoodServices	This class includes the areas used for provision of hotel, holiday village, camping site, restaurant, bar and canteen services.	3_1_CommercialServices
3_1_4_OtherCommercialServices	This class includes the areas used for other commercial services not included in the classes defined above or below such as beauty and wellbeing services..	3_1_CommercialServices
3_2_FinancialProfessionalAndInformationServices		3_TertiaryProduction
3_2_1_FinancialAndInsuranceServices	This class includes the areas used for the provision of banking, credit, insurance, and other financial services.	3_2_FinancialProfessionalAndInformationServices
3_2_2_ProfessionalTechnicalAndScientificServices	This class includes the areas used for the provision of IT consulting, data processing, research and development, legal, accountancy, business management, architectural, engineering, advertising, testing, investigation, consulting, research, development and other professional services	3_2_FinancialProfessionalAndInformationServices
3_2_3_InformationAndCommunicationServices	This class includes the areas used for the provision of publishing, sound recording, TV-programme, motion picture, radio broadcasting, post and telecommunication, computer and data processing services.	3_2_FinancialProfessionalAndInformationServices
3_2_4_AdministrativeAndSupportServices	This class includes the areas used for the provision of travel agency, rental, cleaning, security and other administrative and support services.	3_2_FinancialProfessionalAndInformationServices
3_2_5_OtherFinancialProfessionalAndInformationServices	This class includes the areas used for other financial, professional and information services not included in the classes defined above.	3_2_FinancialProfessionalAndInformationServices
3_3_CommunityServices		3_TertiaryProduction
3_3_1_PublicAdministrationDefenceAndSocialSecurityServices	This class includes the areas used for the provision of generic administrative, defence, justice, public security, fire and compulsory	3_3_CommunityServices

INSPIRE	Reference: D2.8.III.4_v2.9		
TWG-LU	Data Specification on <i>Land Use</i>	2012-02-23	Page 77

	social security services.	
3_3_2_EducationalServices	This class includes the areas used for the provision of primary, secondary, higher, adult and other educational services.	3_3_CommunityServices
3_3_3_HealthAndSocialServices	This class includes the areas used for the provision of human and animal health and social work services.	3_3_CommunityServices
3_3_4_ReligiousServices	This class includes the areas used for the provision of religious services.	3_3_CommunityServices
3_3_5_OtherCommunityServices	This class includes areas used for other community services (e.g. cemeteries).	3_3_CommunityServices
3_4_CulturalEntertainmentAndRecreationalServices		3_TertiaryProduction
3_4_1_CulturalServices	This class includes the provision of artistic, library, museum, zoos, botanical gardens, historical sites and other cultural services.	3_4_CulturalEntertainmentAndRecreationalServices
3_4_2_EntertainmentServices	This class includes the provision of amusement parks, , theme parks, betting and gambling activities and other entertainment services.	3_4_CulturalEntertainmentAndRecreationalServices
3_4_3_SportsInfrastructure	This class includes the areas used for the provision of sports infrastructure, such as stadiums, sports halls, swimming pools, fitness facilities, ski resorts, golf courses and other sports infrastructure.	3_4_CulturalEntertainmentAndRecreationalServices
3_4_4_OpenAirRecreationalAreas	This class includes open air recreational areas e.g. urban parks, playgrounds, national parks, and natural areas used for recreational purposes (e.g. forests, heathland, moors, mountains, agricultural areas, ponds, lakes, rivers).	3_4_CulturalEntertainmentAndRecreationalServices
3_4_5_OtherRecreationalServices	This class includes other recreational services e.g. not included in the classes above.	3_4_CulturalEntertainmentAndRecreationalServices
3_5_OtherServices	This class includes the areas used for the provision of other services not included in parts 3.1-3.4 of HILUCS.	3_TertiaryProduction
4_TransportNetworksLogisticsAndUtilities	This class includes the basic infrastructure and networks of the society. All the other sectors are using the infrastructure and networks to produce the goods and services. It includes land used for water supply, collection, treatment and recycling of sewage and waste, transport, networks, storage and communication. This infrastructure is vital also for residential areas.	
4_1_TransportNetworks		4_TransportNetworksLogisticsAndUtilities
4_1_1_RoadTransport	This class includes the areas used for road transport e.g. roads, parking areas, service stations	4_1_TransportNetworks
4_1_2_RailwayTransport	This class includes the areas used for rail transport e.g. rails, railway stations and yards etc.	4_1_TransportNetworks
4_1_3_AirTransport	This class includes the areas used for air transport e.g. airports and related services.	4_1_TransportNetworks
4_1_4_WaterTransport	This class includes the areas used for water transport e.g. ports, rivers, docks and related services.	4_1_TransportNetworks

INSPIRE	Reference: D2.8.III.4_v2.9		
TWG-LU	Data Specification on <i>Land Use</i>	2012-02-23	Page 78

4_1_5_OtherTransportNetwork	This class includes the areas used for other transport not included in classes 4.1.1 – 4.1.4.	4_1_TransportNetworks
4_2_LogisticalAndStorageServices	This class includes areas used for separate (not linked directly to industries) storage services and logistical services.	4_TransportNetworksLogisticsAndUtilities
4_3_Utilities		4_TransportNetworksLogisticsAndUtilities
4_3_1_ElectricityGasAndThermalPowerDistributionServices	This class includes the areas used distribution of electricity, gas and thermal energy. This class includes the pipelines used for transporting oil and gas.	4_3_Utilities
4_3_2_WaterAndSewageInfrastructure	This class includes the areas used for the extraction, collection, purification storage and distribution of water and collection and treatment of sewage (including the pipelines).	4_3_Utilities
4_3_3_WasteTreatment	This class includes the areas used for the collection, treatment and recycling of waste (dumpsites, waste incineration, composting, hazardous waste treatment and recycling facilities).	4_3_Utilities
4_3_4_OtherUtilities	This class includes areas used for other utilities not included in the classes 4.3.1 – 4.3.3.	4_3_Utilities
5_ResidentialUse	This class includes areas used dominantly for housing of people. The forms of housing vary significantly between, and through, residential areas. These areas include single family housing, multi-family residential, or mobile homes in cities, towns and rural districts if they are not linked to primary production. It permits high density land use and low density uses. This class also includes residential areas mixed with other non-conflicting uses and other residential areas (e.g. temporarily used areas).	
5_1_PermanentResidentialUse	This area includes residential areas dominated by detached houses surrounded by gardens and/or yards, a mix of single houses, semi-detached houses, terraced houses, town houses, row houses and blocks of flats used as permanent residence.	5_ResidentialUse
5_2_ResidentialUseWithOtherCompatibleUses	This class includes residential areas mixed with other non-conflicting uses (e.g. various services, light industries etc.).	5_ResidentialUse
5_3_OtherResidentialUse	This class includes areas dominated e.g by areas used for temporary dwellings (camps of migrant people), holiday residences (summer cottages), etc.	5_ResidentialUse
6_OtherUses	This class includes areas not covered by the above mentioned classes or under construction.	
6_1_TransitionalAreas	This class includes areas under construction. This class should be used only for existing land use and not for planned land use.	6_OtherUses
6_2_AbandonedAreas	This class includes abandoned agricultural, residential and industrial, transport and basic infrastructure areas. Area belongs to the abandoned class if it is not in use and can't any more be used for the original purpose without major reparation/renovation work.	6_OtherUses
6_3_NaturalAreasNotInOtherEconomicUse		6_OtherUses

6_3_1_LandAreasNotInOtherEconomicUse	This class includes areas which are in natural state and not in other use e.g. woodland, shrubland, grassland, wetland, bare land, which are not in any socio-economic use. This includes the areas with a planning status 'natural area'. Protected areas can belong to this class or if other uses are present also to other classes. Protected areas are always tagged with a supplementary regulation status 'protected area'.	6_3_NaturalAreasNotInOtherEconomicUse
6_3_2_WaterAreasNotInOtherEconomicUse	This class includes water areas which are not in any socio-economic use (e.g. lakes, rivers, and permanent snow or ice covered areas)	6_3_NaturalAreasNotInOtherEconomicUse
6_4_AreasWhereAnyUseAllowed	This class includes areas where any use is allowed in the Planned land use (PLU)	6_OtherUses
6_5_AreasWithoutAnySpecifiedPlannedUse	This class includes areas where no use is specified in the Planned land use (PLU), e.g. areas outside the scope of the plan.	6_OtherUses

5.2.7.2. Values of code list **SupplementaryRegulationValue**

Value	Definition	Description	Parent value
1_ImpactOnEnvironment	supplementary regulation related to the impact on the environment as defined by a competent authority and reported in the spatial plan		
1_1_NoiseManagementZone	An area where measures have been established to mitigate noise pollution.	NOTE: Noise Management Areas or Zones may encompass areas surrounding airports, roads or entertainment venues. (from AM DS V2.0)	1_ImpactOnEnvironment
1_1_1_NoiseProtectionArea	area inside which specific measure regarding the protection against noise are enacted		1_1_NoiseManagementZone
1_2_EmissionControlArea	An area where measures have been established to control air pollution.		1_ImpactOnEnvironment
1_2_1_AirQualityManagementZone	Part of the territory of a Member State, as delimited by that Member State for the purposes of air quality assessment and management.	SOURCE: CAFE Directive (2008/50/EC).	
1_3_RenewableEnergyArea	area suitable for renewable energy		1_ImpactOnEnvironment
1_4_NatureProtection	area which relates to the protection of nature		1_ImpactOnEnvironment
1_4_1_EcologicalCorridor	area of habitat connecting wildlife populations separated by human activities (such as roads, development, or logging)		1_4_NatureProtection
1_4_2_BiodiversityReservoir	geographic area with a significant reservoir of biodiversity that is under threat from humans		1_4_NatureProtection
1_4_3_ProtectedWoodedArea	wooded area that is protected		1_4_NatureProtection

INSPIRE	Reference: D2.8.III.4_v2.9		
TWG-LU	Data Specification on <i>Land Use</i>	2012-02-23	Page 80

1_4_4_ProtectedUrbanPeriurbanAgriculturalOrNaturalArea	Agricultural or Natural Area in Urban or peri-urban space which is protected		1_4_NatureProtection
1_4_5_ProtectedWetland	area where the main factor of influence on habitat and its biota is waterland which is protected		1_4_NatureProtection
1_4_6_PlantHealthProtectionZone	Protection zone within which protective measures are established against the introduction of organisms harmful to plants or plant products and against their spread.	SOURCE: COMMISSION REGULATION (EC) No 690/2008.	1_4_NatureProtection
1_4_7_OtherNatureProtectionArea	area which relates to the protection of nature of other type		1_4_NatureProtection
1_5_ClimateProtection	An area where measures have been established to mitigate climate change effects.		1_ImpactOnEnvironment
1_6_WaterProtection	An area where measures have been established to protect water		1_1_NoiseManagementZone
1_6_1_DesignatedWaters	Marine, coastal or surface waters designated by Member States as needing protection or improvement in order to support fish life.	NOTE: Member States are required to define designated waters to protect freshwater fish and shellfish by the Fisheries Directive (2006/44/EC) and Shellfish Waters Directive (2006/113/EEC). (from AM DS V2.0)	1_6_WaterProtection
1_6_2_NitrateVulnerableZone	Areas of land which drain into polluted or threatened waters and which contribute to nitrate pollution.	SOURCE: Art 3 of Council Directive 91/676/EEC of 12 December 1991 concerning the protection of waters against pollution caused by nitrates from agricultural sources.	1_6_WaterProtection
1_6_3_SensitiveArea	Sensitive areas are surface waters (freshwater, estuaries and coastal waters) that require protection against eutrophication.	SOURCE: Urban Waste Water Treatment Directive (91/271/EEC).	1_6_WaterProtection
1_6_4_BathingWaters	Coastal waters or inland waters (rivers, lakes) explicitly authorised, or not prohibited for recreational bathing by large numbers of people.	NOTE: Bathing waters are set limits for physical, chemical and microbiological parameters to ensuring clean bathing waters to protect public health and the environment. (from AM DS V2.0)	1_6_3_SensitiveArea
1_6_5_DrinkingWaterProtectionArea	Area in which waste water leakage, use of fertilizer or pesticides, or establishment of waste disposal sites are prohibited.	EXAMPLE: From Directive 80/778, relating to the quality of water intended for human consumption. According to the article 8 providing that Member States shall take all the necessary measures to ensure that any substances used in the preparation of water for human consumption do not remain in concentrations higher than the maximum admissible. (from AM DS V2.0)	1_6_4_BathingWaters
1_7_OtherImpactOnEnvironment	supplementary regulation of other type related to the impact on the environment as defined by a competent authority and reported in the spatial plan		1_ImpactOnEnvironment

INSPIRE	Reference: D2.8.III.4_v2.9		
TWG-LU	Data Specification on <i>Land Use</i>	2012-02-23	Page 81

2_RiskExposure	supplementary regulation related to the exposure to risk of any nature as defined by a competent authority and reported in the spatial plan	<p>NOTE1: Numerous natural events represent a risk for the living, built and natural environment as they threaten human and animal life and may cause serious damages to settlements. For that reason, human settlements have to be protected, as far as possible, against risks through adapted prevention measures. According to their intensity, impacts and damages, these natural events (or hazards) may be considered as natural disasters. A natural disaster is therefore the consequence of the combination of a natural hazard and human activities. Main natural hazards are: avalanches, drought, earthquakes, floods, land slides, volcanic eruptions, tsunamis, tornado, cyclones, wildfires, etc.</p> <p>NOTE 2: Technological risk / Technological hazard A technological risk is necessarily related to human activities in the fields of manufacturing and energy production, transport, buildings, public works, etc. Risks due to industrial, nuclear, mining and subterranean activities or risks due to the transport of hazardous substances (by land, river or sea) or the threat of a dam rupture are all considered major technological risks.</p> <p>SOURCE: CEMAT</p>	
2_1_FloodRisks	supplementary regulation related to the exposure to Flood		2_RiskExposure
2_1_1_AreaExposedToFloodRisk	area which is defined as exposed to flood risks		2_1_FloodRisks
2_1_2_FloodRiskManagement Zone	Coastal areas or individual river basins assigned as the unit of management established for the assessment and management of flood risk.	<p>NOTE: These are coastal areas or individual river basins assigned as a unit of management different from those assigned pursuant to Article 3(1) of Directive 2000/60/EC.</p> <p>SOURCE: 2007/60/EC Art 3(2)b.</p>	2_1_FloodRisks
2_2_IndustrialRisk	area at risk of dangerous material exposure		2_RiskExposure
2_2_1_Lead	area at risk of lead exposure		2_2_IndustrialRisk
2_2_2_RestrictedZonesAround ContaminatedSites	Zones established to protect human, plant and animal health and control movement and development within a contaminated site.	<p>EXAMPLE1: Chernobyl Nuclear Power Plant Exclusion Zone which was established to evacuate the local population and to prevent people from entering the heavily contaminated territory.</p> <p>EXAMPLE2: Zone established around an area suffering from soil contamination to restrict development and protect human health.</p> <p>(from AM DS V2.0)</p>	2_2_IndustrialRisk

INSPIRE	Reference: D2.8.III.4_v2.9		
TWG-LU	Data Specification on <i>Land Use</i>	2012-02-23	Page 82

2_2_3_Brownfield land	Brownfield land is land previously used for industrial purposes or certain commercial uses and that may be contaminated by low concentrations of hazardous waste or pollution and has the potential to be re-used once it is cleaned up ⁴ . Sometimes, the concept of brownfield land is also used for designating areas which were previously developed and have become obsolete, but are non necessarily contaminated.	SOURCE Spatial development glossary European Conference of Ministers responsible for Spatial/Regional Planning (CEMAT)	2_2_IndustrialRisk
2_2_4_ExclusionAreaAroundSevesoSites	area within a regulatory distance from a site classified as Seveso		2_2_IndustrialRisk
2_3_Mining	area which is defined as exposed to mining risks		2_RiskExposure
2_4_Erosion	area which is defined as exposed to erosion risks.		2_RiskExposure
2_5_OtherRiskExposure	area defined by other type of risk exposure.		2_RiskExposure
3_HeritageProtection	supplementary regulation related to any heritage protection be it natural, landscape or built up, as defined by a competent authority and reported in the spatial plan	NOTE: heritage is the legacy of physical artefacts that are inherited from past generations, maintained in the present and bestowed for the benefit of future generations. Heritage includes tangible culture (such as buildings, monuments, landscapes and natural heritage (including culturally-significant landscapes, and biodiversity). The deliberate act of keeping cultural heritage from the present for the future is known as Conservation (British English). Cultural heritage is often unique and irreplaceable, which places the responsibility of preservation on the current generation.	
3_1_NaturalHeritageProtection	surrounding of an area protected due to its natural heritage importance		3_HeritageProtection
3_1_1_BiodiversityProtection	including flora and fauna, scientifically known as biodiversity.		3_1_NaturalHeritageProtection
3_1_2_GeodiversityProtection	including mineralogical, geomorphological, palaeontological, etc., scientifically known as geodiversity.	NOTE: These kind of heritage sites often serve as an important component in a country's tourist industry, attracting many visitors from abroad as well as locally. Heritage can also include cultural landscapes (natural features that may have cultural attributes).	3_1_NaturalHeritageProtection
3_2_LandscapeAreaProtection	area in which the landscape is protected,	NOTE: According to the European Landscape convention, "landscape means an area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors" SOURCE: CEMAT	3_HeritageProtection

INSPIRE	Reference: D2.8.III.4_v2.9		
TWG-LU	Data Specification on <i>Land Use</i>	2012-02-23	Page 83

3_3_BuiltHeritageProtection	surrounding of any protected monument within which the building rights are restricted	NOTE Architectural conservation describes the process through which the material, historical, and design integrity of mankind's built heritage are prolonged through carefully planned interventions including in its surroundings	3_HeritageProtection
3_4_ArcheologicalProtection	surrounding of an archaeological site within which the building rights are restricted	NOTE: An archaeological site is a place (or group of physical sites) in which evidence of past activity is preserved (either prehistoric or historic or contemporary), and which has been, or may be, investigated using the discipline of archaeology and represents a part of the archaeological record.	3_HeritageProtection
3_5_OtherHeritageProtection	other supplementary regulation that relates to heritage protection.		3_HeritageProtection
4_GeneralInterest	supplementary regulation related to the general interest such as easements, as defined by a competent authority and reported in the spatial plan		
4_1_PublicEasement	An easement is a certain right to use the real property of another or to restrict the use of a real property without possessing it. The rights of an easement holder vary substantially among jurisdictions. A public easement grants an easement for a public use or for the general interest	SOURCE: WIKIPEDIA	4_GeneralInterest
4_1_1_AirportEasement	area around airports where constructibility is restricted for safety reason (clearance of obstacle for take-off and landing)		4_1_PublicEasement
4_1_2_RailroadEasement	right-of-way as a strip of land that is granted, through an easement, for the purposes of maintenance or expansion of existing services		4_1_PublicEasement
4_1_3_UtilityEasement	strip of land that is granted, through an easement, where constructibility is restricted for safety of maintenance reason		4_1_PublicEasement
4_1_3_1_RainWaterEasement.	An easement to carry rainwater to a river, wetland, detention pond, or other body of water.		4_1_3_UtilityEasement
4_1_3_2_SanitarySewerEasement.	An easement to carry used water to a sewage treatment plant.		4_1_3_UtilityEasement
4_1_3_3_ElectricalPowerLineEasement	An easement related to the high voltage electrical network		4_1_3_UtilityEasement
4_1_3_4_TelephoneLineEasement	An easement related to the telephone network		4_1_3_UtilityEasement
4_1_3_5_RadioElectricalEasement	An easement restructuring the constructibility around Radio-electrical devices in order to avoid radio masks or radio interference	NOTE: also called communications easement. This easement is used for wireless communications towers	4_1_3_UtilityEasement
4_1_3_6_FuelGasPipeEasement	an easement related to the security around gas-lines or pipelines		4_1_3_UtilityEasement

INSPIRE	Reference: D2.8.III.4_v2.9		
TWG-LU	Data Specification on <i>Land Use</i>	2012-02-23	Page 84

4_1_4_BeachAccess	Some jurisdictions permit residents to access a public lake or beach by crossing adjacent private property. Similarly, there may be a private easement to cross a private lake to reach a remote private property, or an easement to cross private property during high tide to reach remote beach property on foot.		4_1_PublicEasement
4_1_5_ConservationEasement	Grants rights to a land trust to limit development in order to protect the environment.		4_1_PublicEasement
4_1_6_Historic preservation easement	Similar to the conservation easement, typically grants rights to a historic preservation organization to enforce restrictions on alteration of a historic building's exterior or interior.		4_1_PublicEasement
4_1_7_OtherPublicEasement	Other supplementary regulation related to a public easement		4_1_PublicEasement
4_2_OtherEasement	other supplementary regulation that relates to easements.		
4_3_OtherReservedAreasServingGeneralInterest	supplementary regulation related to the general interest other than easements, as defined by a competent authority and reported in the spatial plan		4_GeneralInterest
5_LandPropertyRight	supplementary regulation related that affect the right of the owner regarding its land properties, as defined in the spatial plan		
5_1_UsableBuildingArea	permissible built area of a lot/plot	Encyclopedic Dictionary of Landscape and Urban Planning, Multilingual Reference Book in English, Spanish, French, and German	5_LandPropertyRight
5_2_AreaReservedForPreemptingParcels	Area defined in the spatial plan where the local government define a "Right of first refusal" (ROFR or RFR) that gives him the option to enter a business transaction with the owner of a property before the owner is entitled to enter into that transaction with a third party.		5_LandPropertyRight
5_3_AreaReservedForRestructuringParcels	Reorganization of land holdings or subdivisions in a plan area as designated on a legally-binding plan for the redistribution of developed or undeveloped [p]lots of land such that their shape and size comply with future land development or rezoning.	Encyclopedic Dictionary of Landscape and Urban Planning, Multilingual Reference Book in English, Spanish, French, and German	5_LandPropertyRight
5_4_ReconstructionAreas	Sectors where the issuance of building permits may be subject to the demolition of all or part of the existing buildings on the land where the implementation of the construction is planned		5_LandPropertyRight
5_6_StandByLandResources	Lands affected by the location of future infrastructures		5_LandPropertyRight
5_7_OtherLandPropertyRight	Other supplementary regulation that relates to a land property		5_LandPropertyRight

INSPIRE	Reference: D2.8.III.4_v2.9		
TWG-LU	Data Specification on <i>Land Use</i>	2012-02-23	Page 85

6_RegulationsOnBuildings	supplementary regulation related to restriction and guidance on buildings (e.g. area where height limitation are imposed near airports, area where density ratio over land parcel is limited), as defined by the competent authority responsible for the spatial plan and reported in the spatial plan		
6_1_BuildingLine	Any new buildings must be placed behind the line determined by the alignment plan. If the owner built or rebuilt a house or boundary wall, it must respect the alignment.		6_RegulationsOnBuildings
6_2_BoundaryLine	perimeter adjacent to infrastructure		6_RegulationsOnBuildings
6_3_SpatialDesign	Area where buildings have to conform to spatial design guidance		6_RegulationsOnBuildings
6_4_SecondaryStructuraArea	spaces for secondary structures which are required in accordance with other regulations on the use of land, such as play, leisure and recreational areas, and car-parking spaces, garages and drive-ways	Encyclopedic Dictionary of Landscape and Urban Planning, Multilingual Reference Book in English, Spanish, French, and German	6_RegulationsOnBuildings
6_5_CollectiveFacility			6_RegulationsOnBuildings
6_6_BuildingHightRegulation	Area where buildings have to conform to hight guidance		6_RegulationsOnBuildings
6_7_BuidingDensityRegulation	Area where buildings have to conform to density guidance		6_RegulationsOnBuildings
6_8_MinimumHousingSize	area with minimum size of housing		6_RegulationsOnBuildings
6_9_OtherRegulationsOnBuildings	other supplementary regulation that relates to buildings		6_RegulationsOnBuildings
7_LocalRegionalStateDevelopmentPolicies	supplementary regulation related to local/regional/state spatial development policies (e.g. area reserved for the construction of road infrastructures development axes, central places / population growth center, suitable area for development,...) as defined by a competent authority and reported in the spatial plan		
7_1_SettlementStructure	Settlement structure is the quantitative and qualitative pattern of distribution of housing, places of work, and infrastructure within a certain area.	SOURCE: INTERREG III B project COMMIN, http://commin.org/en/commin/	7_LocalRegionalStateDevelopmentPolicies

INSPIRE	Reference: D2.8.III.4_v2.9		
TWG-LU	Data Specification on <i>Land Use</i>	2012-02-23	Page 86

7_1_1_CentralPlaces	The central-place classificatory system is an important tool in state and regional planning, and is laid down in spatial structure plans. In addition to supplying the needs of its own population, a central place performs service and development functions for the population of its catchment area. The central place system constitutes a hierarchy of basic, lower-order or small centres, middle-order centres, and high-order centres as determined at the different levels of state spatial planning. Some states insert intermediate categories in the hierarchy. Depending on their assignment to a central place, catchment areas are defined as local, intermediate or extended areas.	SOURCE: INTERREG III B project COMMIN, http://commin.org/en/commin/	7_1_SettlementStructure
7_1_1_1_Basic	basic centres supplying the basic daily needs of the population and providing a minimum of public and private infrastructure		7_1_1_CentralPlaces
7_1_1_2_LowerOrderCentre	The lowest level in the hierarchy is occupied by basic centres (low-order centres, small centres) with a local catchment area. They are designated in regional plans, and their functions include supplying the basic daily needs of the population and providing a minimum of public and private infrastructure (general secondary school, doctor, chemist, tradesmen, etc.).	SOURCE: INTERREG III B project COMMIN, http://commin.org/en/commin/	7_1_1_CentralPlaces
7_1_1_3_MiddleOrderCentre	Middle-order centres are central places that meet more demanding, medium-term needs of the population in the intermediate catchment area (secondary schools leading to university entrance, hospitals, a variety of shopping amenities, etc.), and are designated by state spatial planning. They are also labour-market centres for their catchment area.	SOURCE: INTERREG III B project COMMIN, http://commin.org/en/commin/	7_1_1_CentralPlaces
7_1_1_4_HighOrderCentre	High-order centres are also designated by state spatial planning and meet demanding, specialised requirements of the population in the extended catchment area (technical colleges / universities, specialised clinics, large department stores, etc.). High-order centres also have a greater supply of highly qualified and skilled labour.	SOURCE: INTERREG III B project COMMIN, http://commin.org/en/commin/	7_1_1_CentralPlaces
7_1_2_Axes	Important elements in spatial planning, axes are constituted by a concentration of transport and supply routes (linear infrastructure) and a relatively close succession of development centres and central places.	SOURCE: INTERREG III B project COMMIN, http://commin.org/en/commin/	7_1_SettlementStructure

INSPIRE	Reference: D2.8.III.4_v2.9		
TWG-LU	Data Specification on <i>Land Use</i>	2012-02-23	Page 87

7_1_2_1_SettlementAxes	Settlement axes are axes in agglomerations formed by a close succession of settlements along the routes of existing or planned public transport services.	SOURCE: INTERREG III B project COMMIN, http://commin.org/en/commin/	7_1_2_Axes
7_1_2_2_SupralocalAxes	Supralocal axes connect differently ranking central places and offer locational advantages at transport interchanges or nodes. Supralocal axes are national or European communication axes.	SOURCE: INTERREG III B project COMMIN, http://commin.org/en/commin/	7_1_2_Axes
7_1_3_AssignmentOfFunctions	Tasks assigned specifically to individual municipalities or regions by state spatial planning are referred to as functions. The aim is the functional/structural (or spatial/functional) division of responsibilities and labour among component territorial entities.	SOURCE: INTERREG III B project COMMIN, http://commin.org/en/commin/	7_1_SettlementStructure
7_1_3_1_Housing	Housing is an adequate complex of premises, an isolated room, a shelter, an apartment or a private house for permanent living	SOURCE: INTERREG III B project COMMIN, http://commin.org/en/commin/	7_1_3_AssignmentOfFunctions
7_1_3_2_CommerceIndustry	commerce and industry key functions associated with municipalities or regions on regional or state level planning service key functions associated with municipalities or regions on regional or state level planning tourism key functions associated with municipalities or regions on regional or state level planning agriculture key functions associated with municipalities or regions on regional or state level planning forestry functions key associated with municipalities or regions on regional or state level planning		7_1_3_AssignmentOfFunctions
7_1_3_3_Services			7_1_3_AssignmentOfFunctions
7_1_3_4_Tourism			7_1_3_AssignmentOfFunctions
7_1_3_5_Agriculture			7_1_3_AssignmentOfFunctions
7_1_3_6_Forestry			7_1_3_AssignmentOfFunctions
7_1_3_7_Business park	area of land in which many office and commercial buildings are grouped together ⁵ . Business parks are groupings of tertiary activities and differ from industrial parks (manufacturing activities) or technology parks (research and technological development activities).	SOURCE: CEMAT	7_1_3_AssignmentOfFunctions
7_1_3_8_Technopole	(also called technology centre, technology park or science park) areas where numerous private and public activities pertaining to research and development, technological development, technology transfer, high-level scientific education, high-tech manufacturing activities and services, etc. are concentrated. In numerous cases, technopoles encompass one or several specialised cluster(s) of high-tech enterprises, incubators for startups, a	SOURCE: CEMAT	7_1_3_AssignmentOfFunctions

INSPIRE	Reference: D2.8.III.4_v2.9		
TWG-LU	Data Specification on <i>Land Use</i>	2012-02-23	Page 88

	business and innovation centre, consultancy clusters.		
7_1_3_9_HarborActivities	harbor key functions associated with municipalities or regions on regional or state level planning		7_1_3_AssignmentOfFunctions
7_1_3_10_AirportActivities	airport key functions associated with municipalities or regions on regional or state level planning		7_1_3_AssignmentOfFunctions
7_1_4_SpatialOrderCategories	Spatial order categories are areas defined in terms of specific criteria in which comparable structures exist and where similar spatial planning goals are pursued.	SOURCE: INTERREG III B project COMMUN, http://commun.org/en/commun/	7_1_SettlementStructure
7_1_4_1_RuralArea	sparsely settled areas without significant large city or town. The countryside refers to certain forms of landscapes and land uses where agriculture and natural areas play an important part.	SOURCE: CEMAT	7_1_4_SpatialOrderCategories
7_1_4_2_RuralDevelopmentPole	an inhabited, significantly rural area where the social, economic and territorial evolutions are led within the framework of an integrated and prospective development plan. A rural pole is not an agglomeration, but a rural territory as a whole, which may include one or more small towns. The territorial development plan determines the objectives of results in short, medium and long terms. It specifies the guidelines for development, the human and material means to achieve the results targeted. The civil society, public and private actors must be partner for its development and its assessment	SOURCE: CEMAT	7_1_4_SpatialOrderCategories
7_1_4_3_CityAndOuterConurbationArea	aggregation or continuous network of urban communities which have physically merged through population growth and expansion. It is a polycentric form of agglomeration	SOURCE: CEMAT	7_1_4_SpatialOrderCategories
7_1_4_4_UrbanArea	area which physically forms part of a town or city and is characterised by an important share of built-up surfaces, high density of population and employment and significant amounts of transport and other infrastructure (as opposed to rural areas). Urban areas may also comprise non built-up, green areas generally used for recreational purposes by urban dwellers.	SOURCE: CEMAT	7_1_4_SpatialOrderCategories

INSPIRE	Reference: D2.8.III.4_v2.9		
TWG-LU	Data Specification on <i>Land Use</i>	2012-02-23	Page 89

7_1_4_5_MetropolitanArea	a settlement system consisting of a large city (together with its suburbs) and its adjacent zones of influence, which may comprise various urban centres of different sizes. These adjacent zones are generally the so-called commuter belt. Interstitial open spaces also form part of the metropolitan area.	SOURCE: CEMAT	7_1_4_SpatialOrderCategories
7_1_4_6_FunctionalUrbanArea	area of influence of a city. It is generally delineated on the basis of statistics (for instance commuter flows). Most European States have definitions of Functional Urban Areas or similar concepts, such as travel to-work-areas, commuting catchment areas, commuting zones or functional urban regions. In the context of the ESPON I Programme, an attempt has been made to produce an identification and delineation of functional urban areas (FUA) at European level, using a harmonised statistical definition.	SOURCE: CEMAT	7_1_4_SpatialOrderCategories
7_1_4_7_PeriUrbanAreas	areas that are in some form of transition from strictly rural to urban. These areas often form the immediate urban-rural interface and may eventually evolve into being fully urban. Peri-urban areas are places where people are key components: they are lived-in environments.	SOURCE: CEMAT	7_1_4_SpatialOrderCategories
7_1_4_8_Polycentric spatial structure	A polycentric spatial structure refers to the morphology of the settlement system. It assumes that a plurality of urban agglomerations of similar size exist at the various levels of the urban hierarchy, as opposed to situations where a single large urban centre dominates each level and even eliminates the presence of intermediary levels. The principle of polycentric spatial structure can be applied at the various geographical scales, from the European to the regional one.		7_1_4_SpatialOrderCategories
7_1_4_9_Eurocorridor (or Pan-European corridor)	category of space of linear nature connecting large agglomerations over various national borders. They are areas of rapid and large-scale spatial dynamics within a Europe of vanishing national borders. Four interrelated dimensions can be distinguished in Eurocorridors: infrastructure and transport (mainly the Trans-European Networks), urbanisation, economic development and environmental sustainability.	SOURCE: CEMAT	7_1_4_SpatialOrderCategories

INSPIRE	Reference: D2.8.III.4_v2.9		
TWG-LU	Data Specification on <i>Land Use</i>	2012-02-23	Page 90

7_1_5_SpatialDevelopmentProjects	Area for projects generated or controlled by public bodies which contribute positively to territorial development at different scales. Spatial development projects may comprise infrastructure works, the economic promotion and development of specific areas, urban rehabilitation measures, the restoration of damaged ecosystems, etc.	SOURCE: CEMAT	7_1_SettlementStructure
7_1_6_OtherSettlementStructureDevelopmentPolicies	other supplementary regulation that relates to settlement structure development policies		7_1_SettlementStructure
7_2_OpenSpaceStructure	The term open-space structure refers to the quantitative and qualitative pattern or distribution of land uses and functions in a near-natural state.	SOURCE: INTERREG III B project COMMUN, http://commin.org/en/commin/	7_LocalRegionalStateDevelopmentPolicies
7_2_1_Agriculture	open space assigned to agriculture		7_2_OpenSpaceStructure
7_2_2_Forest	open space assigned to forest		7_2_OpenSpaceStructure
7_2_3_Recreation	leisure, recreation and other outdoor activities		7_2_OpenSpaceStructure
7_2_4_Tourism	open space assigned to tourism		7_2_OpenSpaceStructure
7_2_5_GreenBelt	land use designation to retain areas of largely undeveloped, wild, or agricultural land surrounding or neighbouring urban areas. Similar concepts are greenways or green wedges which have a linear character and may run through an urban area instead of around it. In essence, a green belt is an invisible line encircling a certain area, preventing development of the area allowing wildlife to return and be established.		7_2_OpenSpaceStructure
7_2_6_GreenBreak	Green breaks or divides are smaller protected open spaces areas close to settlements to be kept free of development for local recreational purposes and in order to break up densely built-up areas. Green breaks should link up with the open countryside and act as a climatic corridor and habitat, as both refuge and exchange area for plants and animals.	SOURCE: INTERREG III B project COMMUN, http://commin.org/en/commin/	7_2_OpenSpaceStructure
7_2_7_RawMaterials	open space assigned to prospection or dumping of material		7_2_OpenSpaceStructure

INSPIRE	Reference: D2.8.III.4_v2.9		
TWG-LU	Data Specification on <i>Land Use</i>	2012-02-23	Page 91

7_2_7_1_ProspectingAndMiningPermitArea	The area on which the prospection or extraction of any mineral has been authorised and for which that right or permit is granted.	EXAMPLE: Directive 94/22/EC on conditions for granting and using authorisations for the prospection, exploration and production of hydrocarbons, stipulates that the limits of the geographical areas covered by an authorisation and the duration of that authorisation must be determined in proportion to what is justified in terms of the best possible exercise of the activities from an economic and technical point of view. (from AM DS V2.0)	7_2_7_RawMaterials
7_2_7_2_AreaForDumpingOfWaste	Area affected by uncontrolled disposal of waste as defined in Waste Framework Directive (2006/12/EC) Art 4.(from AM DS V2.0)	(from AM DS V2.0)	7_2_7_RawMaterials
7_2_8_Recultivation	open space assigned to recultivation		7_2_OpenSpaceStructure
7_2_9_Water	water in open space		7_2_OpenSpaceStructure
7_2_10_OtherOpenSpaceStructures	Other supplementary regulation that relates to open space structures		7_2_OpenSpaceStructure
7_2_9_1_CoastalZoneManagementArea	Area in which "integrated coastal zone management" takes place.	DEFINITION: "Integrated coastal zone management" is a dynamic process for the sustainable management and use of coastal zones, taking into account at the same time the fragility of coastal ecosystems and landscapes, the diversity of activities and uses, their interactions, the maritime orientation of certain activities and uses and their impact on both the marine and land parts. SOURCE: Protocol on Integrated Coastal Zone Management in the Mediterranean - signed in Madrid on 20-21 January 2008. (from AM DS V2.0)	7_2_9_Water
7_3_Infrastructure	technical structures that support a society, such as roads, water supply, sewers, electrical grids, telecommunications, and so forth, and can be defined as "the physical components of interrelated systems providing commodities and services essential to enable, sustain, or enhance societal living conditions.		7_LocalRegionalStateDevelopmentPolicies
7_3_1_Network	the infrastructure and installations for transfer of goods		7_3_Infrastructure
7_3_1_1_Road	by road		7_3_1_Network
7_3_1_2_RailRoad	by rail		7_3_1_Network
7_3_1_3_WaterInfrastructure	by navigable water		7_3_1_Network

INSPIRE	Reference: D2.8.III.4_v2.9		
TWG-LU	Data Specification on <i>Land Use</i>	2012-02-23	Page 92

7_3_1_4_OtherNetworkInfrastructure	by other means such as powerlines, pipelines...		7_3_1_Network
7_3_1_5_RegulatedFairwayAtSeaOrLargeInlandWater	Regulated navigation areas port-to-port established in accordance with Decision 884/2004/EC of the European Parliament and Council of 29 April 2004 amending Decision No 1692/96/EC on Community guidelines for the development of the trans-European transport network to organise sailing traffic, prevent accident and pollution.	(from AM DS V2.0)	7_3_1_Network
7_3_2_Supply	Entire range of installations which serve to provide the population of an area with goods and services.	Encyclopedic Dictionary of Landscape and Urban Planning, Multilingual Reference Book in English, Spanish, French, and German	7_3_Infrastructure
7_3_3_Disposal	Discarding of all nonusable solid waste from the economic cycle, reprocessing of reusable material or interim storage and hauling to a disposal site for public health and convenience.	Encyclopedic Dictionary of Landscape and Urban Planning, Multilingual Reference Book in English, Spanish, French, and German	7_3_Infrastructure
7_3_4_Communication	communication (voice image etc.) infrastructure		7_3_Infrastructure
7_3_5_OtherInfrastructure	Other supplementary regulation to infrastructure		7_3_Infrastructure
7_4_UrbanReshapingAndDevelopmentArea	Cities are confronted to both the ageing of their fabric and built-up areas and to changes in their economic functions and in the social characteristics of their population. In order to maintain a harmonious living environment, a buoyant economy and a balanced social structure, a number of public (and sometimes public-private) activities are necessary.	SOURCE: CEMAT	7_LocalRegionalStateDevelopmentPolicies
7_4_1_UrbanRenewal	area where impoverished urban neighbourhoods and derelict areas are replaced by large-scale projects related to housing, services, transport systems, recreation areas, etc. Sometimes, the costs of urban renewal for living communities is high and this type of activity is nowadays less frequently carried out than some decades ago	SOURCE: CEMAT	7_4_UrbanReshapingAndDevelopmentArea
7_4_2_UrbanRegenerationAndRevitalisation	Area defined for transforming the obsolete socio-economic base of certain urban areas into a more sustainable socio-economic base through the attraction of new activities and companies, modernisation of the urban fabric, improvement of the urban environment and diversification of the social structure;	SOURCE: CEMAT	7_4_UrbanReshapingAndDevelopmentArea

INSPIRE	Reference: D2.8.III.4_v2.9		
TWG-LU	Data Specification on <i>Land Use</i>	2012-02-23	Page 93

7_4_3_UrbanRehabilitationAnd Restoration	area devoted to regenerating and conserving the built heritage or the urban environment, including the ecosystems. In addition to the refurbishment of historical buildings and townscapes, such activities also comprise the modernisation and upgrading of technical facilities and the respect of environmental and security norms and standards.	SOURCE: CEMAT	7_4_UrbanReshapingAndDevelopmentArea
7_4_4_CommercialDevelopmentArea	Area where a commercial development plan applies		7_4_UrbanReshapingAndDevelopmentArea
7_4_5_AfterZoning	after the ending of the current zoning the zoning will be forest/nature/housing...		7_4_UrbanReshapingAndDevelopmentArea
7_5_SpecificArea	areas for specific development policies		7_LocalRegionalStateDevelopmentPolicies
7_5_1_DerelictArea	areas which have suffered a significant downturn, with declining or abandoned industries, closed businesses and houses, vacant storefronts, a degraded environment and virtually empty streets at night. Some derelict areas are also contaminated and can be considered as brownfields sites. Derelict areas are a major cause of environmental stress in urban areas	SOURCE: CEMAT	7_5_SpecificArea
7_5_2_ParkingObligationArea	areas within which the conditions of service by regular public transport can reduce or eliminate the obligations imposed in the realization of parking, especially during the construction of office buildings, or within which the local plan sets a maximum number of parking spaces to achieve during the construction of buildings for other than residential		7_5_SpecificArea
7_5_3_DemolitionProvisionsAreas	Areas which provisions relating to the demolition permit exist within		7_5_SpecificArea
7_5_4_EnergySavingArea	priority perimeter for the development energy saving		7_5_SpecificArea
7_5_5_RulingDefering	areas within which the competent authority may defer ruling on applications for authorization		7_5_SpecificArea
7_6_StudyPlanRequest	areas where specific studies must be performed		7_LocalRegionalStateDevelopmentPolicies
8_SocialHealthChoices	supplementary regulation related to social choices and health protection decided by the responsible authority of the plan(e.g. area reserved with social housing ratios) as defined by the competent authority responsible for the spatial plan		

8_1_CompositionOfLocalResidentialPopulation	Preservation of physical structures and of the specific urban character of an area in order to maintain the composition of the local residential population. Might be adopted to counteract the threat of displacement in an inner-city residential area owing to gentrification.	SOURCE: INTERREG III B project COMMUN, http://commin.org/en/commin/	8_SocialHealthChoices
8_2_PubliclySubsidisedHousingArea	Housing area reserved for dwellings which are subsidized by state or local government for persons and families with low incomes	Encyclopedic Dictionary of Landscape and Urban Planning, Multilingual Reference Book in English, Spanish, French, and German	8_SocialHealthChoices
9_RegulatedActivities	supplementary regulation related to restricting, permitting or forbidding activities (e.g. area reserved or forbidding commercial activities) or where activities are suitable as defined by the competent authority responsible for the spatial plan		
9_1_RestrictedActivities	area in which specific activities have restrictions. The NACE code should be used to list the restricted activities		9_RegulatedActivities
9_2_PermittedActivities	area in which specific activities are permitted the other activities being forbidden. The NACE code should be used to list the permitted activities		9_RegulatedActivities
9_3_ForbiddenActivities	area in which specific activities are forbidden the other activities being permitted. The NACE code should be used to list the forbidden activities		9_RegulatedActivities
9_4_SuitableActivities	area in which specific activities are suitable. The NACE code should be used to list the suitable activities		9_RegulatedActivities
10_OtherSupplementaryRegulation	Supplementary regulation of other types, not yet listed		

5.2.8

6 Reference systems

6.1 Coordinate reference systems

6.1.1 Datum

IR Requirement 8 For the coordinate reference systems used for making available the INSPIRE spatial data sets, the datum shall be the datum of the European Terrestrial Reference System 1989 (ETRS89) in areas within its geographical scope, and the datum of the International Terrestrial Reference System (ITRS) or other geodetic coordinate reference systems compliant with ITRS in areas that are outside the geographical scope of ETRS89. Compliant with the ITRS means that the system definition is based on the definition of the ITRS and there is a

INSPIRE	Reference: D2.8.III.4_v2.9		
TWG-LU	Data Specification on <i>Land Use</i>	2012-02-23	Page 95

well-established and described relationship between both systems, according to EN ISO 19111.

6.1.2 Coordinate reference systems

IR Requirement 9 INSPIRE spatial data sets shall be made available using one of the three-dimensional, two-dimensional or compound coordinate reference systems specified in the list below.

Other coordinate reference systems than those listed below may only be used for regions outside of continental Europe. The geodetic codes and parameters for these coordinate reference systems shall be documented, and an identifier shall be created, according to EN ISO 19111 and ISO 19127.

1. Three-dimensional Coordinate Reference Systems
 - Three-dimensional Cartesian coordinates
 - Three-dimensional geodetic coordinates (latitude, longitude and ellipsoidal height), using the parameters of the GRS80 ellipsoid
2. Two-dimensional Coordinate Reference Systems
 - Two-dimensional geodetic coordinates, using the parameters of the GRS80 ellipsoid
 - Plane coordinates using the Lambert Azimuthal Equal Area projection and the parameters of the GRS80 ellipsoid
 - Plane coordinates using the Lambert Conformal Conic projection and the parameters of the GRS80 ellipsoid
 - Plane coordinates using the Transverse Mercator projection and the parameters of the GRS80 ellipsoid
3. Compound Coordinate Reference Systems
 - For the horizontal component of the compound coordinate reference system, one of the two-dimensional coordinate reference systems specified above shall be used.
 - For the vertical component on land, the European Vertical Reference System (EVRS) shall be used to express gravity-related heights within its geographical scope.
 - Other vertical reference systems related to the Earth gravity field shall be used to express gravity-related heights in areas that are outside the geographical scope of EVRS. The geodetic codes and parameters for these vertical reference systems shall be documented and an identifier shall be created, according to EN ISO 19111 and ISO 19127.
 - For the vertical component in the free atmosphere, barometric pressure, converted to height using ISO 2533:1975 International Standard Atmosphere shall be used.

6.1.3 Display

IR Requirement 10 For the display of the INSPIRE spatial data sets with the View Service specified in D003152/02 Draft Commission Regulation implementing Directive 2007/2/EC of the European Parliament and of the Council as regards Network Services, at least the two dimensional geodetic coordinate system shall be made available.

6.1.4 Identifiers for coordinate reference systems

INSPIRE	Reference: D2.8.III.4_v2.9		
TWG-LU	Data Specification on <i>Land Use</i>	2012-02-23	Page 96

IR Requirement 11 For referring to the non-compound coordinate reference systems listed in this Section, the identifiers listed below shall be used.

For referring to a compound coordinate reference system, an identifier composed of the identifier of the horizontal component, followed by a slash (/), followed by the identifier of the vertical component, shall be used.

- ETRS89-XYZ for Cartesian coordinates in ETRS89
- ETRS89-GRS80h for three-dimensional geodetic coordinates in ETRS89 on the GRS80 ellipsoid
- ETRS89-GRS80 for two-dimensional geodetic coordinates in ETRS89 on the GRS80
- EVRS for height in EVRS
- LAT for depth of the sea floor, where there is an appreciable tidal range
- MSL for depth of the sea floor, in marine areas without an appreciable tidal range, in open oceans and effectively in waters that are deeper than 200m
- ISA for pressure coordinate in the free atmosphere
- PFO for Pressure coordinate in the free ocean
- ETRS89-LAEA for ETRS89 coordinates projected into plane coordinates by the Lambert Azimuthal Equal Area projection
- ETRS89-LCC for ETRS89 coordinates projected into plane coordinates by the Lambert Conformal Conic projection
- ETRS89-TMzn for ETRS89 coordinates projected into plane coordinates by the Transverse Mercator projection

6.2 Temporal reference system

IR Requirement 12 The Gregorian calendar shall be used for as a reference system for date values, and the Universal Time Coordinated (UTC) or the local time including the time zone as an offset from UTC shall be used as a reference system for time values.

6.3 Theme-specific requirements and recommendations on reference systems

IR Requirement 1 Based on the INSPIRE horizontal coordinate reference system, each Member State shall define a projection or a set of projections suitable for working with the underlying cadastral parcels on national territory and cross-border areas where applicable for a SpatialPlan. A projection is suitable if it offers few linear alteration (ideally less than 50 cm per 500 m) and so enable users to measure distances and surfaces in meaningful way. This projection or set of projections has to be defined in agreement with neighbouring countries. This projection or set of projections must be well documented to allow the conversion from and to the common Coordinate Reference System. The documentation shall be provided according to ISO 19111, which states how a projected coordinate reference system must be described.

7 Data quality

This chapter includes a description of the data quality elements and sub-elements as well as the corresponding data quality measures that should be used to evaluate and document data quality for data sets related to the spatial data theme *Land Use* (section 7.1).

It may also define requirements or recommendations about the targeted data quality results applicable for data sets related to the spatial data theme *Land Use* (sections 7.2 and 7.3).

In particular, the data quality elements, sub-elements and measures specified in section 7.1 should be used for

- evaluating and documenting data quality properties and constraints of spatial objects, where such properties or constraints are defined as part of the application schema(s) (see section 5);
- evaluating and documenting data quality metadata elements of spatial data sets (see section 8); and/or
- specifying requirements or recommendations about the targeted data quality results applicable for data sets related to the spatial data theme *Land Use* (see sections 7.2 and 7.3).

The descriptions of the elements and measures are based on Annex D of ISO/DIS 19157 Geographic information – Data quality.

7.1 Data quality elements

Error! Reference source not found. lists all data quality elements and sub-elements that are being used in this specification. Data quality information can be evaluated at level of spatial object, spatial object type, dataset or dataset series. The level at which the evaluation is performed is given in the “Evaluation Scope” column.

The measures to be used for each of the listed data quality sub-elements are defined in the following sub-sections.

Section	Data quality element	Data quality sub-element	Definition	Evaluation Scope
7.1.1	Completeness	Commission	excess data present in the dataset, as described by the scope	dataset
7.1.2	Completeness	Omission	data absent from the dataset, as described by the scope	dataset
7.1.3	Logical consistency	Domain consistency	adherence of values to the value domains	dataset
7.1.4	Positional accuracy	Absolute or external accuracy	closeness of reported coordinate values to values accepted as or being true	dataset
7.1.5	Thematic accuracy	Classification correctness	comparison of the classes assigned to features or their attributes to a universe of discourse	dataset
7.1.6	Thematic accuracy	Non-quantitative attribute correctness	correctness of non-quantitative attributes	dataset

Table 4 – Data quality elements used in the spatial data theme *Land Use*

Recommendation 8 Where it is impossible to express the evaluation of a data quality element in a quantitative way, the evaluation of the element should be expressed with a textual statement as a data quality descriptive result.

7.1.1 Completeness – Commission

Recommendation 9 Commission should be evaluated and documented using rate of excess items as specified in the table below.

Name	Rate of excess
Alternative name	-
Data quality element	Completeness
Data quality sub-element	Commission
Data quality basic measure	Error rate
Definition	Number of excess items in the dataset in relation to the number of items that should have been present.
Description	This data quality element is not applicable to SELU or GELU. For ELU and PLU, the land use features (ExistingLandUseObject and ZoningElement) are mutually exclusive, therefore possible existence of polygons' excess can be managed by topological principles. This data quality element applies only for SupplementaryRegulation in PLU
Evaluation scope	Data set
Reporting scope	Data set
Parameter	-
Data quality value type	Real
Data quality value structure	Single value
Source reference	ISO/DIS 19157 Geographic information – Data quality
Example	Value 1,89 (measured or estimated value) means that 1,89 % of all features in SupplementaryRegulation element are excess items.
Measure identifier	3 (ISO 19157)

7.1.2 Completeness – Omission

Recommendation 10 Omission should be evaluated and documented using rate of missing items and missing item as specified in the tables below.

Name	Rate of missing items
Alternative name	-
Data quality element	Completeness
Data quality sub-element	Omission
Data quality basic measure	Error rate
Definition	Number of missing items in the dataset in relation to the number of items that should have been present.
Description	All land use features in schemas (ELU, PLU, SELU, GELU) should have at least one land use type defined as HILUCS value. Rate of missing items shows the known or estimated rate of the missing HILUCS values in relation to all land use features in a schema.
Evaluation scope	Data set
Reporting scope	Data set
Parameter	-
Data quality value type	Real
Data quality value structure	Single value
Source reference	ISO/DIS 19157 Geographic information – Data quality

INSPIRE	Reference: D2.8.III.4_v2.9		
TWG-LU	Data Specification on <i>Land Use</i>	2012-02-23	Page 99

Example	<p>Rate of missing items is set to 1.89 for ELU meaning that 1.89 % of all polygons are missing the HILUCS value.</p> <p>Rate of missing items for GELU dataset is set to 5 meaning 5 % of pixels are classified as “nodata”.</p> <p>Rate of missing items values 0 % are not reported (data is complete).</p>
Measure identifier	7 (ISO 19157)

Name	Missing item
Alternative name	-
Data quality element	Completeness
Data quality sub-element	Omission
Data quality basic measure	Error indicator
Definition	Indicator that shows that a specific item is missing in the data.
Description	<p>Indicator shall have value “true” when a certain land use type (HILUCS class) is missing in the dataset (data not collected) but that specific land use type exists (in real world) in the area the dataset covers and the data producer knows / recognizes that existence.</p> <p>Indicator shall have value “false” when a certain land use type is missing in the dataset and that land use type does not exist in the real world either.</p>
Evaluation scope	Data set
Reporting scope	Data set
Parameter	-
Data quality value type	Boolean (true indicates that an item is missing, false indicates that an item is missing in data and also in the real world)
Data quality value structure	Single value
Source reference	ISO/DIS 19157 Geographic information – Data quality
Example	<p>HILUCS class 3 “Services” does not exist in the dataset. When the data producer knows that this class occurs in the area the dataset covers he sets the missing item value for this class “true”. That indication covers also the sub-classes (3.1, 3.1.1. etc).</p> <p>HILUCS class 1.2 “Forestry use” data exists in the dataset but the sub-classes 1.2.1, 1.2.2 and 1.2.3 do not. Data producer knows that classes 1.2.2 and 1.2.3 exist in the area but 1.2.1 does not. Missing item will have value “true” for HILUCS classes 1.2.2 and 1.2.3 and a value “false” to 1.2.1.</p> <p>HILUCS class 1.2 “Forestry use” data exists in the dataset but sub-classes 1.2.1, 1.2.2 and 1.2.3 do not. Data producer does not know whether there exist sub-classes 1.2.1 - 1.2.3 in the area or not. Values for missing items are not set.</p>
Measure identifier	7 (ISO 19157)

7.1.3 Logical consistency – Domain consistency

Recommendation 11 Domain consistency should be evaluated and documented using value domain consistency rate as specified in the tables below.

Name	Domain consistency rate
Alternative name	-
Data quality element	Logical consistency

Data quality sub-element	Domain consistency
Data quality basic measure	Correct items rate
Definition	Number of items in the dataset that are in conformance with their value domain in relation to the total number of items in the data-set.
Description	Number of land use features having all the attribute values in conformance with the application schema. This element is valid for all land use schemas (ELU, PLU, SELU, PLU).
Evaluation scope	Data set
Reporting scope	Data set
Parameter	-
Data quality value type	Real
Data quality value structure	Single value
Source reference	ISO/DIS 19157 Geographic information – Data quality
Example	Value 98.11 means that 98.11 % of all features in a dataset have their attribute values in conformance with the application schema.
Measure identifier	17 (ISO 19157)

7.1.4 Positional accuracy – Absolute or external accuracy

Recommendation 12 Absolute or external accuracy should be evaluated and documented using mean value of positional uncertainties as specified in the table below.

Name	Mean value of positional uncertainties (2D)
Alternative name	-
Data quality element	Positional accuracy
Data quality sub-element	Absolute or external accuracy
Data quality basic measure	Not applicable
Definition	Mean value of the positional uncertainties for a set of positions where the positional uncertainties are defined as the distance between a measured position and what is considered as the corresponding true position.
Description	<p>Element is valid only for land use schemas ELU and PLU. Measurement unit is meters.</p> <p>For ELU a estimation of positional error in sampled points can be evaluated:</p> <p>For a number of points (N), the measured positions are given as x_{mi}, y_{mi} and z_{mi} coordinates depending on the dimension in which the position of the point is measured. A corresponding set of coordinates, x_{ti}, y_{ti} and z_{ti}, are considered to represent the true positions. The errors are calculated as</p> $e_i = \sqrt{(x_{mi} - x_{ti})^2 + (y_{mi} - y_{ti})^2}$ <p>The mean positional uncertainties of the horizontal absolute or external positions is then calculated as</p> $\bar{e} = \frac{1}{N} \sum_{i=1}^N e_i$ <p>A criterion for the establishing of correspondence should also be stated (e.g. allowing for correspondence to the closest position, correspondence on vertices or along lines, etc.). The</p>

	<p>criterion/criteria for finding the corresponding points shall be reported with the data quality evaluation result.</p> <p>NOTE: This data quality measure is different than the standard deviation.</p> <p>For PLU (polygons) the positional accuracy is portrayed as an estimated value based to the scale of the data as follows:</p> <table border="1"> <thead> <tr> <th>Scale, 1:n</th><th>Estimated geometric accuracy; normal data quality</th></tr> </thead> <tbody> <tr><td>1 000 000</td><td>500 m</td></tr> <tr><td>500 000</td><td>250 m</td></tr> <tr><td>250 000</td><td>125 m</td></tr> <tr><td>100 000</td><td>50 m</td></tr> <tr><td>50 000</td><td>25 m</td></tr> <tr><td>20 000</td><td>10 m</td></tr> <tr><td>10 000</td><td>5 m</td></tr> <tr><td>5 000</td><td>2,5 m</td></tr> <tr><td>2 000</td><td>1 m</td></tr> <tr><td>1 000</td><td>0,5 m</td></tr> </tbody> </table>	Scale, 1:n	Estimated geometric accuracy; normal data quality	1 000 000	500 m	500 000	250 m	250 000	125 m	100 000	50 m	50 000	25 m	20 000	10 m	10 000	5 m	5 000	2,5 m	2 000	1 m	1 000	0,5 m
Scale, 1:n	Estimated geometric accuracy; normal data quality																						
1 000 000	500 m																						
500 000	250 m																						
250 000	125 m																						
100 000	50 m																						
50 000	25 m																						
20 000	10 m																						
10 000	5 m																						
5 000	2,5 m																						
2 000	1 m																						
1 000	0,5 m																						
Evaluation scope	Data set																						
Reporting scope	Data set																						
Parameter	-																						
Data quality value type	Measure or real																						
Data quality value structure	-																						
Source reference	ISO/DIS 19157 Geographic information – Data quality																						
Example	<p>Value 30.5 for ELU dataset means that the mean positional uncertainty of a land use type (position of the outer limit) is ± 30.5 meters compared to the true position.</p> <p>Value 50 for PLU dataset means that dataset's estimated positional accuracy corresponds to the 1:100 000 scale.</p>																						
Measure identifier	28 (ISO 19157)																						

7.1.5 Thematic accuracy – Classification correctness

Recommendation 13 Classification correctness should be evaluated and documented using as misclassification rate specified in the table below.

Name	Misclassification rate
Alternative name	-
Data quality element	Thematic accuracy
Data quality sub-element	Classification correctness
Data quality basic measure	Error rate
Definition	Number of incorrectly classified features relative to the number of features that should be there.
Description	<p>Land use type classes in dataset in relation to the land use types in the real world.</p> <p>This element is used only for existing land use: ELU, SELU, GELU.</p>
Evaluation scope	Data set
Reporting scope	Data set
Parameter	-
Data quality value type	Real
Data quality value structure	
Source reference	ISO/DIS 19157 Geographic information – Data quality
Example	Value 1.89 indicates that 1.89 % of all features in a dataset (polygons, points or pixels) have different land use type than the

	corresponding feature in a real world.
Measure identifier	61 (ISO 19157)

7.1.6 Thematic accuracy – Non-quantitative attribute correctness

Recommendation 14 Non-quantitative attribute correctness should be evaluated and documented using rate of incorrect attribute values as specified in the table below.

Name	Rate of incorrect attribute values
Alternative name	-
Data quality element	Thematic accuracy
Data quality sub-element	Non-quantitative attribute correctness
Data quality basic measure	Error rate
Definition	Number of attribute values where incorrect values are assigned in relation to the total number of attribute values.
Description	This element is used only for planned land use: PLU (Zoning Element and SupplementaryRegulation) features and is used to non-quantitative attributes like Inspire-id, RegulationNature, ProcessStepGeneral and SupplementaryRegulationValue.
Evaluation scope	Data set
Reporting scope	Data set
Parameter	-
Data quality value type	Real ; percentage
Data quality value structure	
Source reference	ISO/DIS 19157 Geographic information – Data quality
Example	Value 1.89 means that 1.89 % of all non-quantitative attributes have incorrect value.
Measure identifier	67 (ISO 19157)

7.2 Minimum data quality requirements

No minimum data quality requirements are defined for the spatial data theme Land Use.

7.3 Recommendation on data quality

Recommendation 15 For the data quality elements listed in **Error! Reference source not found.**, all data sets related to the spatial data theme *Land Use* should meet the specified target results.

Section	Data quality element and sub-element	Measure name(s)	Target result(s)	Condition
7.1.1	Completeness - Commission	Error rate	0 %	
7.1.2	Completeness - Omission	Rate of missing items	0 %	
7.1.3	Logical consistency - Domain consistency	Correct items rate	Min 95 %	

7.1.4	Positional accuracy - Absolute or external	Estimation of positional error	Corresponding normal data quality (table above)	
7.1.5	Thematic accuracy - classification correctness	Error rate	Max 5 %	

Table 5 – Recommended minimum data quality results for spatial data theme Land Use

8 Dataset-level metadata

This section specifies dataset-level metadata elements, which should be used for documenting metadata for a complete dataset or dataset series.

NOTE Metadata can also be reported for each individual spatial object (spatial object-level metadata). Spatial object-level metadata is fully described in the application schema(s) (section 5).

For some dataset-level metadata elements, in particular those for reporting data quality and maintenance, a more specific scope can be specified. This allows the definition of metadata at sub-dataset level, e.g. separately for each spatial object type. When using ISO 19115/19157/19139 to encode the metadata, the following rules should be followed:

- The scope element (of type DQ_Scope) of the DQ_DataQuality subtype should be used to encode the reporting scope.

NOTE The reporting scope can be different from the evaluation scope (see section 7).

- Only the following values should be used for the level element of DQ_Scope: Series, Dataset, featureType.

NOTE The value featureType is used to denote spatial object type.

- If the level is featureType the levelDescription/MDScopeDescription/features element (of type Set< GF_FeatureType>) shall be used to list the feature type names.

Mandatory or conditional metadata elements are specified in Section 8.1. Optional metadata elements are specified in Section 8. The tables describing the metadata elements contain the following information:

- The first column provides a reference to a more detailed description.
- The second column specifies the name of the metadata element.
- The third column specifies the multiplicity.
- The fourth column specifies the condition, under which the given element becomes mandatory (only for Table 6 and Table 7).

8.1 Common metadata elements

IR Requirement 13 The metadata describing a spatial data set or a spatial data set series related to the theme **Land Use** shall comprise the metadata elements required by Regulation 1205/2008/EC (implementing Directive 2007/2/EC of the European Parliament and of the Council as regards metadata) for spatial datasets and

spatial dataset series (Table 6) as well as the metadata elements specified in Table 7.

Table 6 – Metadata for spatial datasets and spatial dataset series specified in Regulation 1205/2008/EC (implementing Directive 2007/2/EC of the European Parliament and of the Council as regards metadata)

Metadata Regulation Section	Metadata element	Multiplicity	Condition
1.1	Resource title	1	
1.2	Resource abstract	1	
1.3	Resource type	1	
1.4	Resource locator	0..*	Mandatory if a URL is available to obtain more information on the resource, and/or access related services.
1.5	Unique resource identifier	1..*	
1.7	Resource language	0..*	Mandatory if the resource includes textual information.
2.1	Topic category	1..*	
3	Keyword	1..*	
4.1	Geographic bounding box	1..*	
5	Temporal reference	1..*	
6.1	Lineage	1	
6.2	Spatial resolution	0..*	Mandatory for data sets and data set series if an equivalent scale or a resolution distance can be specified.
7	Conformity	1..*	
8.1	Conditions for access and use	1..*	
8.2	Limitations on public access	1..*	
9	Responsible organisation	1..*	
10.1	Metadata point of contact	1..*	
10.2	Metadata date	1	
10.3	Metadata language	1	

Table 7 – Mandatory and conditional common metadata elements

INSPIRE Data Specification Land Use Section	Metadata element	Multiplicity	Condition
8.1.1	Coordinate Reference System	1	
8.1.2	Temporal Reference System	0..*	Mandatory, if the spatial data set or one of its feature types contains temporal information that does not refer to the Gregorian Calendar or the Coordinated Universal Time.
8.1.3	Encoding	1..*	
8.1.4	Character Encoding	0..*	Mandatory, if an encoding is used that is not based on UTF-8.
8.1.5	Data Quality – Logical Consistency – Topological Consistency	0..*	Mandatory, if the data set includes types from the Generic Network Model and does not assure centreline topology (connectivity of centrelines) for the network.

8.1.1 Coordinate Reference System

Metadata element name	Coordinate Reference System
Definition	Description of the coordinate reference system used in the dataset.
ISO 19115 number and name	13. referenceSystemInfo
ISO/TS 19139 path	referenceSystemInfo
INSPIRE obligation / condition	mandatory
INSPIRE multiplicity	1
Data type(and ISO 19115 no.)	186. MD_ReferenceSystem
Domain	To identify the reference system, the referenceSystemIdentifier (RS_Identifier) shall be provided. NOTE More specific instructions, in particular on pre-defined values for filling the referenceSystemIdentifier attribute should be agreed among Member States during the implementation phase to support interoperability.
Implementing instructions	
Example	referenceSystemIdentifier: code: ETRS_89 codeSpace: INSPIRE RS registry

Example XML encoding	<pre> <gmd:referenceSystemInfo> <gmd:MD_ReferenceSystem> <gmd:referenceSystemIdentifier> <gmd:RS_Identifier> <gmd:code> <gco:CharacterString>ETRS89 </gco:CharacterString> </gmd:code> <gmd:codeSpace> <gco:CharacterString>INSPIRE RS registry</gco:CharacterString> </gmd:codeSpace> </gmd:RS_Identifier> </gmd:referenceSystemIdentifier> </gmd:MD_ReferenceSystem> </gmd:referenceSystemInfo> </pre>
Comments	

8.1.2 Temporal Reference System

Metadata element name	Temporal Reference System
Definition	Description of the temporal reference systems used in the dataset.
ISO 19115 number and name	13. referenceSystemInfo
ISO/TS 19139 path	referenceSystemInfo
INSPIRE obligation / condition	Mandatory, if the spatial data set or one of its feature types contains temporal information that does not refer to the Gregorian Calendar or the Coordinated Universal Time.
INSPIRE multiplicity	0..*
Data type(and ISO 19115 no.)	186. MD_ReferenceSystem
Domain	<p>No specific type is defined in ISO 19115 for temporal reference systems. Thus, the generic MD_ReferenceSystem element and its reference SystemIdentifier (RS_Identifier) property shall be provided.</p> <p>NOTE More specific instructions, in particular on pre-defined values for filling the referenceSystemIdentifier attribute should be agreed among Member States during the implementation phase to support interoperability.</p>
Implementing instructions	
Example	<pre> referenceSystemIdentifier: code: GregorianCalendar codeSpace: INSPIRE RS registry </pre>

INSPIRE	Reference: D2.8.III.4_v2.9		
TWG-LU	Data Specification on <i>Land Use</i>	2012-02-23	Page 107

Example XML encoding	<pre> <gmd:referenceSystemInfo> <gmd:MD_ReferenceSystem> <gmd:referenceSystemIdentifier> <gmd:RS_Identifier> <gmd:code> <gco:CharacterString>GregorianCalendar</gco:CharacterString > </gmd:code> <gmd:codeSpace> <gco:CharacterString>INSPIRE RS registry</gco:CharacterString> </gmd:codeSpace> </gmd:RS_Identifier> </gmd:referenceSystemIdentifier> </gmd:MD_ReferenceSystem> </gmd:referenceSystemInfo> </pre>
Comments	

8.1.3 Encoding

Metadata element name	Encoding
Definition	Description of the computer language construct that specifies the representation of data objects in a record, file, message, storage device or transmission channel
ISO 19115 number and name	271. distributionFormat
ISO/TS 19139 path	distributionInfo/MD_Distribution/distributionFormat
INSPIRE obligation / condition	mandatory
INSPIRE multiplicity	1
Data type (and ISO 19115 no.)	284. MD_Format
Domain	See B.2.10.4. The property values (name, version, specification) specified in section 9 shall be used to document the default and alternative encodings.
Implementing instructions	
Example	name: Land Use GML application schema version: version 2.9 , GML, version 3.2.1 specification: D2.8.III.4 Data Specification on Land Use – Draft Guidelines
Example XML encoding	<pre> <gmd:MD_Format> <gmd:name> <gco:CharacterString> Land Use GML application schema </gco:CharacterString> </gmd:name> <gmd:version> <gco:CharacterString>2.9, GML, version 3.2.1</gco:CharacterString> </gmd:version> <gmd:specification> <gco:CharacterString>D2.8.III.4 Data Specification on Land Use – Draft Guidelines</gco:CharacterString> </gmd:specification> </gmd:MD_Format> </pre>
Comments	

8.1.4 Character Encoding

Metadata element name	Character Encoding
Definition	The character encoding used in the data set.
ISO 19115 number and name	
ISO/TS 19139 path	
INSPIRE obligation / condition	Mandatory, if an encoding is used that is not based on UTF-8.
INSPIRE multiplicity	0..*
Data type (and ISO 19115 no.)	
Domain	
Implementing instructions	
Example	-
Example XML encoding	<pre><gmd:characterSet> <gmd:MD_CharacterSetCode codeListValue="8859part2" codeList="http://standards.iso.org/ittf/PubliclyAvailableStandards/I SO_19139_Schemas/resources/Codelist/ML_gmxCodetlists.xml#C haracterSetCode">8859-2</gmd:MD_CharacterSetCode> </gmd:characterSet></pre>
Comments	

8.1.5 Data Quality – Logical Consistency – Topological Consistency

Metadata element name	Data Quality – Logical Consistency – Topological Consistency
Definition	Correctness of the explicitly encoded topological characteristics of the dataset as described by the scope
INSPIRE obligation / condition	Mandatory, if the data set includes types from the Generic Network Model and does not assure centreline topology (connectivity of centrelines) for the network.
INSPIRE multiplicity	0..*
Comments	<p>See clauses on topological consistency in section 7 for detailed information.</p> <p>This metadata element is mandatory if connectivity is not assured for network centrelines in the dataset. In this case the <i>Connectivity tolerance</i> parameter – as described in section 7 – must be provided in order to ensure automatic and unambiguous creation of centreline topology in post-process.</p>

NOTE See section 8.2 for further instructions on how to implement metadata elements for reporting data quality.

8.2 Metadata elements for reporting data quality

Recommendation 16 For reporting the results of the data quality evaluation, the data quality elements, sub-elements and (for quantitative evaluation) measures defined in chapter 7 should be used.

The scope for reporting may be different from the scope for evaluating data quality (see section 7). If data quality is reported at the data set or spatial object type level, the results are usually derived or aggregated.

INSPIRE	Reference: D2.8.III.4_v2.9		
TWG-LU	Data Specification on <i>Land Use</i>	2012-02-23	Page 109

Recommendation 17 The metadata elements specified in the following tables should be used to report the results of the data quality evaluation. At least the information included in the row “Implementation instructions” should be provided.

The first table applies to reporting quantitative results (using the element DQ_QuantitativeResult), while the second table applies to reporting non-quantitative results (using the element DQ_DescriptiveResult).

NOTE These tables may need to be updated once the XML schemas for ISO 19157 have been finalised.

Metadata element name	See chapter 7
Definition	See chapter 7
ISO/DIS 19157 number and name	3. report
ISO/TS 19139 path	dataQualityInfo/*/report
INSPIRE obligation / condition	optional
INSPIRE multiplicity	0..*
Data type (and ISO/DIS 19157 no.)	Corresponding DQ_xxx subelement from ISO/DIS 19157, e.g. 12. DQ_CompletenessCommission
Domain	Lines 7-9 from ISO/DIS 19157 7. DQ_MeasureReference (C.2.1.3) 8. DQ_EvaluationMethod (C.2.1.4.) 9. DQ_Result (C2.1.5.)
Implementing instructions	39. nameOfMeasure NOTE This should be the name as defined in Chapter 7. 42. evaluationMethodType 43. evaluationMethodDescription NOTE If the reported data quality results are derived or aggregated (i.e. the scope levels for evaluation and reporting are different), the derivation or aggregation should also be specified using this property. 46. dateTime NOTE This should be data or range of dates on which the data quality measure was applied. 63. DQ_QuantitativeResult / 64. value NOTE The DQ_Result type should be DQ_QuantitativeResult and the value(s) represent(s) the application of the data quality measure (39.) using the specified evaluation method (42-43.)
Example	See Table E.12 — Reporting commission as metadata (ISO/DIS 19157)
Example XML encoding	

Metadata element name	See chapter 7
Definition	See chapter 7
ISO/DIS 19157 number and name	3. report
ISO/TS 19139 path	dataQualityInfo/*/report
INSPIRE obligation / condition	optional
INSPIRE multiplicity	0..*
Data type (and ISO/DIS 19157 no.)	Corresponding DQ_xxx subelement from ISO/DIS 19157, e.g. 12. DQ_CompletenessCommission

INSPIRE	Reference: D2.8.III.4_v2.9		
TWG-LU	Data Specification on <i>Land Use</i>	2012-02-23	Page 110

Domain	Line 9 from ISO/DIS 19157 9. DQ_Result (C2.1.5.)
Implementing instructions	67. DQ_DescriptiveResult / 68. statement NOTE The DQ_Result type should be DQ_DescriptiveResult and in the statement (68.) the evaluation of the selected DQ sub-element should be expressed in a narrative way.
Example	See Table E.15 — Reporting descriptive result as metadata (ISO/DIS 19157)
Example XML encoding	

Open issue 1: For reporting compliance with minimum data quality requirements and recommendations specified in section 7, the INSPIRE conformity metadata element should be used. However, since this issue is part of the larger discussion on the Abstract Test Suite and the definition of conformance classes for the data specification, detailed instructions on how to provide metadata on compliance with minimum data quality requirements and recommendations will only be provided for v3.0.

8.3 Theme-specific metadata elements

No mandatory theme-specific metadata elements are defined for this theme.

No optional theme-specific metadata elements are defined for this theme.

Recommendation 18 The metadata describing a spatial data set or a spatial data set series related to the theme *Land Use* should comprise the theme-specific metadata elements specified in Table 8.

Table 8 – Optional theme-specific metadata elements for the theme *Land Use*

Section	Metadata element	Multiplicity
8.3.1	Maintenance Information	0..1
8.3.2	Spatial Resolution	0..1
8.3.3	Data Quality – Completeness - Commission	0..*
8.3.4	Data Quality – Completeness - Omission	0..*
8.3.5	Data Quality – Logical Consistency – Domain consistency	0..*
8.3.6	Data Quality – Positional accuracy – Absolute or external accuracy	0..*
8.3.7	Data Quality – Thematic accuracy – Classification correctness	0..*

8.3.1 Maintenance Information

Metadata element name	Maintenance information
Definition	Information about the scope and frequency of updating
ISO 19115 number and name	30. resourceMaintenance
ISO/TS 19139 path	identificationInfo/MD_Identification/resourceMaintenance
INSPIRE obligation / condition	optional
INSPIRE multiplicity	0..1

INSPIRE	Reference: D2.8.III.4_v2.9		
TWG-LU	Data Specification on <i>Land Use</i>	2012-02-23	Page 111

Data type(and ISO 19115 no.)	142. MD_MaintenanceInformation
Domain	<p>This is a complex type (lines 143-148 from ISO 19115). At least the following elements should be used (the multiplicity according to ISO 19115 is shown in parentheses):</p> <ul style="list-style-type: none"> – maintenanceAndUpdateFrequency [1]: frequency with which changes and additions are made to the resource after the initial resource is completed / domain value: MD_MaintenanceFrequencyCode – updateScope [0..*]: scope of data to which maintenance is applied / domain value: MD_ScopeCode – maintenanceNote [0..*]: information regarding specific requirements for maintaining the resource / domain value: free text
Implementing instructions	
Example	
Example XML encoding	
Comments	

8.3.2 Spatial Resolution

	Spatial Resolution
Definition	Information about the spatial resolution of the dataset providing hints to estimate the minimum unit of interest
ISO 19115 number and name	38. spatialResolution
ISO/TS 19139 path	IdentificationInfo/MD_DataIdentification/spatialResolution
INSPIRE obligation / condition	optional
INSPIRE multiplicity	0..1
Data type (and ISO 19115 no.)	59. MD_Resolution
Domain	This is a complex type (lines 60-61 from ISO 19115). At least one of the applicable elements must be used: equivalentScale: level of detail expressed as the scale of a comparable hardcopy map or chart distance: ground sample distance
Implementing instructions	
Example	
Example XML encoding	
Comments	

8.3.3 Data Quality – Completeness - Commission

	Data Quality – Completeness - Commission
Definition	DQ Completeness: presence and absence of features, their attributes and their relationships; Commission: excess data present in the dataset, as described by the scope.
ISO 19115 number and name	18. dataQualityInfo
ISO/TS 19139 path	dataQualityInfo
INSPIRE obligation / condition	optional
INSPIRE multiplicity	0..*
Data type (and ISO 19115 no.)	109. DQ_CompletenessCommission
Domain	Lines 100-107 from ISO 19115
Implementing instructions	
Example	
Example XML encoding	
Comments	See clause 7.1.1 in Chapter 7 for detailed information

INSPIRE	Reference: D2.8.III.4_v2.9		
TWG-LU	Data Specification on <i>Land Use</i>	2012-02-23	Page 112

8.3.4 Data Quality – Completeness - Omission

	Data Quality – Completeness - Omission
Definition	Data absent from the dataset, as described by the scope
ISO 19115 number and name	18. dataQualityInfo
ISO/TS 19139 path	dataQualityInfo
INSPIRE obligation / condition	optional
INSPIRE multiplicity	0..*
Data type (and ISO 19115 no.)	110. DQ_CompletenessOmission
Domain	Lines 100-107 from ISO 19115
Implementing instructions	
Example	
Example XML encoding	
Comments	See clause 7.1.2 in Chapter 7 for detailed information

8.3.5 Data Quality – Logical Consistency – Domain consistency

	Data Quality – Logical Consistency – Domain consistency
Definition	Adherence of values to the value domain
ISO 19115 number and name	18. dataQualityInfo
ISO/TS 19139 path	dataQualityInfo
INSPIRE obligation / condition	optional
INSPIRE multiplicity	0..*
Data type (and ISO 19115 no.)	113. DQ_DomainConsistency
Domain	Lines 100-107 from ISO 19115
Implementing instructions	
Example	
Example XML encoding	
Comments	See clause 7.1.4 in Chapter 7 for detailed information

8.3.6 Data Quality – Positional accuracy – Absolute or external accuracy

	Data Quality – Positional accuracy – Absolute or external accuracy
Definition	Closeness of reported coordinate values to values accepted as or being true
ISO 19115 number and name	18. dataQualityInfo
ISO/TS 19139 path	dataQualityInfo
INSPIRE obligation / condition	optional
INSPIRE multiplicity	0..*
Data type (and ISO 19115 no.)	117. DQ_AbsoluteExternalPositionalAccuracy
Domain	Lines 100-107 from ISO 19115
Implementing instructions	
Example	
Example XML encoding	
Comments	See clause 7.1.7 in Chapter 7 for detailed information

8.3.7 Data Quality – Thematic accuracy – Classification correctness

	Data Quality – Thematic accuracy – Classification correctness
Definition	Comparison of the classes assigned to features or their attributes to a universe of discours
ISO 19115 number and name	18. dataQualityInfo

INSPIRE	Reference: D2.8.III.4_v2.9		
TWG-LU	Data Specification on <i>Land Use</i>	2012-02-23	Page 113

ISO/TS 19139 path	dataQualityInfo
INSPIRE obligation / condition	optional
INSPIRE multiplicity	0..*
Data type (and ISO 19115 no.)	125. DQ_ThematicClassificationCorrectness
Domain	Lines 100-107 from ISO 19115
Implementing instructions	
Example	
Example XML encoding	
Comments	See clause 7.1.10 in Chapter 7 for detailed information

8.4 Guidelines on using metadata elements defined in Regulation 1205/2008/EC

8.4.1 Conformity

The *Conformity* metadata element defined in Regulation 1205/2008/EC allows to report the conformance with the Implementing Rule for interoperability of spatial data sets and services or another specification. The degree of conformity of the dataset can be *Conformant* (if the dataset is fully conformant with the cited specification), *Not Conformant* (if the dataset does not conform to the cited specification) or *Not evaluated* (if the conformance has not been evaluated).

Recommendation 19 The Conformity metadata element should be used to report conceptual consistency with this INSPIRE data specification. The value of Conformant should be used for the Degree element only if the dataset passes all the requirements described in the abstract test suite presented in Annex A. The Specification element should be given as follows:

- title: "INSPIRE Data Specification on <Theme Name> – Draft Guidelines"
- date:
 - dateType: publication
 - date: 2012-02-23

Open issue 2: Conformance testing is still an open issue under discussion.

Instructions on conformance testing and a common abstract test suite (including detailed instructions on how to test specific requirements) will be added at a later stage.

This may also lead to an update of the recommendations on how to fill the conformity metadata element.

8.4.2 Lineage

Recommendation 20 Following the ISO 19113 Quality principles, if a data provider has a procedure for quality validation of their spatial data sets then the data quality elements listed in the Chapters 7 and 8 should be used. If not, the *Lineage* metadata element (defined in Regulation 1205/2008/EC) should be used to describe the overall quality of a spatial data set.

According to Regulation 1205/2008/EC, lineage "is a statement on process history and/or overall quality of the spatial data set. Where appropriate it may include a statement whether the data set has

INSPIRE	Reference: D2.8.III.4_v2.9		
TWG-LU	Data Specification on <i>Land Use</i>	2012-02-23	Page 114

been validated or quality assured, whether it is the official version (if multiple versions exist), and whether it has legal validity. The value domain of this metadata element is free text”.

The Metadata Technical Guidelines based on EN ISO 19115 and EN ISO 19119 specify that the statement sub-element of LI_Lineage (EN ISO 19115) should be used to implement the lineage metadata element.

Recommendation 21 To describe the transformation steps and related source data, it is recommended to use the following sub-elements of LI_Lineage:

- For the description of the transformation process of the local to the common INSPIRE data structures, the LI_ProcessStep sub-element should be used.
- For the description of the source data the LI_Source sub-element should be used.

NOTE 1 This recommendation is based on the conclusions of the INSPIRE Data Quality Working Group to avoid overloading of the overall lineage statement element with information on the transformation steps and related source data.

NOTE 2 In order to improve the interoperability, domain templates and instructions for filling these free text elements (descriptions) may be specified in an Annex of this data specification.

Open issue 3: The suggested use of the LI_Lineage sub-elements needs to be discussed as part of the maintenance of the INSPIRE metadata Technical Guidelines.

8.4.3 Temporal reference

According to Regulation 1205/2008/EC, at least one of the following temporal reference metadata elements shall be provided: temporal extent, date of publication, date of last revision, date of creation. If feasible, the date of the last revision of a spatial data set should be reported using the *Date of last revision* metadata element.

8.4.4 Keywords

Keywords are used to classify resource to facilitate effective discovery and thematic discovery. The keyword value is a commonly used word, formalised word or phrase used to describe the subject and thus help narrowing a full text search and they allow for structured keyword search.

IR Requirement 1 Data providers shall include the following keywords in addition to the mandatory keywords defined in Commission regulation (EC) 1205/2008/

Type of Land Use dataset (Mandatory): this is required to enable distinction whether the dataset refers to ExistingLandUse, SampledExistingLandUse, GriddedExistingLandUse or PlannedLandUse (SpatialPlan)

SpatialPlan#levelOfSpatialPlan (Mandatory): this is an essential information to identify whether it is a structural plan a zoning plan or a construction plan

INSPIRE	Reference: D2.8.III.4_v2.9		
TWG-LU	Data Specification on <i>Land Use</i>	2012-02-23	Page 115

9 Delivery

9.1 Delivery medium

TG Requirement 2 Data conformant to this INSPIRE data specification shall be made available through an INSPIRE network service.

TG Requirement 3 All information that is required by a calling application to be able to retrieve the data through the used network service shall be made available in accordance with the requirements defined in the Implementing Rules on Network Services.

EXAMPLE 1 Through the Get Spatial Objects function, a download service can either download a pre-defined data set or pre-defined part of a data set (non-direct access download service), or give direct access to the spatial objects contained in the data set, and download selections of spatial objects based upon a query (direct access download service). To execute such a request, some of the following information might be required:

- the list of spatial object types and/or predefined data sets that are offered by the download service (to be provided through the Get Download Service Metadata operation),
- and the query capabilities section advertising the types of predicates that may be used to form a query expression (to be provided through the Get Download Service Metadata operation, where applicable),
- a description of spatial object types offered by a download service instance (to be provided through the Describe Spatial Object Types operation).

EXAMPLE 2 Through the Transform function, a transformation service carries out data content transformations from native data forms to the INSPIRE-compliant form and vice versa. If this operation is directly called by an application to transform source data (e.g. obtained through a download service) that is not yet conformant with this data specification, the following parameters are required:

Input data (mandatory). The data set to be transformed.

- Source model (mandatory, if cannot be determined from the input data). The model in which the input data is provided.
- Target model (mandatory). The model in which the results are expected.
- Model mapping (mandatory, unless a default exists). Detailed description of how the transformation is to be carried out.

9.2 Encodings

9.2.1 Default Encoding(s)

TG Requirement 4 Data conformant to the application schema(s) defined in section 5 shall be encoded using the encoding(s) specified in this section.

9.2.1.1. Default encoding for application schema Existing Land Use

Name: ExistingLandUse.xsd GML Application Schema

Version: version <version of the GML Application Schema>, GML, version 3.2.1

Specification: D2.8.III.4 Data Specification on **Land Use** – Draft Guidelines

Character set: UTF-8

9.2.1.2. Default encoding for application schema Sampled Existing Land Use

Name: SampledExistingLandUse.xsd GML Application Schema

INSPIRE	Reference: D2.8.III.4_v2.9		
TWG-LU	Data Specification on <i>Land Use</i>	2012-02-23	Page 116

Version: version 2.9, GML, version 3.2.1

Specification: D2.8.III.4 Data Specification on **Land Use** – Draft Guidelines

Character set: UTF-8

9.2.1.3. Default encoding for application schema Gridded Existing Land Use

Name: GriddedExistingLandUse.xsd GML Application Schema

Version: version 2.9, GML, version 3.2.1

Specification: D2.8.III.4 Data Specification on **Land Use** – Draft Guidelines

Character set: UTF-8

9.2.1.4. Default encoding for application schema Planned Land use

Name: PlannedLandUse.xsd GML Application Schema

Version: version 2.9, GML, version 3.2.1

Specification: D2.8.III.4 Data Specification on **Land Use** – Draft Guidelines

Character set: UTF-8

The GML Application Schemas are distributed in a zip-file separately from the data specification document.

9.2.2 Alternative Encoding(s)

Recommendation 22 It is recommended that also the encodings specified in this section be provided for the relevant application schemas.

9.2.2.1. Alternative encoding for application schema Gridded Existing Land Use

Open issue 4: Encoding of Gridded Existing Land Use should be harmonized with the Land cover theme.

Name: <name of the format>

Version: <version of format>

Specification: <specification reference>

Character set: <character set>

9.2.2.1.1. Encoding rule(s) used

10 Data Capture

There is no specific guidance required with respect to data capture.

11 Portrayal

This clause defines the rules for layers and styles to be used for portrayal of the spatial object types defined for this theme.

INSPIRE	Reference: D2.8.III.4_v2.9		
TWG-LU	Data Specification on <i>Land Use</i>	2012-02-23	Page 117

In section 11.1, the *types* of layers are defined that are to be used for the portrayal of the spatial object types defined in this specification. A view service may offer several layers of the same type, one for each dataset that it offers on a specific topic.

Section 0 specifies the styles that shall be supported by INSPIRE view services for each of these layer types.

In section **Error! Reference source not found.**, further styles can be specified that represent examples of styles typically used in a thematic domain. It is recommended that also these styles should be supported by INSPIRE view services, where applicable.

Where XML fragments are used in these sections, the following namespace prefixes apply:

- sld="http://www.opengis.net/sld" (WMS/SLD 1.1)
- se="http://www.opengis.net/se" (SE 1.1)
- ogc="http://www.opengis.net/ogc" (FE 1.1)

IR Requirement 2 If an INSPIRE view services supports the portrayal of data related to the theme **Land Use**, it shall provide layers of the types specified in this section.

TG Requirement 5 If an INSPIRE view network service supports the portrayal of spatial data sets corresponding to the spatial data theme **Land Use**, it shall support the styles specified in section 0.

If no user-defined style is specified in a portrayal request for a specific layer to an INSPIRE view service, the default style specified in section 0 for that layer shall be used.

Recommendation 1 In addition to the styles defined in section 0, it is recommended that, where applicable, INSPIRE view services also support the styles defined in section **Error! Reference source not found.**

11.1 Layers to be provided by INSPIRE view services

Layer Name	Layer Title	Spatial object type(s)	Keywords
LandUse.ExistingLand Use	Existing Land Use objects according to the Hierarchical INSPIRE Land Use Classification System at level 1	ExistingLandUseObject	Land Use
LandUse.SpatialPlan	Spatial planning Zoning objects according to the Hierarchical INSPIRE Land Use Classification System at level 1	ZoningElement	Land Use, Spatial Plan
LandUse.Supplementary Regulation	Regulations that supplement the zoning and that affect the use of land	SupplementaryRegulation	Land Use, Spatial Plan, regulation zone

11.1.1 Layers organisation

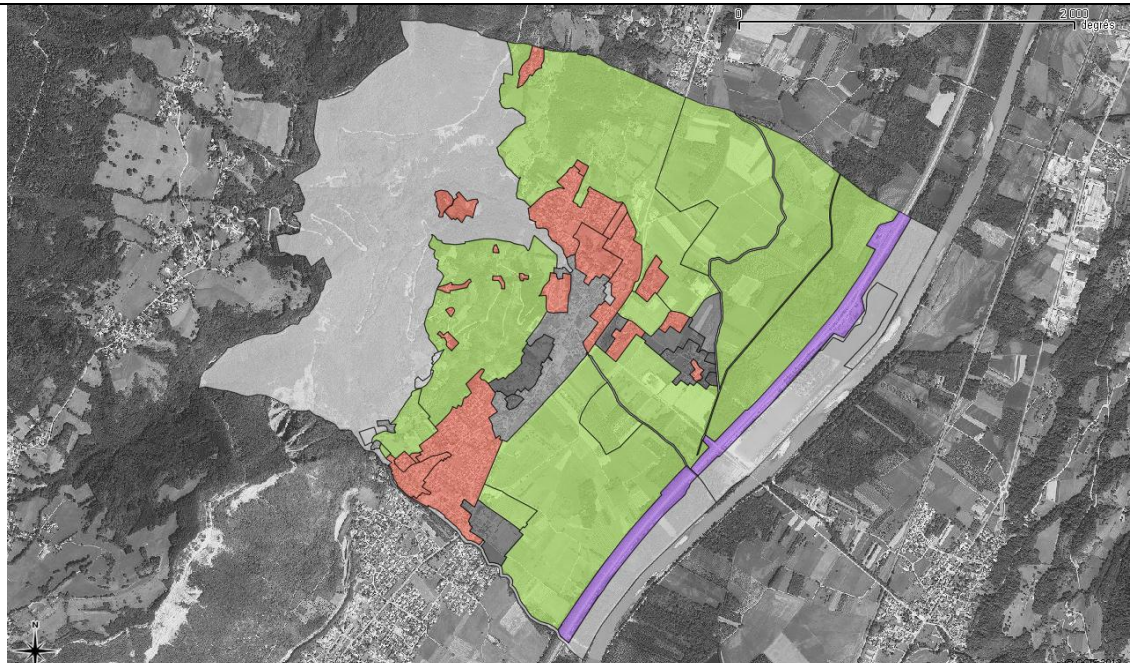
Recommendation 23 it is recommended that any INSPIRE view service that display land use layers also display layers from INSPIRE view services associated with annex I or II themes such as cadastral parcels, transport networks, geographical names, hydrography or orthoimagery.

11.2 Styles to be supported by INSPIRE view services

11.2.1 Styles for the layer LandUse.ExistingLandUse

Style Name	LandUse.ExistingLandUse.Default				
Default Style	yes				
Style Title	Existing Land Use Default Style				
Style Abstract	Existing Land Use objects filled with a colour depending on the value of the attribute from HILUCS level 1 nomenclature and their boundaries as black lines of 2 pixels				
	<i>HILUCS level 1</i>	<i>colour</i>	<i>red</i>	Green	blue
	1_PrimaryProduction	"yellow-green"	180	230	110
	2_SecondaryProduction	"dark grey"	100	100	100
	3_TertiaryProduction	"grey"	150	150	150
	4_TransportNetworkdLogisticsAndUtilities	"purple"	180	120	240
	5_ResidentialAreasWithOtherCompatibleUse	"red"	240	120	100
	6_OtherUses	"off-white"	220	220	220
	Some data providers may be willing to make adjustments to the above colour chart in order to provide a better interpretation of the different land uses at first sight. These adjustments should be as limited as possible and should stick to the color convention above.				

INSPIRE	Reference: D2.8.III.4_v2.9		
TWG-LU	Data Specification on <i>Land Use</i>	2012-02-23	Page 119

	For example one may differentiate agricultural use from the forestry use, depict the water bodies underneath or differentiate the various type of other uses. The possible adjustments are given below:				
	<i>HILUCS level 2</i>	<i>coulour</i>	<i>red</i>	Green	blue
	1_PrimaryProduction	"yellow-green"	180	230	110
	1_1_AgriculturalUse	"yellow"	230	230	110
	1_2_Forestry	"green"	110	230	110
	2_SecondaryProduction	"dark grey"	100	100	100
	3_TertiaryProduction	"grey"	150	150	150
	4_TransportNetworkdLogisticsAndUtilities	"purple"	180	120	240
	4_1_4_WaterTraffic	"blue purple"	140	120	240
	5_ResidentialAreasWithOtherCompatibleUse	"red"	240	120	100
	6_OtherUses	"off-white"	220	220	220
	6_3_1_LandAreasInNaturalUse	"green off-white"	200	255	200
	6_3_2_WaterAreasInNaturalUse	"blue off-white"	200	200	255
Symbology	The SLD specifying the symbology is distributed in a file separately from the data specification document.				
Minimum & maximum scales	to be provided by the data provider (it depends on the Minimum Unit of Interest (MUI) as provided in the Metadata)				
Example					

11.2.2 Styles for the layer LandUse.SpatialPlan

Style Name	LandUse.SpatialPlan.Default
Default Style	yes

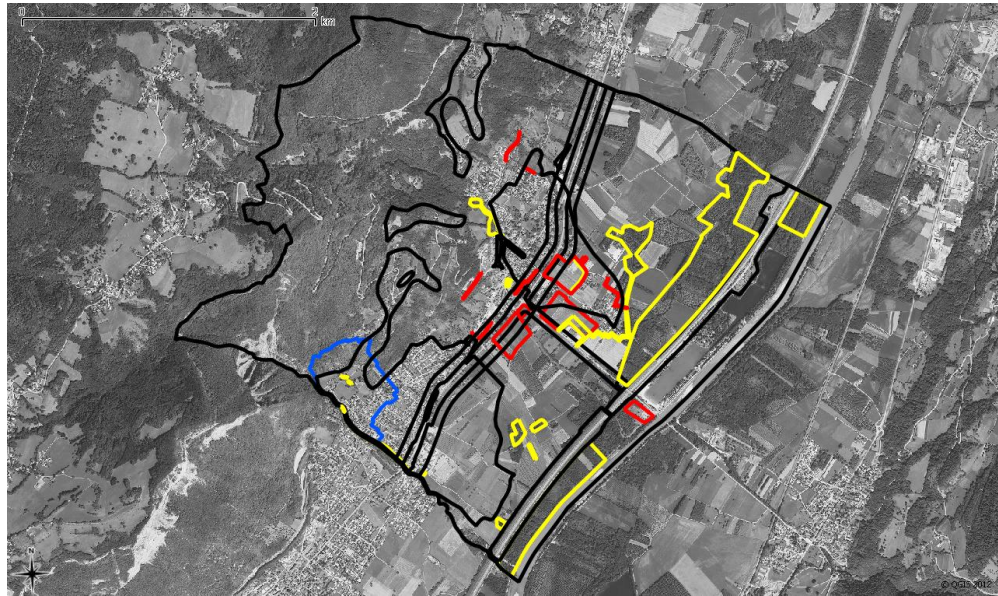
Style Title	Planned Land Use Default Style																																																																																																			
Style Abstract	Planned Land Use objects filled with a colour depending on the value of the attribute from HILUCS level 1 nomenclature and their boundaries as black lines of 2 pixels																																																																																																			
	<table><tr><td>HILUCS level 1</td><td>colour</td><td>red</td><td>Green</td><td>blue</td></tr><tr><td>1_PrimaryProduction</td><td>“yellow-green”</td><td>180</td><td>230</td><td>110</td></tr><tr><td>2_SecondaryProduction</td><td>“dark grey”</td><td>100</td><td>100</td><td>100</td></tr><tr><td>3_TertiaryProduction</td><td>“grey”</td><td>150</td><td>150</td><td>150</td></tr><tr><td>4_TransportNetworkdLogisticsAndUtilities</td><td>“purple”</td><td>180</td><td>120</td><td>240</td></tr><tr><td>5_ResidentialAreasWithOtherCompatibleUse</td><td>“red”</td><td>240</td><td>120</td><td>100</td></tr><tr><td>6_OtherUses</td><td>“off-white”</td><td>220</td><td>220</td><td>220</td></tr></table> <p>Some data providers may be willing to make adjustments to the above colour chart in order to provide a better interpretation of the different land uses at first sight. These adjustments should be as limited as possible and should stick to the color convention above.</p> <p>For example one may differentiate agricultural use from the forestry use, depict the water bodies underneath or differentiate the various type of other uses. The possible adjustments are given below:</p> <table><tr><td>HILUCS level 2</td><td>colour</td><td>red</td><td>Green</td><td>blue</td></tr><tr><td>1_PrimaryProduction</td><td>“yellow-green”</td><td>180</td><td>230</td><td>110</td></tr><tr><td>1_1_AgriculturalUse</td><td>“yellow”</td><td>230</td><td>230</td><td>110</td></tr><tr><td>1_2_Forestry</td><td>“green”</td><td>110</td><td>230</td><td>110</td></tr><tr><td>2_SecondaryProduction</td><td>“dark grey”</td><td>100</td><td>100</td><td>100</td></tr><tr><td>3_TertiaryProduction</td><td>“grey”</td><td>150</td><td>150</td><td>150</td></tr><tr><td>4_TransportNetworkdLogisticsAndUtilities</td><td>“purple”</td><td>180</td><td>120</td><td>240</td></tr><tr><td>4_1_4_WaterTraffic</td><td>“blue purple”</td><td>140</td><td>120</td><td>240</td></tr><tr><td>5_ResidentialAreasWithOtherCompatibleUse</td><td>“red”</td><td>240</td><td>120</td><td>100</td></tr><tr><td>6_OtherUses</td><td>“off-white”</td><td>220</td><td>220</td><td>220</td></tr><tr><td>6_3_1_LandAreasInNaturalUse</td><td>“green off-white”</td><td>200</td><td>255</td><td>200</td></tr><tr><td>6_3_2_WaterAreasInNaturalUse</td><td>“blue off-white”</td><td>200</td><td>200</td><td>255</td></tr></table>					HILUCS level 1	colour	red	Green	blue	1_PrimaryProduction	“yellow-green”	180	230	110	2_SecondaryProduction	“dark grey”	100	100	100	3_TertiaryProduction	“grey”	150	150	150	4_TransportNetworkdLogisticsAndUtilities	“purple”	180	120	240	5_ResidentialAreasWithOtherCompatibleUse	“red”	240	120	100	6_OtherUses	“off-white”	220	220	220	HILUCS level 2	colour	red	Green	blue	1_PrimaryProduction	“yellow-green”	180	230	110	1_1_AgriculturalUse	“yellow”	230	230	110	1_2_Forestry	“green”	110	230	110	2_SecondaryProduction	“dark grey”	100	100	100	3_TertiaryProduction	“grey”	150	150	150	4_TransportNetworkdLogisticsAndUtilities	“purple”	180	120	240	4_1_4_WaterTraffic	“blue purple”	140	120	240	5_ResidentialAreasWithOtherCompatibleUse	“red”	240	120	100	6_OtherUses	“off-white”	220	220	220	6_3_1_LandAreasInNaturalUse	“green off-white”	200	255	200	6_3_2_WaterAreasInNaturalUse	“blue off-white”	200	200	255
	HILUCS level 1	colour	red	Green	blue																																																																																															
	1_PrimaryProduction	“yellow-green”	180	230	110																																																																																															
	2_SecondaryProduction	“dark grey”	100	100	100																																																																																															
	3_TertiaryProduction	“grey”	150	150	150																																																																																															
	4_TransportNetworkdLogisticsAndUtilities	“purple”	180	120	240																																																																																															
	5_ResidentialAreasWithOtherCompatibleUse	“red”	240	120	100																																																																																															
	6_OtherUses	“off-white”	220	220	220																																																																																															
	HILUCS level 2	colour	red	Green	blue																																																																																															
	1_PrimaryProduction	“yellow-green”	180	230	110																																																																																															
	1_1_AgriculturalUse	“yellow”	230	230	110																																																																																															
	1_2_Forestry	“green”	110	230	110																																																																																															
	2_SecondaryProduction	“dark grey”	100	100	100																																																																																															
	3_TertiaryProduction	“grey”	150	150	150																																																																																															
	4_TransportNetworkdLogisticsAndUtilities	“purple”	180	120	240																																																																																															
	4_1_4_WaterTraffic	“blue purple”	140	120	240																																																																																															
	5_ResidentialAreasWithOtherCompatibleUse	“red”	240	120	100																																																																																															
	6_OtherUses	“off-white”	220	220	220																																																																																															
	6_3_1_LandAreasInNaturalUse	“green off-white”	200	255	200																																																																																															
	6_3_2_WaterAreasInNaturalUse	“blue off-white”	200	200	255																																																																																															
Symbology	The SLD specifying the symbology is distributed in a file separately from the data specification document.																																																																																																			
Minimum & maximum scales	to be provided by the data provider (it depends on the type of spatial plan, i.e. structural plan, zoning plan or construction plan)																																																																																																			



11.2.3 Styles for the layer LandUse.SupplementaryRegulation

Style Name	LandUse.SupplementaryRegulation.Default
Default Style	yes
Style Title	Supplementary Regulation Default Style
Style Abstract	Contour or line of the Supplementary regulation depicted by a colour line of two pixels, colour depending of the value of the attribute supplementaryRegulation Symbol for point supplementary regulation
Symbology	The SLD specifying the symbology is distributed in a file separately from the data specification document.
Minimum & maximum scales	to be provided by the data provider (it depends on the type of spatial plan, i.e. structural plan, zoning plan or construction plan)

Example



INSPIRE	Reference: D2.8.III.4_v2.9		
TWG-LU	Data Specification on <i>Land Use</i>	2012-02-23	Page 123

Bibliography

- [DS-D2.3] INSPIRE DS-D2.3, Definition of Annex Themes and Scope, v3.0, http://inspire.jrc.ec.europa.eu/reports/ImplementingRules/DataSpecifications/D2.3_Definition_of_Annex_Themes_and_scope_v3.0.pdf
- [DS-D2.5] INSPIRE DS-D2.5, Generic Conceptual Model, v3.3, http://inspire.jrc.ec.europa.eu/documents/Data_Specifications/D2.5_v3_3.pdf
- [DS-D2.6] INSPIRE DS-D2.6, Methodology for the development of data specifications, v3.0, http://inspire.jrc.ec.europa.eu/reports/ImplementingRules/DataSpecifications/D2.6_v3.0.pdf
- [DS-D2.7] INSPIRE DS-D2.7, Guidelines for the encoding of spatial data, v3.2, http://inspire.jrc.ec.europa.eu/documents/Data_Specifications/D2.7_v3.2.pdf
- [ISO 19101] EN ISO 19101:2005 Geographic information – Reference model (ISO 19101:2002)
- [ISO 19103] ISO/TS 19103:2005, Geographic information – Conceptual schema language
- [ISO 19107] EN ISO 19107:2005, Geographic information – Spatial schema (ISO 19107:2003)
- [ISO 19108] EN ISO 19108:2005 Geographic information - Temporal schema (ISO 19108:2002)
- [ISO 19111] EN ISO 19111:2007 Geographic information - Spatial referencing by coordinates (ISO 19111:2007)
- [ISO 19115] EN ISO 19115:2005, Geographic information – Metadata (ISO 19115:2003)
- [ISO 19118] EN ISO 19118:2006, Geographic information – Encoding (ISO 19118:2005)
- [ISO 19135] EN ISO 19135:2007 Geographic information – Procedures for item registration (ISO 19135:2005)
- [ISO 19139] ISO/TS 19139:2007, Geographic information – Metadata – XML schema implementation
- [OGC 06-103r3] Implementation Specification for Geographic Information - Simple feature access – Part 1: Common Architecture v1.2.0

Delete any of these references or add further references as applicable.

INSPIRE	Reference: D2.8.III.4_v2.9		
TWG-LU	Data Specification on <i>Land Use</i>	2012-02-23	Page 124

Annex A (normative)

Abstract Test Suite

Any dataset conforming to this INSPIRE data specification shall meet all requirements specified in this document.

Open issue 5: Conformance testing is still an open issue under discussion.

Instructions on conformance testing and a common abstract test suite (including detailed instructions on how to test specific requirements) will be added at a later stage.

Annex B (informative) Use cases

B.1 Introduction

The use cases section intends to sum up the understanding of the Thematic Working Group on Land Use after having reviewed 47 use cases and 26 reference materials provided by the SDICs and the LMOs and after having conducted interviews to ascertain the user requirements. The objective of a use case is to give a description of situations where land use datasets are required to perform a given task. These use cases are documented in order to understand how the requirements have been filtered in view of designing a conceptual model generic enough to cover potential use cases and simple enough to minimise the burden on the shoulder of data producers and uses.

Sections B2 to B5 identify the use cases considered relevant and express the requirements in broad terms. Four use cases have been selected as representative of those reported by SDICS and LMOs to the land use thematic working group:

- land planning,
- analysis of land consumption,
- ecological network mapping,
- greenhouse inventory reporting.

Users' information collection was sometimes heterogeneous, for these reason these four use cases have been fully documented using the INSPIRE template to reach a harmonization with other themes. Figure 10 provides an overview of the use cases regarding the type of land use that is required, the temporality of the required land use data, (either past, present of future land use) and the type of activities that requires land use data.

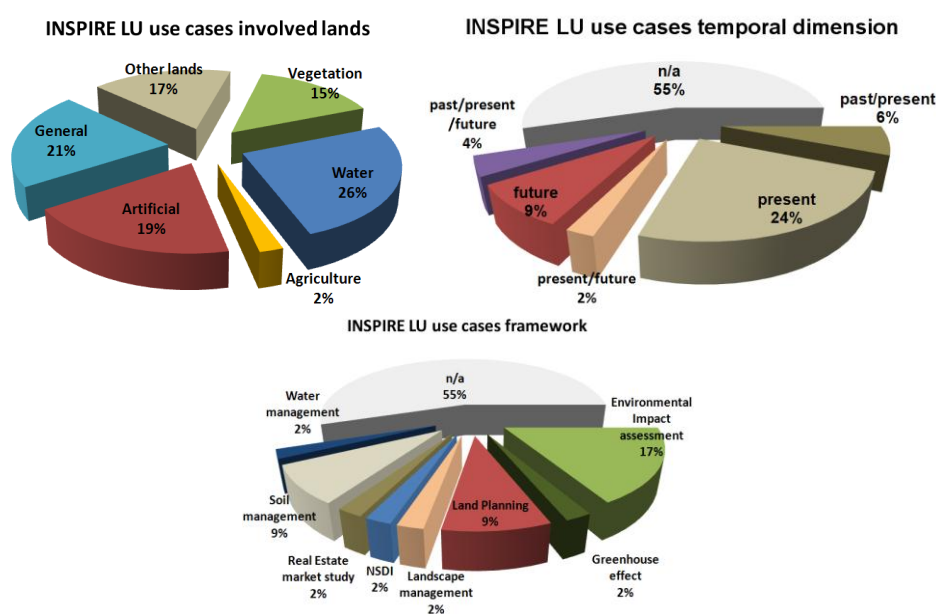


Figure 1 – Graphs of use cases study about lands involved, temporal dimension and context of use (framework).

INSPIRE	Reference: D2.8.III.4_v2.9		
TWG-LU	Data Specification on <i>Land Use</i>	2012-02-23	Page 126

Four other use cases are also presented although less detailed in section B6: Land use for environmental impact assessment, Land use for the flood directive, Statistics for Land Use, Land use for soil management

Sections B7 to B8 sum up the data requirements as resulting from the use case analysis. They are presented for both existing and planned land use. It expresses the main requirements regarding the features that need to be taken into consideration, the nomenclature to be used, the temporal dimension, identifiers, portrayal, metadata and requirements for consistency with other themes. It also identifies requirements that have been omitted mainly due to expected difficulties in meeting them.

The previous ‘use cases’ presentation are based on the current process of data management, and the resulting requirements imperfectly reflect the real user needs. In practice the users handle the accessible data that are most suitable for their objectives but not necessarily the optimal data that best meet their requirements. In many cases optimal data are not available because they may not exist, have technical limitations or are unaffordable. So a complementary review of actual users’ requirements has been used to improve the data specification: the detailed requirements inventory from ICT PSP HLANDATA¹⁹ project about creation of value-added services based on Harmonized Land Use and Land Cover Datasets.

As an INSPIRE theme, Land Use belongs to a domain where little standardisation has occurred in Europe. Land use is also often mixed with Land Cover both in term of available datasets and user requirements.

Land use is perceived as the actual existing land use as it can be observed in reality as well as the intention of authorities for the future land use expressed via spatial plans.

The Nomenclature issue is one of the key requirements. It is felt important to: on the one hand make progress towards a simple but agreed nomenclature applicable throughout Europe; and on the other hand be able to accommodate local nomenclatures that correspond to local usage and culture.

B.2 Land Planning

B.2.1 Narrative description

Regional/spatial planning is a “scientific discipline, an administrative technique and a policy developed as an interdisciplinary and comprehensive approach directed towards a balanced regional development and the physical organisation of space according to an overall strategy²⁰”.

The spatial planning process produces Land Use regulation. Three main steps are usually defined:

- the elaboration step which includes diagnostics of the current situation of a given area and proposed scenarios for its development
- the adoption step that usually involves a democratic discussion on the selected scenario
- the “opposition to third parties” step when the Land Use regulation comes into force and is applicable to any further changes to the physical organisation and use of space.

Once adopted, the Land Use regulation (Spatial Plan) is an instrument to implement the choices regarding the spatial-structural development of a certain area. It orders the land use and is composed of two binding parts: a graphic map that indicates on which area the plan is applied and the belonging textual planning requirements. For the majority of the European countries, with the notable exception of the Netherlands, the spatial plan printed on paper and signed by the appropriate authority is the only document that is “opposable to third parties” its digital form having no legal status.

¹⁹ www.hlandata.eu

²⁰ From the European Regional/Spatial Planning Charter adopted in 1983 by CEMAT the European Conference of Ministers responsible for Regional Planning

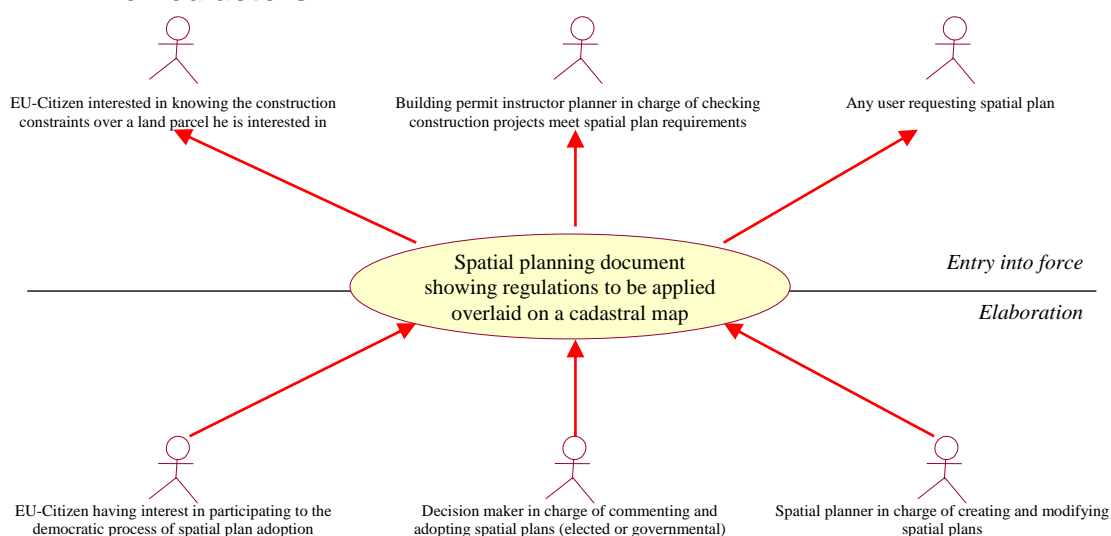
INSPIRE	Reference: D2.8.III.4_v2.9		
TWG-LU	Data Specification on <i>Land Use</i>	2012-02-23	Page 127

As far as the elaboration step and the adoption step are concerned, the main Land Use requirement is related to the datasets that describe existing Land Use at present and in the past. The issue is related to the understanding of the driving forces that shaped the land, i.e. understanding why the land looks like it is in the reality. Having the trajectory of the land changes with time allows modelling what land tends to be in the future.

Planned Land Use is the result of the planning process. It provides the graphical and textual regulation that will control the future shaping of the land through the land uses that will be permitted or forbidden. The usage of Planned Land Use is twofold:

- On the one hand the “land law enforcement²¹” (or land right implementation) is the process of delivering the appropriate authorisation needed for constructing a building, a road, a railway, or any human built artefact. The full land use regulation (spatial plan) is required for the process to be fully legal and to minimize the number of disputes. Having access to the digital facsimile of the legal document may avoid going back to the paper. Users are to be identified as the citizen, the architect, the promoter, or any person or organisation that requests the authorisation to build something, but also the entity that instructs and delivers the authorisation.
- On the other hand the “land monitoring study” is the process of understanding the land evolution through time and the effect of land policies on land. The full land use regulation (spatial plan) is not requested, only the graphic map is often required with some degree of simplification. Users are professionals such as land planners, geographers, and decision makers including the elected people.

B.2.2 Involved actors



B.2.3 Detailed description

Use Case Description	
Name	Spatial planning documents
Priority	High
Description	<p>Graphical representations of regulations that have a spatial extent, i.e. applicable to a piece of land, as well as facilities and constructions that pre-exist in the real world are needed to provide a map background for orientation and to understand spatial relationships.</p> <p>It usually includes the representation of zoning elements, buffer zones around geographical objects that create restriction on neighbouring parcels as well as cadastral boundaries and topographic elements like e.g. hydrographical elements (surface waters), infrastructure, settlements, administrative units, geographical names, existing Land Use, etc.</p> <p>One of the main purposes of maps is to communicate spatial information to the general public and/or</p>

²¹ application du droit des dols

INSPIRE	Reference: D2.8.III.4_v2.9		
TWG-LU	Data Specification on <i>Land Use</i>	2012-02-23	Page 128

Use Case Description	
	experts in an understandable form and to support communication.
Pre-condition	Feature classification as reference data or defined rules to choose reference elements (features, dimensions). Portrayal: Generalisation and symbol assignment rules for reference data and spatial planning related information Another possibility could be to have a set of previous existing spatial plan as raster data.
Flow of Events – 1- Elaboration Path	
Step 1.	Spatial planner request required geographical data from partners in order to create diagnostic map stating the current status of his area of interest, to devise scenarios for future development and to provide them to local government decision makers for comment
Step 2	Interested body to access proposed and preferred scenarios for future area development and provide comments
Step 3	Decision maker to provide selected development scenario for public hearing and interested parties in view of adopting final spatial plan that enter into force at a given date
Flow of Events – 2- entry into force Paths	
Step 4	Landlords, mandated body, construction permit instructor to access enforced spatial plan in order to check compatibility between construction projects at a given address or on a given parcel and applicable regulation from the enforced spatial plan
Step 5	Any other interested body to access enforced spatial plans for spatial analysis
Step 6	Delivery of seamless and as far as possible harmonized requested spatial planning documents
Post-condition	Layers coming from different thematic DB must be merged into a seamless and harmonized way
Data source: Topographic Reference Data	
Description	Topographic and cadastral reference data There are 2 levels –or roles- in which topographical data are required: Topographic data as a visual background. The aim is here to help locating any zone in its surrounding. Topographic data as a tool for spatial analysis.
Data provider	Mapping and cadastral agency (national or local governments).
Geographic scope	Various (regional, local)
Thematic scope	Spatial information supporting orientation on maps and understanding of spatial relationships. The aim of topographic data is to help locate phenomena in its surrounding.
Scale, resolution	The scale of data depends on the spatial planning level. At the municipal level it ranges from 1:25 000 to 1:5 000. The data can be modelled in 2D geometry. There are no specific topological constraints on these data.
Delivery	GIS-Raster files, GIS-Vector-files
Documentation	Metadata
Data source: Thematic information	
Description	Various sorts of thematic information such as census data, economic information
Data provider	Competent authorities including local governments
Geographic scope	Various (regional, local)
Thematic scope	Various (depends on the purpose)
Scale, resolution	Various (depends on the purpose)
Delivery	GIS-Raster files, GIS-Vector-files, GML-files, WFS
Documentation	Metadata, Model description

TWG	Affected	path	Datasets affected
Administrative Units (AU)	Yes	both	Boundaries of administrative units from the municipal to national borders, including geo-names.
Addresses (AD)	Yes	both	Address of entities
Area management/restriction/regulation zones and reporting units (AM)	Yes	both	Restriction zones Regulation zones
Cadastral Parcels (CP)	Yes	both	Identification of properties
Coordinate reference systems	Yes	both	Local reference system enabling easy distance measurement
LandUse (LU)	Yes	both	residential areas / zones/districts // rural communities industrial areas agriculture forest
Protected Sites (PS)	Yes	both	Ecologic landscape heritage
TransportNetwork (TN)	Yes	both	inland waterway (channels) Roads Railways
Orthoimagery (OI)	Yes	both	orthophotos (Georeferenced) historical (ortho)photos
Agricultural and aquacultural facilities (AF)	Yes	1	with regards to adverse consequences for economic activities and environment (accidental pollution) with regards to economic capacity
Bio-geographical regions + Habitats and biotopes +	Yes	1	with regards to protection of the environment

INSPIRE	Reference: D2.8.III.4_v2.9		
TWG-LU	Data Specification on <i>Land Use</i>	2012-02-23	Page 129

TWG	Affected	path	Datasets affected
Species distribution (BR-HB-SD)			
Buildings	Yes	1	Contour, height, Use (e.g. agriculture, industrial, commerce, service, etc.) Bridges, tunnels levees, dikes, dams
Elevation (EL)	Yes	1	contour lines (lines that join points of equal elevation) slope/hillside profile fall/gradient of slope, base slope coastline
Energy Resources	Yes	1	any
Geographical grid systems	Yes	1	Population density or similar coverage information
Geographical names (GN)	Yes	1	name of locations/areas
Geology + Mineral resources (GE-MR)	marginal	1	geology: rock (Limestone, chalk, sandstone), Permeability Landforms (geomorphology)
Hydrography (HY)	Yes	1	Physical waters (watercourses, lakes) dams
LandCover (LC)	Yes	1	All classes
Natural Risk Zones	Yes	1	Risk maps Risk prevention plans
Production and industrial facilities (PF)	Yes	1	with regards to economic activities with regards to economic assets
Statistical Units + Population distribution, demography (SU-PD)	Yes	1	Census data (> population density etc.) and other population distribution data
Utility and governmental services (US)	Yes	1	Water supply Sewerage system Energy supply Cable communication networks Administration centres/infrastructure Maintenance of supply and vulnerability
Soil (SO)	marginal		Permeability/Surface Sealing

B.3 Analysis of land consumption

B.3.1 Narrative description

The analysis of land consumption is required in many countries as the urban sprawl operates over the agricultural and natural areas. In some countries, municipalities will have to set objectives limiting the land consumption by urban area with mechanism to monitor the way the objectives are met. In the context of sustainable development where economic, social and environmental concerns are balanced, it is important to evaluate the justification of the land consumption by the urban sprawl. It is thus important to have knowledge of the existing land use and the area where the spatial plans project to open area for settlements and commercial or industrial activities and the like and for new communication links.

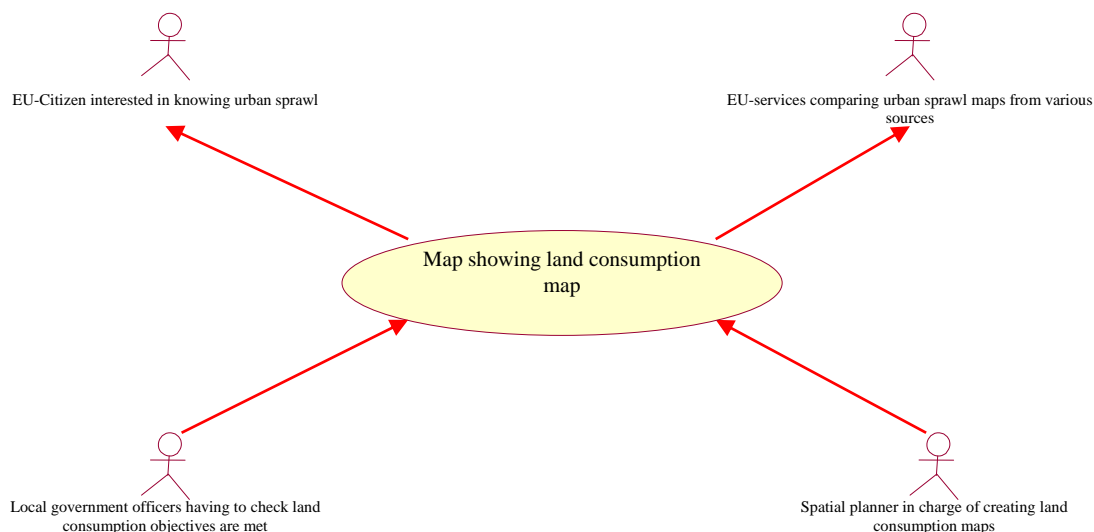
Urban sprawl is an intrinsic dimension of urbanization, which underlies the processes of spatial diffusion occurring in most developed countries. As modern cities become more complex also the phenomena of urban sprawl become increasingly faceted and diversified. One major aspect of novelty in the current trends is that sprawl does not only affect the use of land but has also an impact on the social, functional and economic spheres of urban life. It may also extend on different spatial levels, affecting not only cities and their surrounding areas but also whole metropolitan regions. Urban economists tend to examine urban sprawl as the aggregate extent of urban land use or as the average urban land use density. It has been shown that urban sprawl can increase the aggregate urban land use and lower the average land use density while at the same time lowering average commuting travel times and increasing discretionary mobility

In Europe several projects aim at detecting changes in existing land cover/use vector data (e.g. DeCOVER2 is a German project to develop algorithms in that area for updating the ATKIS-DLM digital landscape model of Germany, BNTK biotopes and land use map by the federal agency of environment in Germany). Remote sensing data is often used to do the change detection. Because

INSPIRE	Reference: D2.8.III.4_v2.9		
TWG-LU	Data Specification on <i>Land Use</i>	2012-02-23	Page 130

the input and output datasets use different classifications interoperability knowledge on mapping between classifications using ontologies is required.

B.3.2 Involved actors



B.3.3 Detailed description

Use Case Description	
Name	Land consumption mapping
Priority	High
Description	Land consumption monitoring enables to monitor the land parcels that change their usage. The issue is both to detect the changes and to understand for a given parcel from which usage it is turned into a new usage. It is thus an issue where comparison of land use maps over time at the parcel level is important. Urban sprawl is considered acceptable when the rate of urban sprawling is similar to the population increase.
Pre-condition	Feature classification as reference data or defined rules to choose reference elements (features, dimensions). Portrayal: Generalisation and symbol assignment rules for reference data and Land use related information
Flow of Events – 1- Path	
Step 1.	The user is requesting two existing land use datasets with their specific classification systems covering a given area but providing information at a different time. He may also requests recent orthophotos
Step 2	Based on the specific classification systems he groups the various classes into equivalent more generic classes as well as classes representing the urban nature of land use
Step 3	Applying the generic classes to each datasets and overlaying them on top of the orthophoto the user can then build a new dataset in which for each polygon the generic land use is attached at time T1 and at time T2. He can then produce a map and statistics showing how the land use has evolved between the two time slots. Based on the urban nature classes and the population information, the user can assess whether the area has been densified or sprawling regarding the change of population distribution and increase.
Post-condition	Layers coming from different thematic DB must be merged into a seamless and harmonized way
Data source: Land use Data	
Description	Existing land use data sets at two different dates are required. The scale range should be at the parcel level in order to draw an accurate urban extent. Key land classes must be considered such as agricultural use, forestry use, natural space, built-up area, etc.
Data provider	Mapping and cadastral agency (national or local governments).
Geographic scope	Various (regional, local)
Thematic scope	Land use
Scale, resolution	For land consumption analysis the scale range is around 1:25.000, for the resulting urban sprawl map 1:100.000 may be preferred
Delivery	GIS-Raster files, GIS-Vector-files
Documentation	Metadata
Data source: Thematic information	
Description	Population distribution and activity figures (such as local GNP measure or VAT figures)
Data provider	Competent authorities including local governments
Geographic scope	Various (regional, local)
Thematic scope	Various (depends on the purpose)
Scale, resolution	Various (depends on the purpose)

INSPIRE	Reference: D2.8.III.4_v2.9		
TWG-LU	Data Specification on <i>Land Use</i>	2012-02-23	Page 131

Use Case Description	
Delivery	GIS-Raster files, GIS-Vector-files, GML-files, WFS
Documentation	Metadata, Model description

TWG	Affected	Datasets affected
Administrative Units (AU)	Yes	Boundaries of administrative units from the municipal to national borders, including toponyms.
Buildings	Yes	Contour, height, Use
Cadastral Parcels (CP)	Yes	Identification of parcel limits
Elevation (EL)	Yes	slope/hillside profile
Geographical grid systems	Yes	Population density or similar coverage information
Land Cover (LC)	Yes	All classes
Land Use (LU)	Yes	residential areas / zones/districts // rural communities, industrial areas, agriculture, forest
Natural Risk Zones	Yes	Risk maps
Orthoimagery (OI)	Yes	orthoimages (Georeferenced) historical orthophotos
Production and industrial facilities (PF)	Yes	with regards to economic activities
Protected Sites (PS)	Yes	Ecologic landscape heritage
Statistical Units + Population distribution, demography (SU-PD)	Yes	Census data (> population density etc.) and other population distribution data
Transport Network (TN)	Yes	inland waterway (channels), Roads, Railways, Bridges, tunnels

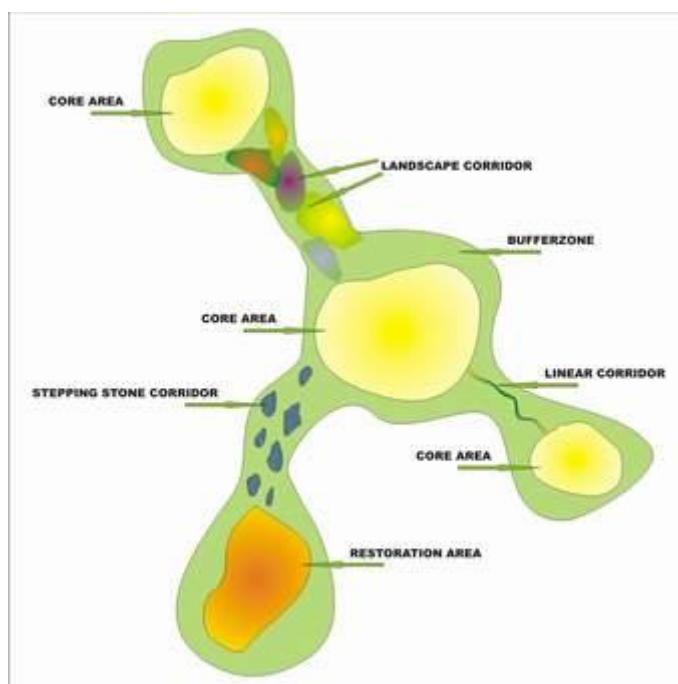
B.4 Ecological network map

B.4.1 Narrative description

Ecological network is a system of the most valuable sites, important for protection of threatened species, habitat types, ecological systems or landscapes. Ecological network sites must be relatively close to each other and connected with corridors, which allow them to communicate and exchange species.

In order for ecological network to function, all of its parts must be designated:

- **Core areas** – areas with ecological conditions that enable preservation of important ecosystems, habitat types and species;
- **Corridors** – features that connect core areas like “bridges”, enabling species to migrate and communicate. There are 3 types of corridors:
 - Linear corridors – continuous elements distinctively different from the surrounding nature parts and not intensively used (rivers, tree lines, hedges etc.)
 - Landscape corridors – landscape belts connecting core areas
 - Stepping stone corridors – not continuous in structure but enabling ecological network to function (system of water habitat types important for migratory birds etc.)
- **Buffer zones** – protecting ecological network from negative surrounding influences (pollution, drainage etc.);
- **Restoration areas** – occasionally it is necessary to restore or re-establish degraded habitat types as parts of ecological network, in order for it to function

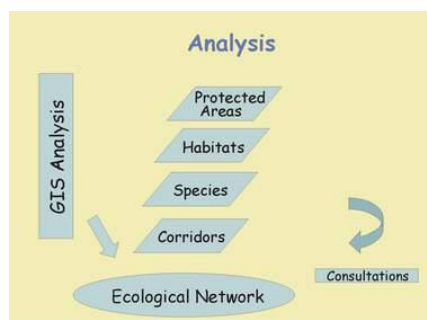


The legal basis of the ecological network programs includes

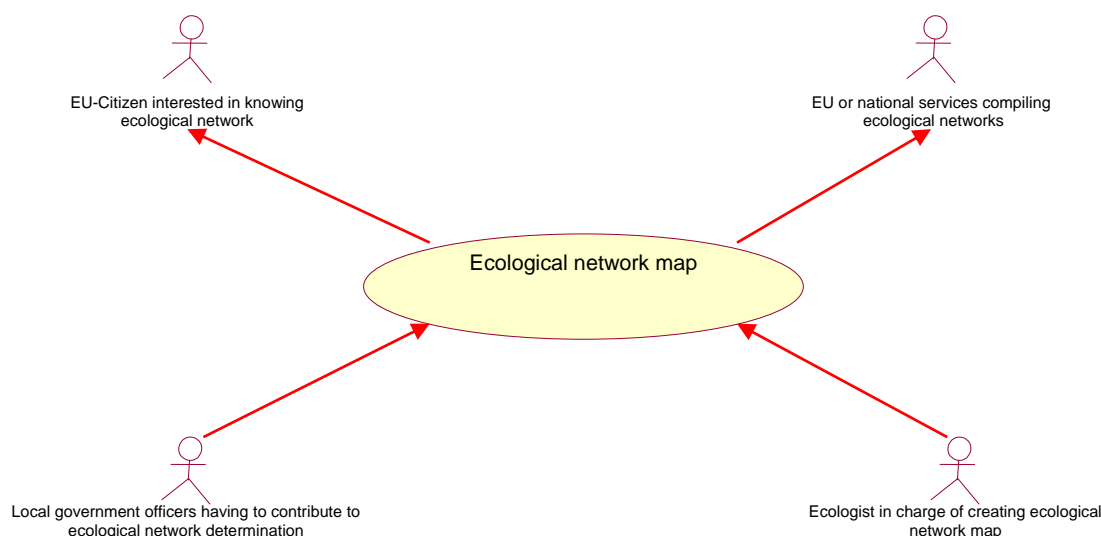
- NATURA 2000 – Habitat Directive (Council Directive 92/43/EEC)
- Emerald Network – The Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention)
- National Ecological Network – national nature protection legislation

Ecological networks are structured hierarchically. That means its parts (core areas, corridors, buffer zones and restoration areas) can be distinguished on different levels: International, Regional, National, Local. Each part of the ecological network has a different role depending on the network level. For example, core areas of the local ecological network (small zoological reserve, forest etc.) can be only a part of the higher-level ecological network corridor.

The methodology for creating ecological network is based on the analysis of 'key' (usually threatened) species and habitat types distribution. Starting point for this analysis is a mapping process, which is best to be done using GIS technology. By overlapping species distribution maps, maps of habitat types and maps of protected areas, one can determine areas with highest density of priority species and habitats and evaluate those areas from the nature protection point of view. That way one can determine whether or not those areas are situated within existing boundaries of protected areas; if the boundaries of protected areas are appropriate for biological diversity protection or if they should be modified; if buffer zones around core areas are being created; if corridors for key species communication are being planned and eventually if restoration areas, where needed, are being established.



B.4.2 Involved actors



B.4.3 Detailed description

Use Case Description	
Name	Ecological network mapping
Priority	High
Description	Determination of biodiversity reservoirs, corridors, buffer zones and restoration area
Pre-condition	analysis of 'key' (usually threatened) species and habitat types distribution. By overlapping species distribution maps, maps of habitat types and maps of protected areas, one can determine areas with highest density of priority species and habitats and evaluate those areas from the nature protection point of view.
Flow of Events – 1- Path	
Step 1.	Determination of the biodiversity reservoirs (Forest environments, Xeric open habitats, Wetlands, Water bodies, Semi-extensive farming community, Coastal environments) and identification of corridors (agricultural areas and natural open space)
Step 2	Determination of geographical elements that fragment the corridors (built up areas, main linear transport network, dams) and determination of conflictual zones
Step 3	Identification of buffer zones (identifying the human pressure on land) and restoration area (area that require special attention to restore a more favourable condition for biodiversity)
Step 4	Mapping of the ecological network overlaid on a topographic elements and geonames
Post-condition	Layers coming from different thematic DB must be merged into a seamless and harmonized way
Data source: Land use Data	
Description	Existing land use data sets identifying the agricultural and forestry uses, and the usage that fragment the land (industrial area, services zones, residential area, networks) as well as the land not in use.
Data provider	Mapping and cadastral agency (national or local governments).
Geographic scope	Various (regional, local)
Thematic scope	Land use
Scale, resolution	For ecological network analysis the scale range is around 1:100.000 for the a vision at regional scale that need to be taken into account in spatial planning documents at operational level,
Delivery	GIS-Raster files, GIS-Vector-files
Documentation	Metadata
Data source: reference information	
Description	Topographic data
Data provider	Mapping agencies
Geographic scope	Various (regional, local)
Thematic scope	Various (depends on the purpose)
Scale, resolution	Various (depends on the purpose)
Delivery	GIS-Raster files, GIS-Vector-files, GML-files, WFS
Documentation	Metadata, Model description

TWG	Affected	Datasets affected
Elevation (EL)	Yes	slope/hillside profile altitude
LandCover (LC)	Yes	All classes
LandUse (LU)	Yes	All classes
Production and industrial facilities (PF)	Yes	with regards to economic activities an pressure on the environment

Protected Sites (PS)	Yes	boundaries of protected areas appropriate for biological diversity protection
TransportNetwork (TN)	Yes	inland waterway (channels) Roads Railways Bridges, tunnels
Agricultural and aquacultural facilities (AF)	yes	
Area management/restriction/regulation zones and reporting units (AM)	yes	
Bio-geographical regions + Habitats and biotopes + Species distribution (BR-HB-SD)	yes	
Geographical names (GN)	yes	
Hydrography (HY)	yes	

B.5 Land use and land-use change and forestry for greenhouse inventory reporting

B.5.1 Narrative description

This Use Case describes shortly the employment of National and International Land Cover and Land Use Changes databases, according to the obligations of UN's FCCC²² and Kyoto protocol, with the objective to calculate environmental indicators. LULUCF²³ is defined by the UN Climate Change Secretariat as "A greenhouse gas inventory sector that covers emissions and removals of greenhouse gases resulting from direct human-induced land use, land-use change and forestry activities".

Note: The term 'Land Use', here can be considered according to two Inspire themes: Land Cover and Land Use, because there is a mixture of land cover and land use concepts and terms in UN' FCCC and Kyoto protocol, especially when considering land 'use' changes categories.

Considering the different categories in land use and land use changes for GI according to IPCC²⁴, in each country it is necessary to select the most appropriate method for identifying and representing land areas as consistently as possible in inventory calculations. These categories and subcategories are described in the Good Practices guidelines for LULUCF and necessary for GHG²⁵ inventory reporting:

- Forest land (F): All land with woody vegetation consistent with thresholds used to define forest land in the national GHG inventory, sub-divided into managed and unmanaged.
- Cropland (C): Arable and tillage land, and agro-forestry systems where vegetation falls below the thresholds used for the forest land category.
- Grassland (G): Range lands and pasture land that is not considered as cropland. It also includes systems with vegetation that fall below the threshold used in the forest land category, without human intervention. It also includes all grassland from wild lands to recreational areas as well as agricultural and silvi-pastoral systems, managed and unmanaged.
- Wetlands (W): Managed and unmanaged land that is covered or saturated by water for all or part of the year and that does not fall into the forest land, cropland, grassland or settlements categories. It includes reservoirs, rivers and lakes.

²² United Nations Framework Convention for Climate Change (UNFCCC)

²³ Land Use and Land-Use Change and Forestry (LULUCF)

²⁴ Intergovernmental Panel on Climate Change (IPCC)

²⁵ Greenhouse Gas (GHG)

- Settlements (S): All developed land, including transportation infrastructure and human settlements of any size.
- Other land (O): It includes bare soil, rock, ice, and all unmanaged land areas that do not fall into any of the other five categories

And the subsequent subcategories defined for in Land Use Changes:

FF	forest land remaining forest land	LF	lands converted to forest land
GG	grassland remaining grassland	LG	lands converted to grassland
CC	cropland remaining cropland	LC	lands converted to cropland
WW	wetlands remaining wetlands	LW	lands converted to wetlands
SS	settlements remaining settlements	LS	lands converted to settlements
OO	other land remaining other land	LO	lands converted to other land

The way to proceed in each country will be (step by step)

1. Choice of estimation method within the context of the IPCC Guidelines. Where three possible approaches can be identified, depending on availability and accuracy of National GI:

- Use of Basic Land Use data, which can or can not cover the whole territory. It is recommended to have an account of the land data for the different Land Use categories, one for each reference year, but without further explanation of land use changes from one category to another. Only a global flow of gains and losses for each class can be estimated, but no inter-categories changes are identified.
- Survey of Land Use and Land Use change provides a national or regional-scale assessment of inter-categories changes, not only gains and losses. Tracking land use changes in this explicit manner will normally require estimation of initial and final land use categories, as well as of total area of unchanged land by category. The final result of this approach can be presented as a non-spatially explicit land use change matrix.
- Use of geographically explicit land use data. Approach 3 is comprehensive and relatively simple conceptually but data intensive to implement. The target area is subdivided into spatial units such as grid cells or polygons appropriate to the scale of land use variation and the unit size required for sampling or complete enumeration. The spatial units must be used consistently over time or bias will be introduced into the sampling. The spatial units should be sampled using pre-existing map data (usually within GIS²⁶) and/or in the field and the land uses should be observed or inferred and recorded at the time intervals required. Observations may be from remote sensing, site visits, oral interviews, or questionnaires. Sampling units may be points or areas from 0.1 ha to a square kilometre or more, depending on the sample design. Units can be sampled statistically on a sparser interval than would be used for the complete coverage, chosen at regular or irregular intervals, and can be concentrated in areas where land use change is expected. Land use recorded data could be at a point or within a sampling unit, but could also include land use change data within a sampling unit between the sampling years.

2. LULUCF inventory compilation, according to the selected approach for each country. To estimate the land areas in each land use category for time period required, and with these values to assess which non-CO₂ gases and carbon pools are significant, and prioritise such pools in terms of methodological choice. Obtaining as result a quantification of emissions and removals. There is abundant number of methods²⁷ to get these estimation values depending on LU categories and origin of changes, but as general approximation can be interpreted like product of covered surface by each LU category $_{ij}$ and rates of gains and losses.

²⁶ Geographic Information System

²⁷ Methods documented in "IPCC Good Practice Guidance for LULUCF"

EQUATION 3.1.1
ANNUAL CARBON STOCK CHANGE IN A GIVEN POOL AS A FUNCTION OF GAINS AND LOSSES

$$\Delta C = \sum_{ijk} [A_{ijk} \bullet (C_I - C_L)_{ijk}]$$

Where:

ΔC = carbon stock change in the pool, tonnes C yr⁻¹

A = area of land, ha

ijk = corresponds to climate type i , forest type j , management practice k , etc...

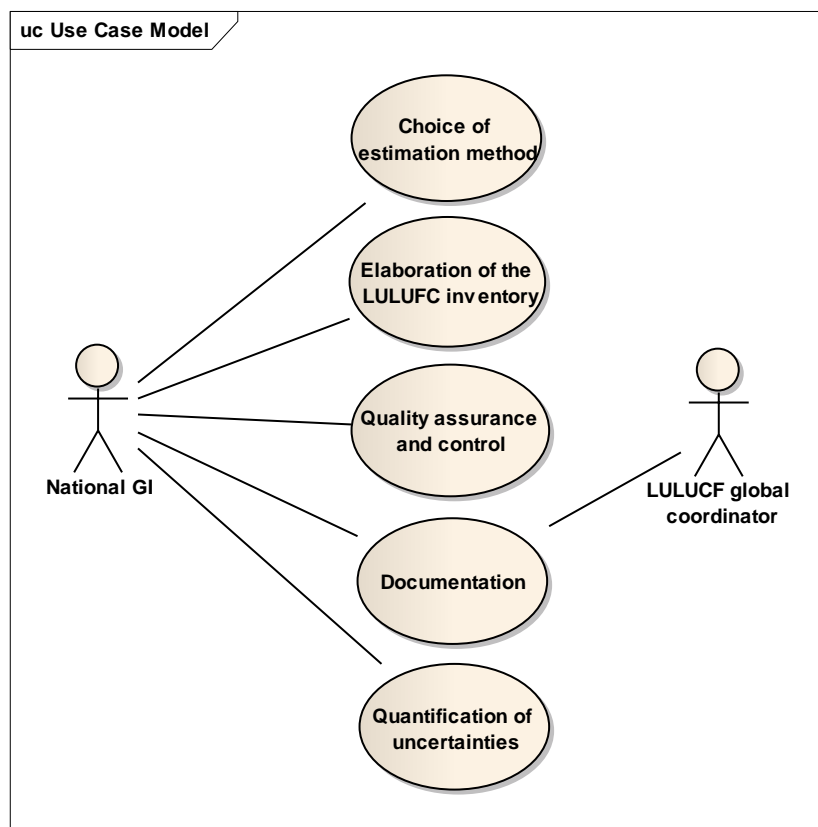
C_I = rate of gain of carbon, tonnes C ha⁻¹ yr⁻¹

C_L = rate of loss of carbon, tonnes C ha⁻¹ yr⁻¹

3. Quality assurance and quality control procedures to provide cross-checks during the inventory compilation. National inventories can have different level of precision, accuracy and levels of bias. Moreover, the estimates are influenced by the quality and consistency of data and information available in a country, as well as gaps in knowledge; the estimations can be affected by different sources of errors. It is good practice to execute quality control checks through Quality Assurance (QA) and Quality Control (QC) procedures. Agencies which collect data are responsible for reviewing the data collection methods, checking the data to ensure that they are collected and aggregated or disaggregated correctly, and cross-checking the data with other data sources and with previous years to ensure that the data are realistic, complete and consistent over time.
4. Documentation of all data and information used, archived and reported to facilitate review and assessment of inventory estimates. Elaborations on pool definition should be reported, and definitions relevant to determining the extent of the managed land included in the inventory, together with evidence that these definitions have been applied consistently over time. Documentation is also needed for demonstrating completeness, consistency of time series data and methods for interpolating between samples and methods for interpolating between samples and years, and for recalculating, and avoidance of double counting as well as for performing QA/QC. The inventory should therefore include summaries of approaches and methods used, and references to source of data such that the reported emissions estimates are transparent and steps adopted in their calculation may be retraced.
5. Quantification of uncertainties at the source or sink category level and for the inventory as a whole, so that resources available can be directed toward reducing uncertainties over time, and the improvement can be tracked.

In addition, GPG²⁸-LULUCF provides guidance related to the specific features of the LULUCF sector on consistent representation of land areas, sampling for area estimates and for estimating emissions and removals, verification, and guidance on how to complement the Convention reporting for the LULUCF sector to meet the supplementary requirements under the Kyoto Protocol.

B.5.2 Involved actors



B.5.3 Detailed description

Use Case Description	
Name	Use of LC and LU Changes data for Greenhouse Inventory Reporting obligations (UNFCCC & Kyoto Protocol)
Priority	High
Description	Employment of National and International Land Cover and Land Use Changes databases, according to the obligations of UN's FCCC and Kyoto protocol, with the objective to calculate environmental indicators. LULUCF is defined by the UN Climate Change Secretariat as "A greenhouse gas inventory sector that covers emissions and removals of greenhouse gases resulting from direct human-induced land use, land-use change and forestry activities".
Pre-condition	
Flow of Events – Basic Path	
Step 1	Choice of estimation method
Step 2	LULUCF inventory compilation
Step 3	Quality assurance and quality control procedures
Step 4	Documentation
Step 5	Quantification of uncertainties
Data source: National LC/LU databases or inventories	
Description	National Land Cover & Use, Forest, Crops Inventories; Agricultural and Forest Surveys
Data provider	Mapping Agencies, National Forest & Agriculture Institutions, NRC on Land Cover, NRC on Land Use & Spatial Planning.
Geographic scope	Global, National
Thematic scope	Land Cover, Land Use
Scale, resolution	1:100.000 to 1:10.000; MMU from 0,1 to 1 ha. No geospatial information can be also managed, if theirs statistics are addressed to admissible administrative units for LULUCF computing and the accuracy principles are assured.
Delivery	Documentation reports
Documentation	Good Practice Guidance for Land Use, Land Use Change and Forestry http://www.ipcc-nggip.iges.or.jp/public/gpplulucf/gpplulucf.html

INSPIRE	Reference: D2.8.III.4_v2.9		
TWG-LU	Data Specification on <i>Land Use</i>	2012-02-23	Page 138

B.6 Other use cases

B.6.1 Land use for environmental impact assessment

An environmental impact assessment (EIA) is an assessment of the possible impact—positive or negative—that a proposed project may have on the environment, together consisting of the natural, social and economic aspects. The International Association for Impact Assessment (IAIA) defines an environmental impact assessment as "the process of identifying, predicting, evaluating and mitigating the biophysical, social, and other relevant effects of development proposals prior to major decisions being taken and commitments made."²⁹[1]. The International Organization for Standardization (ISO) Standard 14011 covers EIA and includes key steps for carrying out the assessment. As well as direct effects, developments cause a multitude of indirect effects through consumption of goods and services, production of building materials and machinery, additional land use for activities of various manufacturing and industrial services, mining of resources etc.

B.6.2 Land use for the flood directive

The Floods Directive will be implemented by Member States at the level of River Basin districts/units of management as follows:

- Art 4-5 (Preliminary Flood Risk Assessment) – provide maps of the river basin district at the appropriate scale including the borders of the river basins, sub-basins and, where existing, coastal areas, showing topography and land use (main classes);
- Art 6 (Flood hazard and risk maps). Part of assessment and part of reporting. Maps to be produced at "the appropriate level", according previous assessment maps. Identifying: floods probability, flood extension and inhabitants affected
- Art 7 – Flood risk management plans. Land use to be taken into account. Measures could include: changed land use, spatial planning measures, set aside of lands

The floods directive requires data on the Existing Land Use relevant for identifying the stakes existing in the risks area, planned land use relevant for potential future stakes (art 4, 5 and 6) and management of risk (art 7). Flood risk management plans and maps may include zoning information but that may differ in member states. No minimum size is fixed. No European LU classification exists for the moment, and it will depend on MS national data.

Requirements include different types of economic activities (referring to NACE or national correlated equivalent codes), knowledge of areas used for flood water storage (temporarily used, permanently set aside for this purpose) and transport routes. Hydrography may include temporarily dry water courses.

For modelling purposes the complete Land Use coverage in a single layer is required (i.e. no overlaps, no gaps, no missing or duplicate polygons).

Temporal information such as the period of the land use plan is required. Land Use changes are useful information for modelling (for example to assess if there is a need to update results derived from modelling and associated risk maps etc.). In terms of degree of dependence it's important to know the actuality of features (date of last update or date its represent the reality).

There is a requirement to relate Land Use elements to potential significant flood risk areas, flooded areas, flood extent areas included in flood maps and planned flood measures.

An identifier would be helpful, for example it should enable to identify which objects from detailed Land Use datasets (provided by mapping agencies) are aggregated to/are part of or are represented by which object(s) in less detailed Land use dataset like CORINE Land cover.

²⁹ "Principle of Environmental Impact Assessment Best Practice." International Association for Impact Assessment. 1999.

INSPIRE	Reference: D2.8.III.4_v2.9		
TWG-LU	Data Specification on <i>Land Use</i>	2012-02-23	Page 139

Consistency with other themes such as Utility and Government Services, Production and Industrial Facilities, Agricultural and Aquaculture Facilities, Transport, Area management/restriction/regulation zones and reporting units should be achieved

Differentiating existing Land Use (that exists in reality) from the Planned Land Use (the one authorities are planning to develop) is required. In preliminary assessment of flood risk by determination of areas exposed to flood risk, the impact of future changes in land use in regional scale is taken into consideration in order to evaluate the potential increase/decrease of flood risk.

On flood hazard maps 8 categories of land use elements may be defined: “residential, industrial, communication, forests, parks and recreation, agricultural, water bodies, other”. Two additional categories are required : buildings and address points.

The most wanted attribute is the number of people on specific area.

B.6.3 Statistics for land use

Regulation (EC) No 223/2009 of the European Parliament and of the Council of 11 March 2009 on European statistics constitutes the legal basis for the preparation of the European statistical programme, providing the framework for the development, production and dissemination of European statistics, the main fields and the objectives of the actions envisaged for a period not exceeding five years. The current programme covers the period 2008-2012. It was established by the Council Decision 1578/2007/EC of 11 December 2007. The five-year programmes are backed up by annual programmes that set more detailed objectives for each year. The following actors are involved: Eurostat (the Statistical Office of the European Commission), (Data provider, data co-ordinator, data user), DG Environment (Data user), DG Agriculture (Data User), DG Enterprise (Data user), European Environment Agency (Data user), Other European Commission services (Data user).

Eurostat collects land cover/use data mainly through the LUCAS survey, which is directly implemented by Eurostat. LUCAS stands for Land Use and Cover Area frame Survey. The aim of the LUCAS survey is to gather harmonised data on land use/cover in the EU countries. In addition the survey provides in-situ information facilitating the analysis of the interactions between land, environment and human activities. In the 2008/2009 LUCAS survey 265,000 geo-referenced points were visited by more than 500 field surveyors on the spot. The points were selected from a standard 2 km grid including in total around 1 million points all over the EU. Land cover and use data is collected from each point according to the LUCAS nomenclature, which consists of a separate land cover nomenclature and of a separate land use nomenclature. In addition the LUCAS database contains approximately 1 million landscape photos and data on agro-environmental features. The final database consists of all surveyed variables on all points. Harmonised land cover and land use statistics are based on this dataset. The data and results are published on Eurostat website and widely used by many Commission services. Eurostat also attempts to collect land cover/use data directly from the Member States. Due to different definitions, classification systems and nomenclatures in the 27 EU Member States this requires a lot of preparatory work in the field of definition and data harmonisation. This is the area where Eurostat will work intensively in the future.

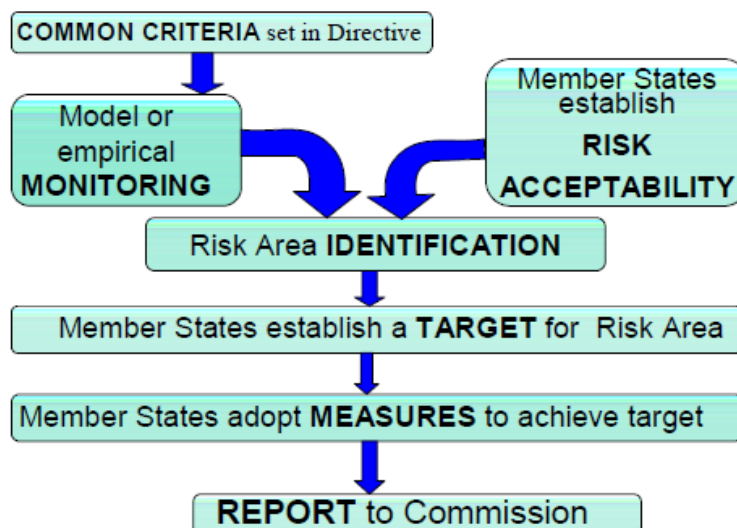
B.6.4 Land use for soil management

Soil is defined as the top layer of the earth's crust. It is formed by mineral particles, organic matter, water, air and living organisms. It is in fact an extremely complex, variable and living medium. The interface between the earth, the air and the water, soil is a non-renewable resource which performs many vital functions: food and other biomass production, storage, filtration and transformation of many substances including water, carbon, nitrogen. Soil has a role as a habitat and gene pool, serves as a platform for human activities, landscape and heritage and acts as a provider of raw materials. These functions are worthy of protection because of their socio-economic as well as environmental importance.

Erosion, loss of organic matter, compaction, salinisation, landslides, contamination, sealing... Soil degradation is accelerating, with negative effects on human health, natural ecosystems and climate

change, as well as on our economy. At the moment, only nine EU Member States have specific legislation on soil protection (especially on contamination).

The Commission adopted a Soil Thematic Strategy (COM(2006) 231) and a proposal for a Soil Framework Directive (COM(2006) 232) on 22 September 2006 with the objective to protect soils across the EU. The Strategy and the proposal have been sent to the other European Institutions for the further steps in the decision-making process. The proposed Directive will require Member States to identify risk areas on the basis of common elements to be taken into account, set risk reduction targets for those areas and establish programmes of measures to achieve them.



On the basis of a common definition of contaminated sites (i.e. sites which pose significant risk to human health and the environment), its application by the Member States, and a common list of potentially polluting activities, Member States will be required by the proposed directive to identify the contaminated sites on their territory and establish a national remediation strategy. In order to achieve a more rational use of soil, Member States will be required to take appropriate measures to limit sealing by rehabilitating brownfield sites and to mitigate its effects by using construction techniques that allow maintaining as many soil functions as possible.

Despite the efforts of several Presidencies, the Council has so far been unable to reach a qualified majority on this legislative proposal due to the opposition of a number of Member States constituting a blocking minority. In general terms, a majority of delegations support a Framework Directive on soil protection. They hold the view that it is needed in order to fill a gap in Union environmental legislation and to provide a more holistic approach to soil protection. This view is also upheld by the Commission. Several delegations, however, remain highly critical of the proposed Directive. These delegations oppose the proposal on grounds of the subsidiarity and proportionality principles, expected costs and administrative burden. Furthermore, they question its added-value in relation to existing Union law.

As far as land use is concerned, erosion, sealing and contaminated sites determination may require knowledge of the Existing Land Use at different time period

B.7 Existing land use data requirements

The first step while designing data specifications or products is to identify the final users and their real requirements and needs. These should act as rules during the design phase because they will guarantee the final result usefulness.

The following chapter provides a set of requirements as derived from the INSPIRE users' information collection enriched with experiences gathered in the requirements repository of the ICT PSP HLANDATA project, from a modelling and data specification redaction point of view.

INSPIRE	Reference: D2.8.III.4_v2.9		
TWG-LU	Data Specification on <i>Land Use</i>	2012-02-23	Page 141

The main objective of the HLANDATA project was to demonstrate the feasibility of a European level harmonization of Land Use and Land Cover datasets taking into account both the data categorization and the data models, for any of their possible uses and users, through the development of user oriented value-added services. After the evaluation and comparison of users' information from HLANDATA project and INSPIRE, the results affirm that both initiatives share a similar users understanding and framework. HLANDATA users' requirements involve tasks carried out in the documented INSPIRE uses cases. This last section deals with HLANDATA requirements' collection and offers more detailed results about real users' preferences.

B.7.1 Features

Most of the use cases require a complete coverage of the area of interest with information regarding the use of land. The concept of dominant land use for each piece of land is acceptable although it may be often required to have information on other possible land uses. It is often required to identify the land use components over a user-defined area which has no connection to the limits of homogeneous land use area.

The intensity of use is also very important for many use cases in order to evaluate the human pressure on the environment (i.e. residential human density, intensity of crops production, etc.).

About scopes covered by data demanded by users, there is a preference for natural areas potentially regulated by environmental plans or risk zones, such as wetlands, waters or river shores.

Land use and Land cover are nonetheless concepts on which the use cases have difficulties to differentiate. It comes from the actual databases where both concepts are mixed. INSPIRE Land Cover and Land Use data specification must reflect the independence between land use and land cover, but must not impose new data production.

Level of detail or minimum mapping unit (mmu) in existing land use data sets plays a crucial element for the data usability. Users choose or reject information based on it. After analysis it have been extracted that this factor also is related with the typology of user. Organizations with National territory competence requires data at around 1:25.000 scale (mmu 2ha), meanwhile Regional or Local institutions prefer more accurate data at around 1:5.000 scale (mmu 0.5ha).

For modelling purposes the complete land use coverage in a single layer is required (i.e. no overlaps, no gaps, no missing or duplicate polygons).

There is a requirement to relate land use elements to other geographical objects that are visible in the reality but it is seldom required to implement geometric relationships with these objects.

B.7.2 Nomenclature

No commonly agreed nomenclature has been identified during the use case analysis. Nonetheless there is a practical agreement to use a multi-level hierarchical nomenclature separating the land use from land cover. There is a requirement to refer to different types of economic activities (referring to NACE or national correlated equivalent codes).

Alternative modelling taking account more than one presence of land use category per piece of land (object oriented philosophy) is considered complex as a unique harmonization methodology.

B.7.3 Temporal dimension

Temporal information is often quoted as an important issue to be dealt with. Comparing the existing land use through time is important and raises the issue of solving inconsistencies between the respective geometries of LU data sets over the same area but at different dates (how to deal with slivers?). It has been thought that the issue needs to be solved either at the producer level (e.g. in providing existing land use datasets based on a stable geometric delineation of polygons) or at the user level in his information system (e.g. in considering the respective positional accuracy of the datasets).

INSPIRE	Reference: D2.8.III.4_v2.9		
TWG-LU	Data Specification on <i>Land Use</i>	2012-02-23	Page 142

A dataset providing only changes in land use between two dates has not been required by the analyzed use cases.

After a review of required update frequency, most of the users asked for a high updating frequency for land use databases because currently there are many land inventories that undertake yearly updates.

B.7.4 Quality control

It has been recognised that the issue needs to be solved either at the producer level (e.g. in providing existing land use datasets based on a stable geometric delineation of polygons) or at the user level in his information system (e.g. in considering the respective positional accuracy of the datasets

B.7.5 Identifiers

Identifiers would be helpful, for example they should enable to identify which objects from detailed Land Use datasets are aggregated to/are part of or are represented by which object(s) in less detailed Land Use dataset like CORINE Land Cover.

B.7.6 Portrayal

A consistent portrayal for Existing Land Use is often quoted as useful in case of visualisation of adjacent datasets provided by different producers, preferably based on a harmonized land use nomenclature for the entire Europe..

B.7.7 Metadata

Normal metadata are required such as who produced the data set, when and for what purpose, date of recording (remote sensing data) respectively date of data collection (surveying and mapping), etc. Metadata at feature level might be useful but it has been thought difficult to implement it in the proposed data specification.

In terms of degree of dependence it's important to know the actuality of features (date of last update or date representing the reality).

B.7.8 Consistency with other themes

The consistency with other INSPIRE themes such as land cover, Utility and Government Services, Production and Industrial Facilities, Agricultural and Aquaculture Facilities, Transport, Area management/restriction/regulation zones and reporting units is important. But it seems that the models should not implement relationships between existing land use polygons and the geographical objects of other themes as the link can be computed using the geometry. Also the same geometry from National databases can serve to several INSPIRE data themes, for example a polygon in a National LC/LU database could be used for both INSPIRE themes.

B.7.9 Detailed user's assessment from HLANDATA project

The first step of the HLANDATA project dealt with the assessment of the current European situation regarding the harmonization of the Land Cover and Land Use data. An assessment of the end users and their needs from the point of view of data harmonization was carried out ³⁰. In detail users' assessment report includes the catalogue of user requirements, involving information recompilation about: general and basic information about the user (i.e competence area, thematic ambit, legal frame, typology, etc.); current used databases and aspects related with acquisition, utilization, satisfaction or dissemination of data; current used webservices, distinguishing between type and frequency of service; and a detailed list of needed data.

³⁰ Deliverables of Work Package 1 (Diagnostic of users and databases) at <http://www.hlandata.eu/>

All project partners were requested to be involved in the collection through their particular knowledge of users and used databases in their countries. To obtain this information, a set of questionnaires were elaborated in order to gather all the information needed to carry out the LC/LU users assessments. Each questionnaire was filled by each partner as they were the only ones aware of the inside of the project. Due to the characteristics and level of detail of the forms, they had to be completed in close communication with involved users, via meeting or via telephone. All partners collaborated with questionnaires, so a global European overview was reached from national study evaluations, following bottom-up dimensioning.

As a summary of Requirements Inventory some key comments are given in the following. Analysed organizations can demand more than one requirement; especially there are organizations with 5-8 items and others with only 1 or 2, to reach a total of 216 needs. A better way to understand each concrete interest is to review numeric reports over filled questionnaires, and an overview on themes, frequency of update, scales or minimum mapping unit can be done to extract general considerations.

In a general view, Environmental lands predominate, 23 Wetlands (10,65%) and 23 Forests (10,65%); together with 20 Settlements (9,26%). The frequency for update required for users of 1 year (107, i.e. 49,54%). Concerning geometric aspects, the demanded scale is 1:25.000 for 113 cases (52,31%) and the minimum polygon size is 1 ha (89 i.e. 41,2%), vector information is the most commonly used (118 i.e. 54,63%) and shapefile the preferred format (106 i.e. 49,07%). Regarding land categories needed for the users in the catalogue the main groups of land type, which are mostly required, are given in the following table:

Land Theme	Users requiring	Update frequency (years)	Scale	MMU
Forest / Unique trees / Vegetation / Riverbank formation / others	13 / 1 / 1 / 2 ; and more	1 to 5, but mostly 1	1.25.000 (mostly) to 1:5.000	0,1 to 2,5 ha
Waters / Rivers / Hydrography resources / Water treatment plants / Hydrography / others	10 / 1 / 1 / 1 / 2 ; and more	1 to 5, but mostly 1	1.25.000 (mostly) to 1:5.000	2 to 0,5 ha
Settlements / Urban areas/ Artificial areas / others	9 / 3 / 6 ; and more	1 to 5, but mostly 1	1.25.000 (mostly) to 1:5.000	2 to 0,5 ha
Croplands / Agricultural areas / Irrigated crops / others	9 / 5 / 4 ; and more	1 to 5, but mostly 1	1.25.000 (mostly) to 1:5.000	2 (mostly) to 0,5 ha
Grasslands / others	8	1 year	1.25.000 (mostly) to 1:5.000	2 to 0,5 ha
Natural areas / others	3	2 to 5	1.25.000	2 ha

Table of required land information by users

B.8 Planned land use data requirements

B.8.1 Features

The use case implies to have access to the zoning elements and the areas where supplementary regulation that are present in spatial plans, as well as a graphic map that indicates on which area the plan is applied and the textual planning requirements. Geometric delimitation of zoning elements and supplementary regulation is given by spatial plan requirements, not by mapping rules.

When converted into a vector format, the requirements include the following layers:

- A geometrically accurate polygon layer with polygons that are collectively exhaustive and mutually exclusive (over the area that is mapped), provides the information on zoning. Each

INSPIRE	Reference: D2.8.III.4_v2.9		
TWG-LU	Data Specification on <i>Land Use</i>	2012-02-23	Page 144

polygon has an attribute which refers to the text of the zoning regulation. A direct link to the pdf-file may be available.

- A geometrically accurate polygon layer, with possible overlapping geometry provides information on restrictions that affect land areas. Each polygon has an attribute which refers to the text of the constraint regulation. A direct link to the pdf-file may be required
- A geometrically **not** accurate polygon layer provides complementary information on projected areas
- A geometrically accurate line layer provides information on existing line infrastructure such as roads, railways
- A geometrically **not** accurate line layer provides information on projected line infrastructure with its exact position being not yet known
- A geometrically accurate point layer
- A geometrically **not** accurate point layer
- A polygon layer with the contour of the whole plan
- A polygon layer with the contour of parts of the plan

In most of the European countries old plans are not always converted into polygon features. These plans are however (or most of them) required as a geo-referenced raster image.

Information on the step reached by the spatial planning process is often required, e.g. when a new plan has been ratified by the appropriate authority, when a plan has replaced another or when updates due to other reasons need to take place, or if a new plan is under preparation, scrutiny or approval.

B.8.2 Nomenclature

Some European countries have their national nomenclature for Planned Land Use, but for many of them, the nomenclature is standardised at the regional or municipal level. Examples of nomenclatures are provided in annex C.

B.8.3 Temporal dimension

Temporal information is often required. Land predestinations and post destinations can be allocated to land portion, that is why overlapping polygons are required

B.8.4 Identifiers

A general unique code for each article of the textual regulation is requested, enabling to assign with no ambiguity which regulation apply on which polygon of the zoning. Identifiers for each polygon are not necessary.

B.8.5 Quality control

Stable geometric delimitation should be guaranteed in the spatial plan definition by competent planer administration.

B.8.6 Portrayal

A non geo-referenced legend file (tiff or pdf) must be exchanged for each plan, which enumerates all the used symbols on the plan and their title. For getting more detailed information on the meaning of the symbol set the textual part itself has to be consulted.

INSPIRE	Reference: D2.8.III.4_v2.9		
TWG-LU	Data Specification on <i>Land Use</i>	2012-02-23	Page 145

B.8.7 Metadata

Each individual plan must have a metadata fiche. This gives information about the contents, origins, projection system and quality.

B.8.8 Consistency with other themes

In case expropriation of owners of certain parcels, the exact parcel number and address is required. Other rules and regulations that apply to that zone need to be considered with the zoning plan (Area management/restriction/regulation zones and reporting units)

INSPIRE	Reference: D2.8.III.4_v2.9		
TWG-LU	Data Specification on <i>Land Use</i>	2012-02-23	Page 146

Annex C (informative) Towards the Hierarchical INSPIRE Land Use nomenclature

In order to determine the nomenclature that should be used in the data specifications of the INSPIRE theme land use several existing nomenclatures have been reviewed to evaluate if it is possible to adopt one of these existing nomenclatures or whether it is necessary to make a new one. The difficulty in composing a nomenclature for land use is the fact that the INSPIRE theme deals with two different views on land use; one deals with the existing land use including from a statistical point of view, while the other deals with the future land use from a planners point of view. This means that besides deciding which nomenclature should be used; there is also a decision about whether or not the same nomenclature for both types of land use should be adopted.

The list of nomenclatures below is not meant to be exhaustive. The choice of investigated nomenclatures is solely based on the fact that these nomenclatures were known by the members of the TWG or provided as reference material. For each classification system the main categories are mentioned to enable comparison.

C.1 Investigated classification systems

A.1.1 ISIC Rev.3 (*International Standard Classification of All Economic Activities*)

The ISIC classification was drawn up by the United Nations (approved by the Statistical Commission in 1989) and recommended for use throughout the world. The ISIC is intended to be a standard classification of productive economic activities. This classification is integrated in the sense that it ensures a full harmonization with another main branch of economic classifications: the classifications of products (ICPC Central Product Classification) which are fundamental for foreign trade statistics, statistics of production and consumption, energy statistics, etc. The ISIC classification may therefore be appropriate to characterise land use percentages for administrative units. The ISIC Rev. 3, is fully compatible with the EU NACE Rev. 1 (Nomenclature des Activités de la Communauté Européenne) system for the first two levels. (System replaced by 1.1.2008, see references). The ISIC Rev.3 uses 4 levels of classification: 17 sections, which are further divided into 62 divisions. The third level consists of groups, while the fourth level is further divided into classes.

The ISIC system is however not in use within the spatial planners community mainly because it does not provide entries for “residential area”, “recreation areas”, “mix residential-activity area” that are common in spatial planning documents.

- SECTION A Agriculture, Hunting and Forestry
- SECTION B Fishing
- SECTION C Mining and Quarrying
- SECTION D Manufacturing
- SECTION E Electricity, Gas and Water Supply
- SECTION F Construction
- SECTION G Wholesale and Retail Trade, Repair of motor vehicles, motorcycles and Personal and household goods
- SECTION H Hotels and Restaurants
- SECTION I Transport, Storage and Communication
- SECTION J Financial intermediation
- SECTION K Real estate, Renting and Business activities
- SECTION L Public Administration and Defence, Compulsory social security
- SECTION M Education
- SECTION N Health and Social work
- SECTION O Other Community, Social and Personal Service Activities
- SECTION P Private Households with Employed Persons
- SECTION Q Extra-territorial Organizations and Bodies

INSPIRE	Reference: D2.8.III.4_v2.9		
TWG-LU	Data Specification on <i>Land Use</i>	2012-02-23	Page 147

C.1.1 LUCAS (Land Use / Cover Area Frame Survey)

The LUCAS nomenclature used to be applied for surveys focused on agriculture. Since 2008 the scope has been enlarged to land cover/use in general. The main aim of the LUCAS survey is to gather harmonised information on land use/cover and their changes over time. In addition the survey provides territorial information facilitating the analysis of the interactions between agriculture, environment and countryside. The LUCAS nomenclature has separate classification systems for land cover and land use. Land cover is defined as the physical cover of the earth's surface and land use is the socio-economic function of the land.. Land use has 15 main categories. It has altogether 34 classes, which are indicated by the combination of the letter "U" and three digits. The same nomenclature is applied in all EU countries in the LUCAS survey. It also allows comparisons in time (since LUCAS 2006 survey). It is as much as possible compatible with the existing land cover/use systems (e.g. FAO, NACE and Farm Structure Survey).

The LUCAS classification is used for statistical purposes and is therefore more difficult to adopt for planned land use. The biggest problem seems to be the lack of mixed land uses.

- U110 AGRICULTURE
- U120 FORESTRY
- U130 FISHING
- U140 MINING AND QUARRYING
- U210 ENERGY PRODUCTION
- U220 INDUSTRY AND MANUFACTURING
- U310 TRANSPORT, COMMUNICATION NETWORKS, STORAGE, PROTECTIVE WORKS
- U320 WATER AND WASTE TREATMENT
- U330 CONSTRUCTION
- U340 COMMERCE, FINANCE, BUSINESS
- U350 COMMUNITY SERVICES
- U360 RECREATION, LEISURE, SPORT
- U370 RESIDENTIAL
- U400 UNUSED

C.1.2 Urban Atlas

The Urban Atlas is providing pan-European comparable land use and land cover data for Large Urban Zones with more than 100.000 inhabitants as defined by the Urban Audit. The GIS data can be downloaded together with a map for each urban area covered and a report with the metadata.

Earth observation data are the basis for interpretation. Topographic maps in digital form with precise geo-coding are used for interpretation of objects. Application of automatic classification routines, as segmentation and clustering are applied whenever appropriate: Automated segmentation and classification to achieve a first differentiation into basic land cover/land use classes (urban vs. forest vs. water vs. other land cover/land use).

The Urban Atlas nomenclature mixes land use classes with land cover classes. It has a hierarchical nature.

- 1 Artificial surfaces
 - 1.1 Urban fabric
 - 1.1.1 Continuous Urban fabric (soil sealing >80%)
 - 1.1.2 Discontinuous urban fabric
 - 1.1.2.1 Discontinuous dense urban fabric (soil sealing 50% - 80%)
 - 1.1.2.2 Discontinuous medium urban fabric (soil sealing 30% - 50%)
 - 1.1.2.3 Discontinuous low urban fabric (soil sealing 10% - 30%)
 - 1.1.2.4 Discontinuous very low urban fabric (soil sealing <10%)
 - 1.1.3 Isolated structure
 - 1.2 Industrial, commercial, public, military, private and transports units
 - 1.2.1 Industrial, commercial, public, military, private units

INSPIRE	Reference: D2.8.III.4_v2.9		
TWG-LU	Data Specification on <i>Land Use</i>	2012-02-23	Page 148

- 1.2.2 Road and rail network and associated units
 - 1.2.2.1 Fast transit roads and associated land
 - 1.2.2.2 Other roads and associated land
 - 1.2.2.3 Railways and associated land
- 1.2.3 Port areas
- 1.2.4 Airports
- 1.3 Mine, dumps and construction sites
 - 1.3.1 Mineral extraction and dump sites
 - 1.3.3 Construction sites
 - 1.3.4 Land without current use
- 1.4 Artificial non-agricultural vegetated areas
 - 1.4.1 Green urban areas
 - 1.4.2 Sport and leisure facilities
- 2 Agricultural areas, semi-natural areas and wetlands
- 3 Forests
- 4 Water

C.1.3 Plan4All

Plan4all is a European project co-funded by the Community programme *eContentplus*. The main aim of the project is to harmonise spatial planning data and related metadata according to the INSPIRE principles. The aim of work package 4 is to define data models for several INSPIRE themes including land use. First of all they have compared several different models from different countries. The second step was to make an overall data model including classifications. The data model for land use uses four different classifications: 'LUCAS', 'MacroClassificationOfLand', 'GeneralLandUseType' and 'SpecificLandUseType'. 'LUCAS' uses the LUCAS classification, and the 'specific land use type' uses the classification used in each country/region. This classification should (if used) be uploaded into the model.

The Plan4all model is based on land use from a planner's point of view, so it is less useful for the existing land use. Besides this it is also a complicated model with a lot of detailing.

Macroclassification:

- Urbanised
- ToBeUrbanised
- Rural
- Natural
- Other

GeneralLandUseType:

- Residential
- IndustrialCommercial
- ServicesOfGeneralInterest
- Green
- AreasOfNaturalInterest
- Agriculture
- Water
- RoadTrafficInfrastructure
- RailwayTrafficInfrastructure
- OtherTrafficInfrastructure
- SpecialDevelopmentZone
- Mining
- Quarrying
- TechnicalInfrastructure
- Other

C.1.4 FR-CNIG – Plan local d'urbanisme – Plan d'occupation des sols

INSPIRE	Reference: D2.8.III.4_v2.9		
TWG-LU	Data Specification on <i>Land Use</i>	2012-02-23	Page 149

The standard aims at defining a standard way of converting spatial planning documents at the parcel level into a digital form. It defines a nomenclature of planned land use that is applicable by all local governments. A first version was finalised in 2006 and updated in 2010. The approach is significantly different to the approaches such as LBCS, NLUD or LUCAS as it provides a nomenclature for planned land use.

Two levels are defined:

- a “simplified zone type” with only 5 main classes (built-up area, to be built-up area (divided into two sub-classes), agriculture area, natural area, natural area that can be built-up (divided into two sub-classes))
- the dominant vocation of the area divided into 11 classes (not applicable, residential, activity, residential/activity mix, leisure and tourism, amenities, agriculture activity, natural space, remarkable space, quarrying, other)

The standard also provides a nomenclature for prescriptions that are superimposed on land-use area providing supplementary regulations on the possibility to change land-use. 25 categories are provided (e.g. classified woodland, sector with provision of reconstruction / demolition, specific limitation for building implementation, placeholder, area with development guidelines, etc.)

C.1.5 NL-BBG – Bestand Bodemgebruik

Since the 1940's the statistics department of The Netherlands is periodically compiling an overview of the land use in The Netherlands. The geometry is based on the topographical map. The functional classification is made up out of two levels.

The classification seems to be quite generic, grouping residential areas, service oriented areas and industry into one category of built-up area. BBG also gives great attention to the main class of water.

- 1 Transport
- 2 Built-up area
- 3 Semi built-up area
- 4 Recreation
- 5 Agriculture
- 6 Woodland and nature
- 7 Inland water
- 8 Tidal waters
- 9 Foreign countries

C.1.6 UK-National Land Use Database: Land Use and Land Cover Classification

The NLUD classification is intended to provide in the United Kingdom a framework for harmonising existing classifications, to facilitate consistent collection and reporting of land use and land cover information, and to provide the basis for the creation of national data sets. It has been designed to serve as a standard classification available for adoption by bodies involved in the routine collection of land use and land cover data. NLUD definition of Land use: "land use relates to the activity or socio-economic function for which land is used". An interesting aspect that is mentioned is 'mixing' or 'different combination of classes', which is divided into three different types: two dimensional (juxtaposition), three dimensional (superposition) and temporal. That implies a more complicated data model, may be using an object oriented data model, to assign different classes to polygons or parcels. This nomenclature uses a two-tier approach with the possibility to add third level tiers at local level.

This approach is similar to the LUCAS classification. It is also mainly used for statistical purposes and is therefore more difficult to adopt for planned land use. The biggest problem seems to be the lack of mixed land uses.

- U010 U110 AGRICULTURE
- U120 FORESTRY
- U130 AQUACULTURE AND FISHING

INSPIRE	Reference: D2.8.III.4_v2.9		
TWG-LU	Data Specification on <i>Land Use</i>	2012-02-23	Page 150

U140 MINING AND QUARRYING
 U210 ENERGY PRODUCTION
 U220 INDUSTRY AND MANUFACTURING
 U310 TRANSPORT, COMMUNICATION NETWORKS, STORAGE, PROTECTIVE WORKS
 U320 WATER AND WASTE TREATMENT
 U330 CONSTRUCTION
 U340 COMMERCE, FINANCE, BUSINESS
 U350 COMMUNITY SERVICES
 U360 RECREATION, LEISURE, SPORT
 U370 RESIDENTIAL
 U400 UNUSED AND ABANDONED AREAS

C.1.7 US-LBCS (Land-Based Classification Standards)

In 1994, the American Planning Association (APA) reported on the findings of a survey of federal, state, regional, and local needs for an updated land-use classification standard in USA. Then, in May 1996, APA, along with the participation of six other federal agencies, initiated the Land-Based Classification Standards (LBCS) project. Through this project, APA and its partners produced a new land classification system to allow jurisdictions, agencies, and institutions at the local, regional, state, and national level to share land-based data. The first version of LBCS was released in 2000, and the standards have been updated periodically in the intervening years. The model extends the notion of classifying land uses by refining traditional categories into multiple dimensions. The 5 dimensions are: activity, function, structure, site and ownership. Each dimension has its own set of categories and subcategories, giving in total the possibility to use up to 4 levels of detail. These multiple dimensions allow users to have precise control over land use classifications

LBCS is an interesting model for land use classification. Because of the different dimensions a very detailed and accurate picture of the actual land use can be made. This provides the advantage of flexibility (one of the recommendations in D2.6) for the Member States to adapt to the data specifications. They will then have the choice which (combination) of dimensions they want to use or are compliant to their own data model. The dimension 'function' would be the most important (and maybe also most easy) to use because it is more similar to nomenclatures used by land use planners and also similar to the nomenclatures of LUCAS. It could therefore be an option to make this dimension mandatory and the other ones optional. On the other side of the coin, INSPIRE implementation rules should be careful in providing models that are too detailed or too complex to implement for the member states. As no new data will be collected by the Member States to be compliant with the data specifications, it is assumed that existing data will be transformed to the general model. LBCS model is a bit confusing and not simple in use.

Overall there is too much detail and the whole system is too complex.

1000 Residence or accommodation function
 2000 General sales or services
 3000 Manufacturing and wholesale trade
 4000 Transportation, communication, information and utilities
 5000 Arts, entertainment and recreation
 6000 Education, public administration, health care and other institution
 7000 Construction-related business
 8000 Mining and extraction establishments
 9000 Agriculture, forestry, fishing and hunting

C.2 Conclusions

For the INSPIRE Land Use theme it is desirable to work with one nomenclature for both the existing and the planned land use. For this reason it has been chosen to start from the LUCAS nomenclature, since this is the most widely spread used nomenclature and other classifications can be matched to the LUCAS classes. The Plan4All workgroup has also advised in its data model the use of LUCAS as one of the classifications. As stated above however there remains the difficulty of mixed zones for

INSPIRE	Reference: D2.8.III.4_v2.9		
TWG-LU	Data Specification on <i>Land Use</i>	2012-02-23	Page 151

planned land use. This problem could be avoided if new classes would be added to the LUCAS nomenclature for the use in the INSPIRE land use theme. The TWG advises to adopt a hierarchical land use classification system for INSPIRE. It is further developed from the LUCAS classification and clearly more hierarchical.

The advantage of using the same nomenclature for both the existing and planned land use would be that it is possible to make comparisons between different years and between present and future. This comparison between existing and planned land use is not to be confused with temporal dimension: planned is the expected or foreseen land use (to be built), while existing is the real land use (past or present). The planned land use may not always become the existing land use, plans may not be executed or illegal activities may occur. The temporal dimension is used in the existing land use as time stamps for each data set. It will have versioning, change control and evolutions, used for study of temporal attributes with a unique identifier for polygons. An example of this is the CORINE 90-00-06 land cover.

For Land Cover, a density of buildings/trees is a physical characteristic, For Land use density refers to the intensity of activities (agriculture, farming, manufacturing, services...)

As a general guide, the identification and recording of land use should be at the smallest spatial unit that resources will permit. This provides the greatest flexibility and ability to aggregate to larger spatial units if required by other applications. Therefore the "minimum unit of interest" shall be documented.

C.3 HILUCS

The HILUCS code list is provided in section 5.2.7.1

C.4 Mapping HILUCS with LUCAS, NACE, SEEA and Urban Atlas

This section shows through examples how to map HILUCS with a specific classification system. LUCAS, NACE and Urban Atlas have been selected because they are European. The SYSTEM OF ENVIRONMENTAL-ECONOMIC ACCOUNTS (SEEA) has been selected as it has been prepared under the auspices of the United Nations Committee of Experts on Environmental-Economic Accounting

<i>LUCAS code and definition</i>		<i>HILUCS code</i>
U111	Agriculture (excluding fallow land, kitchen garden and personal consumption areas)	1.1
U112	Fallow land and abonded land in agriculture	1.1
U113	Kitchen garden	1.1
U120	Forestry	1.2
U130	Fishing	1.4
U140	Mining and Quarrying	1.3
U210	Energy Production	2.4
U221	Manufacturing of food, beverages and tobacco products	2.3.1
U222	Manufacturing of textile products	2.1.1 and 2.3.2
U223	Coal, oil and metal processing	2.1.4 and 2.1.6
U224	Production of non-metal mineral goods	2.1.7
U225	Chemical and allied industries and manufacturing	2.1.5
U226	Machinery and equipment	2.2.1 and 2.2.2
U227	Wood based products	2.1.2 and 2.1.3
U311	Railways	4.1.2
U312	Roads	4.1.1
U313	Water transport	4.1.4
U314	Air transport	4.1.3
U315	Transport via pipelines	4.3.1
U316	Telecommunication	3.2.3

INSPIRE	Reference: D2.8.III.4_v2.9		
TWG-LU	Data Specification on <i>Land Use</i>	2012-02-23	Page 152

U317	Storage	4.2
U318	Protection infrastructure	4.3.4
U321	Water supply and treatment	4.3.2
U322	Waste treatment	4.3.3
U330	Construction	6.1
U340	Commerce, Finance, Business	3.1 and 3.2
U350	Community services	3.3
U361	Amenities, museums, leisure	3.4
U362	Sport	3.4
U363	Holiday camps	3.1.3 and 5.3
U364	Nature reserves	Supplementary regulation
U370	Residential	5.1
U400	Unused	6.3

<i>NACE (Level2) code and definition</i>		<i>HILUCS code</i>
A	Agriculture, forestry and fishing	
A1	Crop and animal production, hunting and related service activities	1.1 & 1.5.1
A2	Forestry and logging	1.2
A3	Fishing and aquaculture	1.4
B	Mining and quarrying	
B5	Mining of coal and lignite	1.3.1
B6	Extraction of crude petroleum and natural gas	1.3.1
B7	Mining of metal ores	1.3.2
B8	Other mining and quarrying	1.3.3
B9	Mining support service activities	1.3.3
C	Manufacturing	
C10	Manufacture of food products	2.3.1
C11	Manufacture of beverages	2.3.1
C12	Manufacture of tobacco products	2.3.1
C13	Manufacture of textiles	2.1.1
C14	Manufacture of wearing apparel	2.3.2
C15	Manufacture of leather and related products	2.3.2
C16	Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials	2.1.2
C17	Manufacture of paper and paper products	2.1.2
C18	Printing and reproduction of recorded media	2.3.3
C19	Manufacture of coke and refined petroleum products	2.1.4
C20	Manufacture of chemicals and chemical products	2.1.5
C21	Manufacture of basic pharmaceutical products and pharmaceutical preparations	2.3.5
C22	Manufacture of rubber and plastic products	2.1.8
C23	Manufacture of other non-metallic mineral products	2.1.7
C24	Manufacture of basic metals	2.1.6
C25	Manufacture of fabricated metal products, except machinery and equipment	2.1.6
C26	Manufacture of computer, electronic and optical products	2.3.4
C27	Manufacture of electrical equipment	2.3.4
C28	Manufacture of machinery and equipment	2.2.1
C29	Manufacture of motor vehicles, trailers and semi-trailers	2.2.2
C30	Manufacture of other transport equipment	2.2.2
C31	Manufacture of furniture	2.3.5
C32	Other manufacturing	2.1.9, 2.2.3, 2.3.5
C33	Repair and installation of machinery and equipment	3.1.1
D	Electricity, gas, steam and air conditioning supply	
D35	Electricity, gas, steam and air conditioning supply	2.4
E	Water supply; sewerage; waste management and remediation activities	

INSPIRE	Reference: D2.8.III.4_v2.9		
TWG-LU	Data Specification on <i>Land Use</i>	2012-02-23	Page 153

E36	Water collection, treatment and supply	4.3.2
E37	Sewerage	4.3.2
E38	Waste collection, treatment and disposal activities; materials recovery	4.3.3
E39	Remediation activities and other waste management services	4.3.3
F	Construction	
F41	Construction of buildings	6.1
F42	Civil engineering	6.1
F43	Specialised construction activities	6.1
G	Wholesale and retail trade; repair of motor vehicles and motorcycles	
G45	Wholesale and retail trade and repair of motor vehicles and motorcycles	3.1.1
G46	Wholesale trade, except of motor vehicles and motorcycles	3.1.1
G47	Retail trade, except of motor vehicles and motorcycles	3.1.1
H	Transporting and storage	
H49	Land transport and transport via pipelines	4.1.1 & 4.1.2
H50	Water transport	4.1.4
H51	Air transport	4.1.3
H52	Warehousing and support activities for transportation	4.2
H53	Postal and courier activities	3.2.3
I	Accommodation and food service activities	
I55	Accommodation	3.1.3
I56	Food and beverage service activities	3.1.3
J	Information and communication	
J58	Publishing activities	3.2.3
J59	Motion picture, video and television programme production, sound recording and music publishing activities	3.2.3
J60	Programming and broadcasting activities	3.2.3
J61	Telecommunications	3.2.3
J62	Computer programming, consultancy and related activities	3.2.3
J63	Information service activities	3.2.3
K	Financial and insurance activities	
K64	Financial service activities, except insurance and pension funding	3.2.1
K65	Insurance, reinsurance and pension funding, except compulsory social security	3.2.1
K66	Activities auxiliary to financial services and insurance activities	3.2.1
L	Real estate activities	
L68	Real estate activities	3.1.2
M	Professional, scientific and technical activities	
M69	Legal and accounting activities	3.2.2
M70	Activities of head offices; management consultancy activities	3.2.2
M71	Architectural and engineering activities; technical testing and analysis	3.2.2
M72	Scientific research and development	3.2.2
M73	Advertising and market research	3.2.2
M74	Other professional, scientific and technical activities	3.2.2
M75	Veterinary activities	3.2.2
N	Administrative and support service activities	
N77	Rental and leasing activities	3.2.4
N78	Employment activities	3.2.4
N79	Travel agency, tour operator and other reservation service and related activities	3.2.4
N80	Security and investigation activities	3.2.4
N81	Services to buildings and landscape activities	3.2.4
N82	Office administrative, office support and other business support activities	3.2.4
O	Public administration and defence; compulsory social security	
O84	Public administration and defence; compulsory social security	3.3.1
P	Education	
P85	Education	3.3.2
Q	Human health and social work activities	

INSPIRE	Reference: D2.8.III.4_v2.9		
TWG-LU	Data Specification on <i>Land Use</i>	2012-02-23	Page 154

Q86	Human health activities	3.3.3
Q87	Residential care activities	3.3.3 & 5.1
Q88	Social work activities without accommodation	3.3.3
R	Arts, entertainment and recreation	
R90	Creative, arts and entertainment activities	3.4.1
R91	Libraries, archives, museums and other cultural activities	3.4.1
R92	Gambling and betting activities	3.4.2
R93	Sports activities and amusement and recreation activities	3.4.3
S	Other services activities	
S94	Activities of membership organisations	3.2.4
S95	Repair of computers and personal and household goods	3.1.1
S96	Other personal service activities	3.1.4
T	Activities of households as employers; undifferentiated goods and services producing activities of households for own use	
T97	Activities of households as employers of domestic personnel	3.1.4
T98	Undifferentiated goods- and services-producing activities of private households for own use	3.1.4
U	Activities of extraterritorial organisations and bodies	
U99	Activities of extraterritorial organisations and bodies	3.2.4

SEEA code and definition		HILUCS code
LAND		
Agriculture		1.1
	Land under temporary crops	1.1
	Land under temporary meadows and pastures	1.1
	Land with temporary fallow	1.1
	Land under permanent crops	1.1
	Land under permanent meadows and pastures	1.1
	Land under protective cover	1.1
Forestry		1.2
	Forest land	1.2
	<i>Primary regenerated forest</i>	1.2.3
	<i>Other naturally regenerated forest</i>	1.2.2
	<i>Planted forest</i>	1.2.1
	Other wooded land	1.2
Land used for aquaculture		1.4
	Land used for hatcheries	1.4
	Managed grow-out sites on land	1.4
Use of built-up and related areas		
	Mining and quarrying	1.3
	Construction	Tbd (6.1?)
	Manufacturing	2 and 3
	Technical infrastructure	4.3
	Transport and storage	4.1 and 4.2
	Commercial, financial and public services	3.1, 3.2, 3.3
	Recreational facilities	3.4
	Residential	5.
	Land used for maintenance and restoration of environmental functions	Supplementary regulation
	Other uses of land n.e.c.	6.6
Land not in use		6.3.1
INLAND WATER		
	Inland waters used for aquaculture or holding facilities	1.4
	Inland water used for maintenance and restoration of environmental functions	Supplementary regulation
	Other uses of inland water n.e.c.	6.6
	Inland water not in use	6.3.2

INTERNAL WATERS		
	Internal waters used for aquaculture or holding facilities	1.4
	Internal waters used for maintenance and restoration of environmental functions	Supplementary regulation
	Other uses of internal waters n.e.c.	6.6
	Internal waters not in use	6.3.2
EXCLUSIVE ECONOMIC ZONE		
	EEZ areas used for aquaculture or holding facilities	1.4
	EEZ areas used for maintenance and restoration of environmental functions	Supplementary regulation
	Other uses of EEZ areas n.e.c.	6.6
	EEZ areas not in use	6.3.2

Urban Atlas code and definition		HILUCS code
1.1.1	Continuous Urban fabric (soil sealing >80%)	5.
1.1.2.1	Discontinuous dense urban fabric (soil sealing 50% - 80%)	5.
1.1.2.2	Discontinuous medium urban fabric (soil sealing 30% - 50%)	5.
1.1.2.3	Discontinuous low urban fabric (soil sealing 10% - 30%)	5.
1.1.2.4	Discontinuous very low urban fabric (soil sealing <10%)	5.
1.1.3	Isolated structure	5.
1.2.1	Industrial, commercial, public, military, private units	2. and 3.
1.2.2.1	Fast transit roads and associated land	4.1.1
1.2.2.2	Other roads and associated land	4.1.1
1.2.2.3	Railways and associated land	4.1.2
1.2.3	Port areas	4.1.4
1.2.4	Airports	4.1.3
1.3.1	Mineral extraction and dump sites	1.3 and 4.3.3
1.3.3	Construction sites	6.1
1.3.4	Land without current use	6.3.1, 6.3.2
1.4.1	Green urban areas	3.4.4
1.4.2	Sport and leisure facilities	3-4-3
2	Agricultural areas, semi-natural areas and wetlands	1.1 and several other classes
3	Forests	1.2
4	Water	several classes according to the use

C.5 HILUCS Frequently asked questions:

This list of questions and answers helps the HILUCS user to identify the proper class for rare, specific or borderline land use cases:

Q1: Under which class cemeteries belong?	A1: Cemeteries are part of class 3.3.5 'Other community services'
Q2: How can protected areas be classified?	A2: They are classified according to the land use (e.g. if forestry is allowed under 1.2). If no use is allowed they are classified under 6.3.1 Land areas not in other use. A supplementary regulation 'protected' is always needed.
Q3: Under which class irrigation ponds belong?	A3: They belong to class 1.1.1 'Commercial agricultural protection'.
Q4: How to classify industrial storage areas?	A4: They are part of the main industry branch, if adjacent to the industrial plant. Only pure storage and logistical services are classified under 4.2.

Q5: How to classify summer and other secondary residences?	A5: If they are privately owned they fall into 5.3 'Other residential use' if they are rented and linked to services they fall under class 3.1.3 Accommodation services.
Q6: where to map filling stations to	A6: filling station for vehicles will have two codes 3.1.1 because filling stations are wholesale and retail trade for fuel and 4.1.1. because they are road transport facilities (service station)

C.6 Mapping HILUCS with some specific classification systems

Mapping HILUCS in Flanders with Codex RO categories

WON = 'wonen' (cfr. Codex RO art. 2.2.3.§1, 1°)	5.1
WOO = 'woongebied' (cfr. Codex RO art. 2.2.3.§1, 1°, a)	5.1
WEL = 'gebied voor wonen en voor landbouw' (cfr. Codex RO art. 2.2.3.§1, 1°, b)	5.2
BED = 'bedrijvigheid' (cfr. Codex RO art. 2.2.3.§1, 2°)	2 and 3
REC = 'recreatie' (cfr. Codex RO art. 2.2.3.§1, 3°)	3.4
LDB = 'landbouw' (cfr. Codex RO art. 2.2.3.§1, 4°)	1.1
AGG = 'agrarisches gebied' (cfr. Codex RO art. 2.2.3.§1, 4°, a)	1.1
ABG = 'agrarische bedrijvenzone' (cfr. Codex RO art. 2.2.3.§1, 4°, b)	2.3.1
BAG = 'bouwvrij agrarisch gebied' (cfr. Codex RO art. 2.2.3.§1, 4°, c)	1.1
BOS = 'bos' (cfr. Codex RO art. 2.2.3.§1, 5°)	1.2
OVG = 'overig groen' (cfr. Codex RO art. 2.2.3.§1, 6°)	3.5
GOG = 'gemengd openruimtegebied' (cfr. Codex RO art. 2.2.3.§1, 6°, a)	3.5
PAG = 'parkgebied' (cfr. Codex RO art. 2.2.3.§1, 6°, b)	3.4
NAT = 'reservaat en natuur' (cfr. Codex RO art. 2.2.3.§1, 7°)	6.3
LNI = 'lijninfrastructuur' (cfr. Codex RO art. 2.2.3.§1, 8°)	4.
GNV = 'gemeenschaps- en nutsvoorzieningen' (cfr. Codex RO art. 2.2.3.§1, 9°)	3.3 and 4.3
OWA = 'ontginning en waterwinning' (cfr. Codex RO art. 2.2.3.§1, 10°)	1.3
IDW = 'gebied voor infrastructuur voor duurzame watervoorziening' (cfr. Codex RO art. 2.2.3.§1, 10°, a)	4.3.2
ONT = 'gebied voor de winning van oppervlaktedelfstoffen' (cfr. Codex RO art. 2.2.3.§1, 10°, b)	1.3
GVO = 'gebied voor de verwerking van oppervlaktedelfstoffen' (cfr. Codex RO art. 2.2.3.§1, 10°, c)	2.1

Mapping HILUCS in France with CNIG standard

Vocation principale d'une zone d'un document d'urbanisme de type POS et PLU.

00 : sans objet	6.5
01 : habitat	5.1
02 : activité	2 and 3
03 : destination mixte	5.2
04 : loisirs et tourisme	3.4
05 : équipement	4.
07 : activité agricole	1.1
08 : espace naturel	1.2 and 6.3
09 : espace remarquable (littoral L146-6 / montagne L145-7)	6.3 with supplementary regulation

10 : secteur de carrière
99 : autre

1.3

Mapping HILUCS in Germany for ELU according to 3A data model based on TN classification system

3A-code	3A-feature class
41001	AX_Wohnbaufläche
41002	AX_IndustrieUndGewerbeflaeche
41003	AX_Halde
41004	AX_Bergbaubetrieb
41005	AX_TagebauGrubeSteinbruch
41006	AX_FlaecheGemischterNutzung
41007	AX_FlaecheBesondererFunktionalerPraegung
41008	AX_SportFreizeitUndErholungsflaeche
41009	AX_Friedhof
42001	AX_Strassenverkehr
42006	AX_Weg
42009	AX_Platz
42010	AX_Bahnverkehr
42015	AX_Flugverkehr
42016	AX_Schiffsverkehr
43001	AX_Landwirtschaft
43002	AX_Wald
43003	AX_Gehoelz
43004	AX_Heide
43005	AX_Moor
43006	AX_Sumpf
43007	AX_UnlandVegetationsloseFlaeche
43008	AX_FlaecheZurZeitUnbestimmbar
44001	AX_Fliessgewaesser
44005	AX_Hafenbecken
44006	AX_StehendesGewaesser
44007	AX_Meer

6.6

In the following table the rightmost columns refer to an alternative way to model mixed land use by making use of several HILUCS classes being provided as an ordered list with the first item referring to a dominant land use.

3A-code	attribute 1: attribute=value (meaning)	attribute 2: attribute=value (meaning)	HILUCS-code	altern. HILUCS-code (1)	altern. HILUCS-code (2)
41001			5_1		
41001	ZUS=2100 (Außer Betrieb, stillgelegt, verlassen)		6_2		
41001	ZUS=8000 (Erweiterung, Neuansiedlung)		6_1		
41002	FKT=NULL		2		
41002	FKT=1400 (Handel und Dienstleistung)		3		
41002	FKT=1410 (Verwaltung, freie Berufe)		3		
41002	FKT=1420 (Bank, Kredit)		3_2_1		
41002	FKT=1430 (Versicherung)		3_2_1		
41002	FKT=1440 (Handel)		3_1_1		
41002	FKT=1450 (Ausstellung, Messe)		3_2_5		
41002	FKT=1460 (Beherbergung)		3_1_3		
41002	FKT=1470 (Restauration)		3_1_3		
41002	FKT=1480 (Vergnügung)		3_4_2		

INSPIRE	Reference: D2.8.III.4_v2.9		
TWG-LU	Data Specification on <i>Land Use</i>	2012-02-23	Page 158

41002	FKT=1490 (Gärtnerei)		3_1_1		
41002	FKT=1700 (Industrie und Gewerbe)		2		
41002	FKT=1701 (Gebäude- und Freifläche Industrie und Gewerbe)		2		
41002	FKT=1710 (Produktion)		2		
41002	FKT=1720 (Handwerk)		2		
41002	FKT=1730 (Tankstelle)		3_1_1		
41002	FKT=1740 (Lagerplatz)	LGT=NULL	2		
41002	FKT=1740 (Lagerplatz)	LGT=NULL	4_2		
41002	FKT=1740 (Lagerplatz)	LGT=1000 (Baustoffe)	4_2		
41002	FKT=1740 (Lagerplatz)	LGT=2000 (Kohle)	1_3_1		
41002	FKT=1740 (Lagerplatz)	LGT=3000 (Öl)	1_3_1		
41002	FKT=1740 (Lagerplatz)	LGT=4000 (Erde)	1_3_3		
41002	FKT=1740 (Lagerplatz)	LGT=5000 (Schutt)	1_3_3		
41002	FKT=1740 (Lagerplatz)	LGT=6000 (Schlacke)	1_3_2		
41002	FKT=1740 (Lagerplatz)	LGT=7000 (Abraum)	1_3_3		
41002	FKT=1740 (Lagerplatz)	LGT=8000 (Schrott, Altmaterial)	4_2		
41002	FKT=1740 (Lagerplatz)	LGT=9999 (Sonstiges)	4_2		
41002	FKT=1750 (Transport)		2		
41002	FKT=1760 (Forschung)		2		
41002	FKT=1770 (Grundstoff)		2		
41002	FKT=1780 (Betriebliche Sozialeinrichtungen)		3_3_3		
41002	FKT=1790 (Werft)		2_2_2		
41002	ZUS=2100 (Außer Betrieb, stillgelegt, verlassen)		6_2		
41002	FKT=2500 (Versorgungsanlagen)		4_3_1		
41002	FKT=2501 (Gebäude- und Freifläche Versorgungsanlagen)		4_3_1		
41002	FKT=2502 (Betriebliche Versorgungsanlage)		4_3_1		
41002	FKT=2510 (Förderanlage)	FGT=1000 (Erdöl)	1_3_1		
41002	FKT=2510 (Förderanlage)	FGT=2000 (Erdgas)	1_3_1		
41002	FKT=2510 (Förderanlage)	FGT=3000 (Sole, Lauge)	1_3_3		
41002	FKT=2510 (Förderanlage)	FGT=4000 (Kohlensäure)	1_3_3		
41002	FKT=2510 (Förderanlage)	FGT=5000 (Erdwärme)	2_4_4		
41002	FKT=2520 (Wasserwerk)		4_3_2		
41002	FKT=2521 (Gebäude- und Freifläche Versorgungsanlage, Wasser)		4_3_2		
41002	FKT=2522 (Betriebsfläche Versorgungsanlage, Wasser)		4_3_2		
41002	FKT=2530 (Kraftwerk)	PEG=NULL	2_4		
41002	FKT=2530 (Kraftwerk)	PEG=1000 (Wasser)	2_4_4		
41002	FKT=2530 (Kraftwerk)	PEG=2000 (Kernkraft)	2_4_1		
41002	FKT=2530 (Kraftwerk)	PEG=3000 (Sonne)	2_4_4		
41002	FKT=2530 (Kraftwerk)	PEG=4000 (Wind)	2_4_4		
41002	FKT=2530 (Kraftwerk)	PEG=5000 (Gezeiten)	2_4_4		
41002	FKT=2530 (Kraftwerk)	PEG=6000 (Erdwärme)	2_4_4		
41002	FKT=2530 (Kraftwerk)	PEG=7000 (Verbrennung)	2_4_2		
41002	FKT=2530 (Kraftwerk)	PEG=7100 (Kohle)	2_4_2		
41002	FKT=2530 (Kraftwerk)	PEG=7200 (Öl)	2_4_2		
41002	FKT=2530 (Kraftwerk)	PEG=7300 (Gas)	2_4_2		
41002	FKT=2530 (Kraftwerk)	PEG=7400 (Müll, Abfall)	2_4_2		
41002	FKT=2531 (Gebäude- und Freifläche Versorgungsanlagen, Elektrizität)		4_3_1		
41002	FKT=2532 (Betriebsfläche Versorgungsanlage, Elektrizität)		4_3_1		
41002	FKT=2540 (Umspannstation)		4_3_1		
41002	FKT=2550 (Raffinerie)		2_1_4		
41002	FKT=2551 (Gebäude- und Freifläche Versorgungsanlage, Öl)		2_1_4		
41002	FKT=2552 (Betriebsfläche Versorgungsanlage, Öl)		2_1_4		
41002	FKT=2560 (Gaswerk)		4_3_1		
41002	FKT=2561 (Gebäude- und Freifläche Versorgungsanlage, Gas)		4_3_1		
41002	FKT=2562 (Betriebsfläche Versorgungsanlage, Gas)		4_3_1		

INSPIRE	Reference: D2.8.III.4_v2.9		
TWG-LU	Data Specification on <i>Land Use</i>	2012-02-23	Page 159

41002	FKT=2570 (Heizwerk)	PEG=NULL	2_4		
41002	FKT=2570 (Heizwerk)	PEG=1000 (Wasser)	2_4_4		
41002	FKT=2570 (Heizwerk)	PEG=3000 (Sonne)	2_4_4		
41002	FKT=2570 (Heizwerk)	PEG=4000 (Wind)	2_4_4		
41002	FKT=2570 (Heizwerk)	PEG=5000 (Gezeiten)	2_4_4		
41002	FKT=2570 (Heizwerk)	PEG=6000 (Erdwärme)	2_4_4		
41002	FKT=2570 (Heizwerk)	PEG=7000 (Verbrennung)	2_4_2		
41002	FKT=2570 (Heizwerk)	PEG=7100 (Kohle)	2_4_2		
41002	FKT=2570 (Heizwerk)	PEG=7200 (Öl)	2_4_2		
41002	FKT=2570 (Heizwerk)	PEG=7300 (Gas)	2_4_2		
41002	FKT=2570 (Heizwerk)	PEG=7400 (Müll, Abfall)	2_4_2		
41002	FKT=2571 (Gebäude- und Freifläche Versorgungsanlage, Wärme)		4_3_1		
41002	FKT=2572 (Betriebsfläche Versorgungsanlage, Wärme)		4_3_1		
41002	FKT=2580 (Funk- und Fernmeldeanlage)		4_3_4		
41002	FKT=2581 (Gebäude- und Freifläche Versorgungsanlage, Funk- und Fernmeldewesen)		4_3_4		
41002	FKT=2582 (Betriebsfläche Versorgungsanlage, Funk- und Fernmeldewesen)		4_3_4		
41002	FKT=2600 (Entsorgung)		4_3_3		
41002	FKT=2601 (Gebäude- und Freifläche Entsorgungsanlage)		4_3_3		
41002	FKT=2602 (Betriebsfläche Entsorgungsanlage)		4_3_3		
41002	FKT=2610 (Kläranlage, Klärwerk)		4_3_2		
41002	FKT=2611 (Gebäude- und Freifläche Entsorgungsanlage, Abwasserbeseitigung)		4_3_2		
41002	FKT=2612 (Betriebsfläche Entsorgungsanlage, Abwasserbeseitigung)		4_3_2		
41002	FKT=2620 (Abfallbehandlungsanlage)		4_3_3		
41002	FKT=2621 (Gebäude- und Freifläche Entsorgungsanlage, Abfallbeseitigung)		4_3_3		
41002	FKT=2622 (Betriebsfläche Entsorgungsanlage, Abfallbeseitigung)		4_3_3		
41002	FKT=2623 (Betriebsfläche Entsorgungsanlage, Schlamm)		4_3_3		
41002	FKT=2630 (Deponie (oberirdisch))		4_3_3		
41002	FKT=2640 (Deponie (unterirdisch))		4_3_3		
41002	ZUS=8000 (Erweiterung, Neuansiedlung)		6_1		
41003	LGT=NULL		4_2		
41003	LGT=1000 (Baustoffe)		4_2		
41003	LGT=2000 (Kohle)		1_3_1		
41003	ZUS=2100 (Außer Betrieb, stillgelegt, verlassen)		6_2		
41003	LGT=4000 (Erde)		1_3_3		
41003	LGT=5000 (Schutt)		1_3_3		
41003	LGT=6000 (Schlacke)		1_3_2		
41003	LGT=7000 (Abraum)		1_3_3		
41003	LGT=8000 (Schrott, Altmaterial)		4_2		
41003	ZUS=8000 (Erweiterung, Neuansiedlung)		6_1		
41003	LGT=9999 (Sonstiges)		4_2		
41004	AGT=NULL		1_3		
41004	AGT=1000 (Erden, Lockergestein)		1_3_3		
41004	AGT=1001 (Ton)		1_3_3		
41004	AGT=1007 (Kalk, Kalktuff, Kreide)		1_3_3		
41004	AGT=2000 (Steine, Gestein, Festgestein)		1_3_3		
41004	AGT=2002 (Schiefer, Dachschiefer)		1_3_3		
41004	AGT=2003 (Metamorpher Schiefer)		1_3_3		
41004	AGT=2005 (Kalkstein)		1_3_3		
41004	AGT=2006 (Dolomitstein)		1_3_3		
41004	AGT=2013 (Basalt, Diabas)		1_3_3		
41004	AGT=2021 (Talkschiefer, Speckstein)		1_3_3		
41004	ZUS=2100 (Außer Betrieb, stillgelegt, verlassen)		6_2		
41004	AGT=3000 (Erze)		1_3_2		
41004	AGT=3001 (Eisen)		1_3_2		
41004	AGT=3002 (Buntmetallerze)		1_3_2		
41004	AGT=3003 (Kupfer)		1_3_2		

INSPIRE	Reference: D2.8.III.4_v2.9		
TWG-LU	Data Specification on <i>Land Use</i>	2012-02-23	Page 160

41004	AGT=3004 (Blei)	1_3_2		
41004	AGT=3005 (Zink)	1_3_2		
41004	AGT=3006 (Zinn)	1_3_2		
41004	AGT=3007 (Wismut, Kobalt, Nickel)	1_3_2		
41004	AGT=3008 (Uran)	1_3_1		
41004	AGT=3009 (Mangan)	1_3_2		
41004	AGT=3010 (Antimon)	1_3_2		
41004	AGT=3011 (Edelmetallerze)	1_3_2		
41004	AGT=4000 (Treib- und Brennstoffe)	1_3_1		
41004	AGT=4020 (Kohle)	1_3_1		
41004	AGT=4021 (Braunkohle)	1_3_1		
41004	AGT=4022 (Steinkohle)	1_3_1		
41004	AGT=4030 (Ölschiefer)	1_3_1		
41004	AGT=5000 (Industriemineralien, Salze)	1_3_3		
41004	AGT=5001 (Gipsstein)	1_3_3		
41004	AGT=5002 (Anhydritstein)	1_3_3		
41004	AGT=5003 (Steinsalz)	1_3_3		
41004	AGT=5004 (Kalisalz)	1_3_3		
41004	AGT=5005 (Kalkspat)	1_3_3		
41004	AGT=5006 (Flussspat)	1_3_3		
41004	AGT=5007 (Schwerspat)	1_3_3		
41004	AGT=5011 (Graphit)	1_3_3		
41004	ZUS=8000 (Erweiterung, Neuansiedlung)	6_1		
41005	AGT=NULL	1_3		
41005	AGT=1000 (Erden, Lockergestein)	1_3_3		
41005	AGT=1001 (Ton)	1_3_3		
41005	AGT=1002 (Bentonit)	1_3_3		
41005	AGT=1003 (Kaolin)	1_3_3		
41005	AGT=1004 (Lehm)	1_3_3		
41005	AGT=1005 (Löß, Lößlehm)	1_3_3		
41005	AGT=1006 (Mergel)	1_3_3		
41005	AGT=1007 (Kalk, Kalktuff, Kreide)	1_3_3		
41005	AGT=1008 (Sand)	1_3_3		
41005	AGT=1009 (Kies, Kiessand)	1_3_3		
41005	AGT=1011 (Farberden)	1_3_3		
41005	AGT=1012 (Quarzsand)	1_3_3		
41005	AGT=1013 (Kieselerde)	1_3_3		
41005	AGT=2000 (Steine, Gestein, Festgestein)	1_3_3		
41005	AGT=2001 (Tonstein)	1_3_3		
41005	AGT=2002 (Schiefer, Dachschiefer)	1_3_3		
41005	AGT=2003 (Metamorpher Schiefer)	1_3_3		
41005	AGT=2004 (Mergelstein)	1_3_3		
41005	AGT=2005 (Kalkstein)	1_3_3		
41005	AGT=2006 (Dolomitstein)	1_3_3		
41005	AGT=2007 (Travertin)	1_3_3		
41005	AGT=2008 (Marmor)	1_3_3		
41005	AGT=2009 (Sandstein)	1_3_3		
41005	AGT=2010 (Grauwacke)	1_3_3		
41005	AGT=2011 (Quarzit)	1_3_3		
41005	AGT=2012 (Gneis)	1_3_3		
41005	AGT=2013 (Basalt, Diabas)	1_3_3		
41005	AGT=2014 (Andesit)	1_3_3		
41005	AGT=2015 (Porphy, Quarzporphyr)	1_3_3		
41005	AGT=2016 (Granit)	1_3_3		
41005	AGT=2017 (Granodiorit)	1_3_3		
41005	AGT=2018 (Tuff-, Bimsstein)	1_3_3		
41005	AGT=2019 (Trass)	1_3_3		
41005	AGT=2020 (Lavaschlacke)	1_3_3		
41005	AGT=2021 (Talkschiefer, Speckstein)	1_3_3		
41005	ZUS=2100 (Außer Betrieb, stillgelegt, verlassen)	6_2		
41005	AGT=4000 (Treib- und Brennstoffe)	1_3_1		
41005	AGT=4010 (Torf)	1_3_1		
41005	AGT=4020 (Kohle)	1_3_1		

INSPIRE	Reference: D2.8.III.4_v2.9		
TWG-LU	Data Specification on <i>Land Use</i>	2012-02-23	Page 161

41005	AGT=4021 (Braunkohle)	1_3_1		
41005	AGT=4022 (Steinkohle)	1_3_1		
41005	AGT=4030 (Ölschiefer)	1_3_1		
41005	AGT=5000 (Industriemineralien, Salze)	1_3_3		
41005	AGT=5001 (Gipsstein)	1_3_3		
41005	AGT=5002 (Anhydritstein)	1_3_3		
41005	AGT=5005 (Kalkspat)	1_3_3		
41005	AGT=5007 (Schwerspat)	1_3_3		
41005	AGT=5008 (Quarz)	1_3_3		
41005	AGT=5009 (Feldspat)	1_3_3		
41005	AGT=5010 (Pegmatitstein)	1_3_3		
41005	ZUS=8000 (Erweiterung, Neuansiedlung)	6_1		
41006	FKT=NULL	5_2		
41006	FKT=2100 (Gebäude- und Freifläche, Mischnutzung mit Wohnen)	5_2		
41006	ZUS=2100 (Außer Betrieb, stillgelegt, verlassen)	6_2		
41006	FKT=2110 (Wohnen mit Öffentlich)	5_2	5_1	3_3
41006	FKT=2120 (Wohnen mit Handel und Dienstleistung)	5_2	5_1	3_1
41006	FKT=2130 (Wohnen mit Gewerbe und Industrie)	5_2	5_1	2_3
41006	FKT=2140 (Öffentlich mit Wohnen)	3_3_1	3_3	5_1
41006	FKT=2150 (Handel und Dienstleistung mit Wohnen)	3	3_1	5_1
41006	FKT=2160 (Gewerbe und Industrie mit Wohnen)	2	2_3	5_1
41006	FKT=2700 (Gebäude- und Freifläche Land- und Forstwirtschaft)	1_1_2		
41006	FKT=2710 (Wohnen)	5_2		
41006	FKT=2720 (Betrieb)	1_1_2		
41006	FKT=2730 (Wohnen und Betrieb)	5_2	5_1	1_1
41006	FKT=6800 (Landwirtschaftliche Betriebsfläche)	1_1_2		
41006	FKT=7600 (Forstwirtschaftliche Betriebsfläche)	1_2		
41006	ZUS=8000 (Erweiterung, Neuansiedlung)	6_1		
41007	FKT=NULL	3		
41007	FKT=1100 (Öffentliche Zwecke)	3_3_1		
41007	FKT=1110 (Verwaltung)	3_3_1		
41007	FKT=1120 (Bildung und Forschung)	3_3_2		
41007	FKT=1130 (Kultur)	3_4_1		
41007	FKT=1140 (Religiöse Einrichtung)	3_3_4		
41007	FKT=1150 (Gesundheit, Kur)	3_3_3		
41007	FKT=1160 (Soziales)	3_3_3		
41007	FKT=1170 (Sicherheit und Ordnung)	3_3_1		
41007	FKT=1200 (Parken)	4_1_1		
41007	FKT=1300 (Historische Anlagen)	3_4_1		
41007	FKT=1310 (Burg-, Festungsanlage)	3_4_1		
41007	FKT=1320 (Schlossanlage)	3_4_1		
41007	ZUS=2100 (Außer Betrieb, stillgelegt, verlassen)	6_2		
41007	ZUS=8000 (Erweiterung, Neuansiedlung)	6_1		
41008	FKT=NULL	3_4		
41008	ZUS=2100 (Außer Betrieb, stillgelegt, verlassen)	6_2		
41008	FKT=4001 (Gebäude- und Freifläche Sport, Freizeit und Erholung)	3_4_3		
41008	FKT=4100 (Sportanlage)	3_4_3		
41008	FKT=4101 (Gebäude- und Freifläche Erholung, Sport)	3_4_3		
41008	FKT=4110 (Golfplatz)	3_4_3		
41008	FKT=4120 (Sportplatz)	3_4_3		
41008	FKT=4130 (Rennbahn)	3_4_3		
41008	FKT=4140 (Reitplatz)	3_4_3		
41008	FKT=4150 (Schießanlage)	3_4_3		
41008	FKT=4160 (Eis-, Rollschuhbahn)	3_4_3		
41008	FKT=4170 (Tennisplatz)	3_4_3		
41008	FKT=4200 (Freizeitanlage)	3_4_2		
41008	FKT=4210 (Zoo)	3_4_1		
41008	FKT=4211 (Gebäude- u. Freifläche Erholung, Zoologie)	3_4_1		

INSPIRE	Reference: D2.8.III.4_v2.9		
TWG-LU	Data Specification on <i>Land Use</i>	2012-02-23	Page 162

41008	FKT=4220 (Safaripark, Wildpark)	3_4_1		
41008	FKT=4230 (Freizeitpark)	3_4_2		
41008	FKT=4240 (Freilichttheater)	3_4_1		
41008	FKT=4250 (Freilichtmuseum)	3_4_1		
41008	FKT=4260 (Autokino, Freilichtkino)	3_4_2		
41008	FKT=4270 (Verkehrsübungsplatz)	3_3_2		
41008	FKT=4280 (Hundeübungsplatz)	3_4_3		
41008	FKT=4290 (Modellflugplatz)	3_4_3		
41008	FKT=4300 (Erholungsfläche)	3_4_4		
41008	FKT=4301 (Gebäude- und Freifläche Erholung)	3_4_4		
41008	FKT=4310 (Wochenend- und Ferienhäuser)	3_1_3		
41008	FKT=4320 (Schwimmbad, Freibad)	3_4_3		
41008	FKT=4321 (Gebäude- und Freifläche Erholung, Bad)	3_4_3		
41008	FKT=4330 (Campingplatz)	3_1_3		
41008	FKT=4331 (Gebäude- und Freifläche Erholung, Camping)	3_1_3		
41008	FKT=4400 (Grünanlage)	3_4_4		
41008	FKT=4410 (Grünfläche)	3_4_4		
41008	FKT=4420 (Park)	3_4_4		
41008	FKT=4430 (Botanischer Garten)	3_4_1		
41008	FKT=4431 (Gebäude- und Freifläche Erholung, Botanik)	3_4_1		
41008	FKT=4440 (Kleingarten)	3_4_4		
41008	FKT=4450 (Wochenendplatz)	3_4_4		
41008	FKT=4460 (Garten)	1_1_3		
41008	FKT=4470 (Spielplatz, Bolzplatz)	3_4_4		
41008	ZUS=8000 (Erweiterung, Neuansiedlung)	6_1		
41008	FKT=9999 (Sonstiges)	3_4_5		
41009	FKT=NULL	3_3_4		
41009	FKT=9401 (Gebäude- und Freifläche Friedhof)	3_3_4		
41009	FKT=9402 (Friedhof (ohne Gebäude))	3_3_4		
41009	FKT=9403 (Friedhof (Park))	3_3_4		
41009	FKT=9404 (Historischer Friedhof)	3_4_1		
42001	FKT=NULL	4_1_1		
42001	ZUS=2100 (Außer Betrieb, stillgelegt, verlassen)	6_2		
42001	FKT=2311 (Gebäude- und Freifläche zu Verkehrsanlagen, Straße)	4_1_1		
42001	FKT=2312 (Verkehrsbegleitfläche Straße)	4_1_1		
42001	FKT=2313 (Straßenentwässerungsanlage)	4_1_1		
42001	ZUS=4000 (Im Bau)	6_1		
42001	FKT=5130 (Fußgängerzone)	4_1_1		
42006	FKT=NULL	4_1_1		
42006	FKT=5210 (Fahrweg)	4_1_1		
42006	FKT=5211 (Hauptwirtschaftsweg)	4_1_1		
42006	FKT=5212 (Wirtschaftsweg)	4_1_1		
42006	FKT=5220 (Fußweg)	4_1_1		
42006	FKT=5230 (Gang)	4_1_1		
42006	FKT=5240 (Radweg)	4_1_1		
42006	FKT=5250 (Rad- und Fußweg)	4_1_1		
42006	FKT=5260 (Reitweg)	4_1_1		
42006	FKT=9999 (Sonstiges)	4_1_1		
42009	FKT=NULL	4_1_1		
42009	FKT=5130 (Fußgängerzone)	4_1_1		
42009	FKT=5310 (Parkplatz)	4_1_1		
42009	FKT=5320 (Rastplatz)	4_1_1		
42009	FKT=5330 (Raststätte)	4_1_1		
42009	FKT=5340 (Marktplatz)	4_1_1		
42009	FKT=5350 (Festplatz)	3_4_2		
42010	FKT=NULL	4_1_2		
42010	BKT=NULL	4_1_2		
42010	BKT=1100 (Eisenbahn)	4_1_2		
42010	BKT=1102 (Güterverkehr)	4_1_2		
42010	BKT=1104 (S-Bahn)	4_1_2		

INSPIRE	Reference: D2.8.III.4_v2.9		
TWG-LU	Data Specification on <i>Land Use</i>	2012-02-23	Page 163

42010	BKT=1200 (Stadtbahn)		4_1_2		
42010	BKT=1201 (Straßenbahn)		4_1_2		
42010	BKT=1202 (U-Bahn)		4_1_2		
42010	BKT=1300 (Seilbahn, Bergbahn)		4_1_2		
42010	BKT=1301 (Zahnradbahn)		4_1_2		
42010	BKT=1302 (Standseilbahn)		4_1_2		
42010	BKT=1400 (Museumsbahn)		3_4_1		
42010	BKT=1500 (Bahn im Freizeitpark)		3_4_2		
42010	BKT=1600 (Magnetschwebebahn)		4_1_2		
42010	ZUS=2100 (Außer Betrieb, stillgelegt, verlassen)		6_2		
42010	FKT=2321 (Gebäude- und Freifläche zu Verkehrsanlagen, Schiene)		4_1_2		
42010	FKT=2322 (Verkehrsbegleitfläche Bahnverkehr)		4_1_2		
42010	ZUS=4000 (Im Bau)		6_1		
42015	FKT=NULL		4_1_3		
42015	ART=NULL		4_1_3		
42015	ZUS=2100 (Außer Betrieb, stillgelegt, verlassen)		6_2		
42015	ZUS=4000 (Im Bau)		6_1		
42015	FKT=5501 (Gebäude- und Freifläche zu Verkehrsanlagen, Luftfahrt)		4_1_3		
42015	ART=5510 (Flughafen)		4_1_3		
42015	ART=5511 (Internationaler Flughafen)		4_1_3		
42015	ART=5512 (Regionalflughafen)		4_1_3		
42015	ART=5520 (Verkehrslandeplatz)		4_1_3		
42015	ART=5530 (Hubschrauberflugplatz)		4_1_3		
42015	ART=5540 (Landepplatz, Sonderlandeplatz)		4_1_3		
42015	ART=5550 (Segelfluggelände)		4_1_3		
42016	FKT=NULL		4_1_4		
42016	ZUS=2100 (Außer Betrieb, stillgelegt, verlassen)		6_2		
42016	FKT=2341 (Gebäude- und Freifläche zu Verkehrsanlagen, Schifffahrt)		4_1_4		
42016	ZUS=4000 (Im Bau)		6_1		
42016	FKT=5610 (Hafenanlage (Landfläche))		4_1_4		
42016	FKT=5620 (Schleuse (Landfläche))		4_1_4		
42016	FKT=5630 (Anlegestelle)		4_1_4		
42016	FKT=5640 (Fähranlage)		4_1_4		
43001	VEG=NULL		1_1_1		
43001	VEG=1010 (Ackerland)		1_1_1		
43001	VEG=1011 (Streuobstacker)		1_1_1		
43001	VEG=1012 (Hopfen)		1_1_1		
43001	VEG=1013 (Spargel)		1_1_1		
43001	VEG=1020 (Grünland)		1_1_1		
43001	VEG=1021 (Streuobstwiese)		1_1_1		
43001	VEG=1030 (Gartenland)		1_1_1		
43001	VEG=1031 (Baumschule)		1_1_1		
43001	VEG=1040 (Weingarten)		1_1_1		
43001	VEG=1050 (Obstplantage)		1_1_1		
43001	VEG=1051 (Obstbaumpflanzung)		1_1_1		
43001	VEG=1052 (Obststrauchpflanzung)		1_1_1		
43001	VEG=1200 (Brachland)		1_1_1		
43002	VEG=NULL		1_2		
43002	VEG=1100 (Laubholz)		1_2		
43002	VEG=1200 (Nadelholz)		1_2		
43002	VEG=1300 (Laub- und Nadelholz)		1_2		
43002	VEG=1310 (Laubwald mit Nadelholz)		1_2		
43002	VEG=1320 (Nadelwald mit Laubholz)		1_2		
43003	VEG=NULL		1_2		
43003	VEG=1400 (Latschenkiefer)		1_2		
43004			6_3_1		
43005			6_3_1		
43006			6_3_1		
43007	FKT=NULL		6_3_1		
43007	FKT=1000 (Vegetationslose Fläche)	OFM=NULL	6_3_1		
43007	FKT=1000 (Vegetationslose Fläche)	OFM=1010 (Fels)	6_3_1		

INSPIRE	Reference: D2.8.III.4_v2.9		
TWG-LU	Data Specification on <i>Land Use</i>	2012-02-23	Page 164

43007	FKT=1000 (Vegetationslose Fläche)	OFM=1020 (Steine, Schotter)	6_3_1		
43007	FKT=1000 (Vegetationslose Fläche)	OFM=1030 (Geröll)	6_3_1		
43007	FKT=1000 (Vegetationslose Fläche)	OFM=1040 (Sand)	6_3_1		
43007	FKT=1000 (Vegetationslose Fläche)	OFM=1110 (Schnee)	6_3_1		
43007	FKT=1000 (Vegetationslose Fläche)	OFM=1120 (Eis, Firn)	6_3_2		
43007	FKT=1100 (Gewässerbegleitfläche)		4_1_4		
43007	FKT=1110 (Bebaute Gewässerbegleitfläche)		4_1_4		
43007	FKT=1120 (Unbebaute Gewässerbegleitfläche)		4_1_4		
43007	FKT=1200 (Sukzessionsfläche)		6_3_1		
43008			6_6		
44001	FKT=NULL		4_1_4		
44001	ZUS=2100 (Außer Betrieb, stillgelegt, verlassen)		6_2		
44001	ZUS=4000 (Im Bau)		6_1		
44001	FKT=8200 (Fluss)		4_1_4		
44001	FKT=8210 (Altwasser)		6_3_2		
44001	FKT=8220 (Altarm)		6_3_2		
44001	FKT=8230 (Flussmündungstrichter)		4_1_4		
44001	FKT=8300 (Kanal)		4_1_4		
44001	FKT=8400 (Graben)		6_3_2		
44001	FKT=8410 (Fleet)		4_1_4		
44001	FKT=8500 (Bach)		6_3_2		
44005	FKT=NULL		4_1_4		
44005	FKT=8810 (Sporthafenbecken)		4_1_4		
44006	FKT=NULL		6_3_2		
44006	FKT=8610 (See)		6_3_2		
44006	FKT=8620 (Teich)		3_4_4		
44006	FKT=8630 (Stausee)		4_3_2		
44006	FKT=8631 (Speicherbecken)		4_3_2		
44006	FKT=8640 (Baggersee)		1_3_3		
44006	FKT=9999 (Sonstiges)		6_3_2		
44007	FKT=NULL		6_3_2		
44007	FKT=8710 (Küstengewässer)		4_1_4		

Mapping HILUCS in Germany for planned land use with XPlanGML standard

XPlanGML class	HILUCSValue
BP_AufschuettungsFlaeche	6_OtherUse
FP_AufschuettungsFlaeche	6_OtherUse
BP_AbgrabungsFlaeche	1_3_Miningandquarrying
FP_AbgrabungsFlaeche	1_3_Miningandquarrying
BP_BodenschaetzeFlaeche	1_3_Miningandquarrying
FP_BodenschaetzeFlaeche	1_3_Miningandquarrying
BP_RekultivierungsFlaeche	6_OtherUse
BP_BaugebietsTeilFlaeche	
Kleinsiedlungsgebiet	5_3_OtherResidentialUse
ReinesWohngebiet	5_1_PureResidentialUse
AllgWohngebiet	5_ResidentialUse
BesonderesWohngebiet	5_3_OtherResidentialUse
Dorfgebiet	5_3_OtherResidentialUse 1_1_2_FarmingInfrastructure
Mischgebiet	5_2_ResidentialUseWithOtherCompatibleUse
Kerngebiet	3_1_CommercialServices 3_2_FinancialProfessionalAndInformationServices

	3_4_CulturalEntertainmentAndRecreationServices
Gewerbegebiet	2_3_LightEndProductIndustry
Industriegebiet	2_1_RawIndustry
SondergebietErholung	5_3_OtherResidentialUse
SondergebietSonst	3_5_OtherServices
Wochenendhausgebiet	5_3_OtherResidentialUse
Sondergebiet	3_5_OtherServices
SonstigesGebiet	3_5_OtherServices
FP_BebauungsFlaeche	
allgArtDerBaulNutzung	
WohnBauflaeche	5_ResidentialUse
GemischteBauflaeche	5_2_ResidentialUseWithOtherCompatibleUse
GewerblicheBauflaeche	2_SecondaryProduction
SonderBauflaeche	6_OtherUse
SonstigeBauflaeche	6_OtherUse
besondereArtDerBaulNutzung	
Kleinsiedlungsgebiet	5_3_OtherResidentialUse
ReinesWohngebiet	5_1_PureResidentialUse
AllgWohngebiet	5_ResidentialUse
BesonderesWohngebiet	5_3_OtherResidentialUse
Dorfgebiet	5_3_OtherResidentialUse 1_1_2_FarmingInfrastructure
Mischgebiet	5_2_ResidentialUseWithOtherCompatibleUse
Kerngebiet	3_1_CommercialServices 3_2_FinancialProfessionalAndInformationServices 3_3_CommunityServices
Gewerbegebiet	2_3_LightEndProductIndustry
Industriegebiet	2_SecondaryProduction
SondergebietErholung	5_3_OtherResidentialUse
SondergebietSonst	3_5_OtherServices
Wochenendhausgebiet	5_3_OtherResidentialUse
Sondergebiet	6_OtherUse
SonstigesGebiet	6_OtherUse
BP_BesondererNutzungszwecke Flaeche	6_OtherUse
BP_GemeinbedarfsFlaeche	3_3_CommunityServices
OffentlicheVerwaltung	3_3_1_PublicAdministrationDefenseAndSocialSecurityServices
BildungForschung	3_3_2_EducationalServices
Kirche	3_3_4_ReligiousServices
Sozial	3_3_3_HealthAndSocialServices
Gesundheit	3_3_3_HealthAndSocialServices
Kultur	3_4_1_CulturalServices
Sport	3_4_3_SportsInfrastructure
SicherheitOrdnung	3_3_1_PublicAdministrationDefenseAndSocialSecurityServices

Infrastruktur	4_3_Utilities
Sonstiges	3_5_OtherServices
FP_Gemeinbedarf	3_3_CommunityServices
OffentlicheVerwaltung	3_3_1_PublicAdministrationDefenseAndSocialSecurityServices
BildungForschung	3_3_2_EducationalServices
Kirche	3_3_4_ReligiousServices
Sozial	3_3_3_HealthAndSocialServices
Gesundheit	3_3_3_HealthAndSocialServices
Kultur	3_4_1_CulturalServices
Sport	3_4_3_SportsInfrastructure
SicherheitOrdnung	3_3_1_PublicAdministrationDefenseAndSocialSecurityServices
Infrastruktur	4_3_Utilities
Sonstiges	3_5_OtherServices
BP_SpielSportanlagenFlaeche	3_4_3_SportsInfrastructure
Sportanlage	3_4_3_SportsInfrastructure
Spielanlage	3_4_3_SportsInfrastructure
SpielSportanlage	3_4_3_SportsInfrastructure
Sonstiges	3_4_3_SportsInfrastructure
FP_SpielSportanlage	3_4_3_SportsInfrastructure
Sportanlage	3_4_3_SportsInfrastructure
Spielanlage	3_4_3_SportsInfrastructure
SpielSportanlage	3_4_3_SportsInfrastructure
Sonstiges	3_4_3_SportsInfrastructure
BP_GruenFlaeche	3_4_4_OpenAirRecreationalAreas
Parkanlage	3_4_4_OpenAirRecreationalAreas
Dauerkleingaerten	3_4_4_OpenAirRecreationalAreas
Sportplatz	3_4_3_SportsInfrastructure
Spielplatz	3_4_4_OpenAirRecreationalAreas
Zeltplatz	3_4_4_OpenAirRecreationalAreas
Badeplatz	3_4_4_OpenAirRecreationalAreas
FreizeitErholung	3_4_4_OpenAirRecreationalAreas
SpezGruenflaeche	3_4_4_OpenAirRecreationalAreas
Friedhof	3_5_OtherServices
Sonstiges	3_4_4_OpenAirRecreationalAreas
FP_Gruen	3_4_4_OpenAirRecreationalAreas
Parkanlage	3_4_4_OpenAirRecreationalAreas
Dauerkleingaerten	3_4_4_OpenAirRecreationalAreas
Sportplatz	3_4_3_SportsInfrastructure
Spielplatz	3_4_4_OpenAirRecreationalAreas
Zeltplatz	3_4_4_OpenAirRecreationalAreas
Badeplatz	3_4_4_OpenAirRecreationalAreas
FreizeitErholung	3_4_4_OpenAirRecreationalAreas
SpezGruenflaeche	3_4_4_OpenAirRecreationalAreas
Friedhof	3_5_OtherServices

Sonstiges	3_4_4_OpenAirRecreationalAreas
BP_Landwirtschaft	1_1_Agriculture
LandwirtschaftAllgemein	1_1_Agriculture
Ackerbau	1_1_1_CommercialAgriculturalProduction
WiesenWeidewirtschaft	1_1_1_CommercialAgriculturalProduction
GartenbaulicheErzeugung	1_1_1_CommercialAgriculturalProduction
Obstbau	1_1_1_CommercialAgriculturalProduction
Weinbau	1_1_1_CommercialAgriculturalProduction
Imkerei	1_1_1_CommercialAgriculturalProduction
Binnenfischerei	1_4_2_ProfessionalFishing
Sonstiges	1_1_Agriculture
FP_LandwirtschaftsFlaeche	1_1_Agriculture
LandwirtschaftAllgemein	1_1_Agriculture
Ackerbau	1_1_1_CommercialAgriculturalProduction
WiesenWeidewirtschaft	1_1_1_CommercialAgriculturalProduction
GartenbaulicheErzeugung	1_1_1_CommercialAgriculturalProduction
Obstbau	1_1_1_CommercialAgriculturalProduction
Weinbau	1_1_1_CommercialAgriculturalProduction
Imkerei	1_1_1_CommercialAgriculturalProduction
Binnenfischerei	1_4_2_ProfessionalFishing
Sonstiges	1_1_Agriculture
BP_WaldFlaeche	1_2_Forestry
Naturwald	6_3_1_LandAreasInNaturalUse
Nutzwald	1_2_Forestry
Erholungswald	3_4_4_OpenAirRecreationalAreas
Schutzwald	6_3_1_LandAreasInNaturalUse
FlaecheForstwirtschaft	1_2_Forestry
Sonstiges	1_2_Forestry
FP_Wald	1_2_Forestry
Naturwald	6_3_1_LandAreasInNaturalUse
Nutzwald	1_2_Forestry
Erholungswald	3_4_4_OpenAirRecreationalAreas
Schutzwald	6_3_1_LandAreasInNaturalUse
FlaecheForstwirtschaft	1_2_Forestry
Sonstiges	1_2_Forestry
BP_KleintierhaltungFlaeche	1_1_3_AgriculturalProductionForOwnConsumption
BP_Schutzgebiet	6_OtherUse
SO_SchutzgebietNaturschutzrecht	6_OtherUse
BP_SchutzPflege	6_OtherUse
Entwicklungsmassnahme	
BP_AusgleichsMassnahme	6_OtherUse
BP_AnpflanzungBindungErhaltung	6_OtherUse
BP_SchutzPflegeEntwicklungs	6_OtherUse

Flaeche	
BP_AusgleichsFlaeche	6_OtherUse
FP_AusgleichsFlaeche	6_OtherUse
FP_SchutzPflegeEntwicklung	6_OtherUse
BP_KennzeichnungsFlaeche	6_OtherUse
FP_Kennzeichnung	6_OtherUse
BP_GenerischesObjekt	6_OtherUse
BP_UnverbindlicheVormerkung	6_OtherUse
FP_UnverbindlicheVormerkung	6_OtherUse
FP_GenerischesObjekt	6_OtherUse
FP_VorbehalteFlaeche	6_OtherUse
FP_PrivilegiertesVorhaben	6_OtherUse
BP_VerEntsorgung	4_3_Utilities
Elektrizitaet	4_3_1_ElectricityGasAndThermalPowerDistributionServices
Gas	4_3_1_ElectricityGasAndThermalPowerDistributionServices
Erdoel	4_3_1_ElectricityGasAndThermalPowerDistributionServices
Waermeversorgung	4_3_1_ElectricityGasAndThermalPowerDistributionServices
Trinkwasser	4_3_2_WaterAndSewageInfrastructure
Abwasser	4_3_2_WaterAndSewageInfrastructure
Regenwasser	4_3_2_WaterAndSewageInfrastructure
Abfallentsorgung	4_3_3_WasteTreatment
Ablagerung	4_3_3_WasteTreatment
Telekommunikation	4_3_4_OtherUtilities
Sonstiges	4_3_4_OtherUtilities
FP_VerEntsorgung	4_3_Utilities
Elektrizitaet	4_3_1_ElectricityGasAndThermalPowerDistributionServices
Gas	4_3_1_ElectricityGasAndThermalPowerDistributionServices
Erdoel	4_3_1_ElectricityGasAndThermalPowerDistributionServices
Waermeversorgung	4_3_1_ElectricityGasAndThermalPowerDistributionServices
Trinkwasser	4_3_2_WaterAndSewageInfrastructure
Abwasser	4_3_2_WaterAndSewageInfrastructure
Regenwasser	4_3_2_WaterAndSewageInfrastructure
Abfallentsorgung	4_3_3_WasteTreatment
Ablagerung	4_3_3_WasteTreatment
Telekommunikation	4_3_4_OtherUtilities
Sonstiges	4_3_4_OtherUtilities
BP_Verkehrsflaeche	4_1_5_OtherTransportNetwork
BesondererZweckbestimmung	
Parkierungsflaeche	4_1_5_OtherTransportNetwork
Fussgaengerbereich	4_1_5_OtherTransportNetwork
VerkehrsberuhigterBereich	4_1_5_OtherTransportNetwork
RadFussweg	4_1_5_OtherTransportNetwork
Radweg	4_1_5_OtherTransportNetwork

INSPIRE	Reference: D2.8.III.4_v2.9		
TWG-LU	Data Specification on <i>Land Use</i>	2012-02-23	Page 169

Fussweg	4_1_5_OtherTransportNetwork
Wanderweg	4_1_5_OtherTransportNetwork
Wirtschaftsweg	4_1_5_OtherTransportNetwork
FahrradAbstellplatz	4_1_5_OtherTransportNetwork
UeberfuehrenderVerkehrsweg	4_1_5_OtherTransportNetwork
UnterfuehrenderVerkehrsweg	4_1_5_OtherTransportNetwork
P_RAnlage	4_1_5_OtherTransportNetwork
Platz	4_1_5_OtherTransportNetwork
Anschlussflaeche	4_1_5_OtherTransportNetwork
LandwirtschaftlicherVerkehr	4_1_5_OtherTransportNetwork
Verkehrsrugruen	4_1_5_OtherTransportNetwork
Sonstiges	4_1_5_OtherTransportNetwork
FP_Strassenverkehr	4_1_1_RoadTraffic
Autobahn	4_1_1_RoadTraffic
Hauptverkehrsstrasse	4_1_1_RoadTraffic
SonstigerVerkehrswegAnlage	4_1_1_RoadTraffic
RuhenderVerkehr	4_1_1_RoadTraffic
Sonstiges	4_1_1_RoadTraffic
SO_Strassenverkehrsrecht	4_1_1_RoadTraffic
Bundesautobahn	4_1_1_RoadTraffic
Bundesstrasse	4_1_1_RoadTraffic
LandesStaatsstrasse	4_1_1_RoadTraffic
Kreisstrasse	4_1_1_RoadTraffic
SonstOeffentlStrasse	4_1_1_RoadTraffic
BP_StrassenVerkehrsFlaeche	4_1_1_RoadTraffic
SO_Schienenverkehrsrecht	4_1_2_RailwayTraffic
Bahnanlage	4_1_2_RailwayTraffic
Bahnlinie	4_1_2_RailwayTraffic
OEPNV	4_1_2_RailwayTraffic
Sonstiges	4_1_2_RailwayTraffic
SO_Luftverkehrsrecht	4_1_3_AirTraffic
Flughafen	4_1_3_AirTraffic
Landeplatz	4_1_3_AirTraffic
Segelfluggelaende	4_1_3_AirTraffic
HubschrauberLandeplatz	4_1_3_AirTraffic
Ballonstartplatz	4_1_3_AirTraffic
Haengegleiter	4_1_3_AirTraffic
Gleitsegler	4_1_3_AirTraffic
Sonstiges	4_1_3_AirTraffic
BP_GewaesserFlaeche	6_3_2_WaterAreasInNaturalUse
Hafen	4_1_4_WaterTraffic
Wasserflaeche	6_3_2_WaterAreasInNaturalUse
Fliessgewaesser	6_3_2_WaterAreasInNaturalUse

Sonstiges	6_3_2_WaterAreasInNaturalUse
FP_Gewaesser	6_3_2_WaterAreasInNaturalUse
Hafen	4_1_4_WaterTraffic
Wasserflaeche	6_3_2_WaterAreasInNaturalUse
Fliessgewaesser	6_3_2_WaterAreasInNaturalUse
Sonstiges	6_3_2_WaterAreasInNaturalUse
BP_WasserwirtschaftsFlaeche	6_OtherUse
FP_Wasserwirtschaft	6_OtherUse
SO_Wasserrecht	6_OtherUse
Gewaesser1Ordnung	6_3_2_WaterAreasInNaturalUse
Gewaesser2Ordnung	6_3_2_WaterAreasInNaturalUse
Gewaesser3Ordnung	6_3_2_WaterAreasInNaturalUse
Ueberschwemmungsgebiet	6_OtherUse
Festgesetztes Ueberschwemmungsgebiet	6_OtherUse
NochNichtFestgesetztes Ueberschwemmungsgebiet	6_OtherUse
UeberschwemmGefaehrdetesGebiet	6_OtherUse
Sonstiges	6_OtherUse
SO_SchutzgebietWasserrecht	6_OtherUse
SO_Denkmalenschutzrecht	6_OtherUse
SO_Forstrecht	6_OtherUse
SO_Bodenschutzrecht	6_OtherUse
SO_SonstigesRecht	6_OtherUse
Bauschutzbereich	6_OtherUse
Berggesetz	6_OtherUse
Richtfunkverbindung	6_OtherUse
Truppenuebungsplatz	3_3_1_PublicAdministrationDefenseAndSocialSecurityServices
Vermessungskatasterrecht	6_OtherUse
Sonstiges	6_OtherUse
SO_SchutzgebietSonstRecht	6_OtherUse
SO_Gebiet	6_OtherUse

Mapping Dutch LGN to HILUCS

Code	Main class	Subgroup	Class	HILUCS
1	Agricultural areas		pasture	1.1.1
2			maize	1.1.1
3			potatoes	1.1.1
4			sugar beet	1.1.1
5			cereals	1.1.1
6			other agricultural crops	1.1.1
61			tree nurseries	1.1.1
62			fruit cultivation	1.1.1

8			greenhouses	1.1.1
9			orchards	1.1.1
10			flower bulbs	1.1.1
26			built-up areas outside urban areas	5.1
11	Forest		deciduous forest	1.2
12			coniferous forest	1.2
16	Water		fresh water	6.3.2, 4.1.4
17			salt water	6.3.2
18	Urban areas		urban built-up areas	5.1, 3.2, 3.1, 2
19			semi urban built-up areas	3.3, 5.2, 4.3
20			forest in built-up areas	3.4.4, 5.2
22			forest in semi built-up areas	3.4.4, 5.2
23			grass in built-up areas	5.2, 3.2, 3.1, 2
24			bare soil in built-up areas	5.3
28			grass in semi built-up areas	3.4.4, 5.2, 1.3.1, 3.3, 4.3
25	Infrastructure		main roads & railways	4.1.1, 4.1.2
30	Natural areas	Coastal areas	mudflats	6.3.1
31			coastal sands	6.3.1
32			dune areas with low vegetation	6.3.1
33			dune areas with high vegetation	6.3.1
34			heathland in coastal areas	6.3.1
35		Moors & heathland	drifting sands / river sandbanks	6.3.1
36			heathland	6.3.1
37			grassy heathland	6.3.1
38			very grassy heathland	6.3.1
39		Peat bogs	raised bogs	6.3.1
40			forest in raised bogs	6.3.1
41		Swamp areas	other swamp vegetation	6.3.1
42			reeds	6.3.1
43			forest in swamp areas	6.3.1
45			natural grasslands	6.3.1

Mapping Dutch BBG to HILUCS

Main class	Class	Description	HILUCS
1	Transport		
	10	Railroad	4.1.2
	11	Main road	4.1.1
	12	Airport	4.1.3
2	Built-up area		
	20	Residential	5
	21	Retail trade, hotel and catering	3.1.1
	22	Public institutions	4.3.2, 3.3.1, 4.3.1
	23	Socio-cultural facility	3.3.2, 3.3.3, 3.4.1, 3.4.2
	24	Industrial area and offices	3.2, 2
3	Semi built-up		
	30	Dumping site	4.3.3

31	Car wreck site	4.3.3
32	Cemetery	3.3.5
33	Mining area	1.3.1
34	Building site	6.1
35	Other semi built-up area	6.5
4 Recreation		
40	Park and public garden	3.4.4
41	Sports ground (incl. car parks)	3.4.3
42	Allotment garden	3.4.4, 1.1.3
43	Area for daytrips	3.4.4
44	Holiday recreation	3.4.5, 5.3
5 Agriculture		
50	Greenhouses	1.1.1
51	Other agricultural usage	1.1.1
6 Woodland and Nature		
60	Woodland	1.2
61	Dry natural area	6.3.1
62	Wet natural area	6.3.1
7 Inland water		
70	"IJsselmeer/Markermeer"	6.3.2
71	Enclosed estuary	6.3.2
72	"Rijn & Maas"	4.1.4
73	"Randmeer "	6.3.2
74	Water reservoir	4.3.2
75	Water with recreational usage	3.4.4
76	Water where minerals are extracted	1.3.1
77	Area for storing industrial water	4.3.3
78	Other inland water	6.3.2
8 Tidal waters		
80	"Waddenzee, Eems, Dollard"	6.3.2
81	"Oosterschelde"	6.3.2
82	"Westerschelde"	6.3.2
83	"Noordzee"	6.3.2
9 Foreign countries		
90	Foreign countries	

Mapping HILUCS in Spain with SIOSE classes

SIOSE Class (Español / English)	HILUCSValue
Cultivo de arroz / Rice	1_1_1_CommercialAgriculturalProduction
Cultivos herbáceos distintos de arroz / Herbaceous other than rice	1_1_1_CommercialAgriculturalProduction
Cultivos leñosos de frutales cítricos / Citrus fruit trees	1_1_1_CommercialAgriculturalProduction
Cultivos leñosos de frutales no cítricos / Non-citrus fruit trees	1_1_1_CommercialAgriculturalProduction
Viñedo / Vineyard	1_1_1_CommercialAgriculturalProduction
Olivar / Olive grove	1_1_1_CommercialAgriculturalProduction
Otros cultivos leñosos / Other woody crops	1_1_1_CommercialAgriculturalProduction
Prados / Pastures	1_1_1_CommercialAgriculturalProduction
Olivar y Viñedo / Olive grove-vineyard	1_1_1_CommercialAgriculturalProduction
Agrícola-Ganadero / Farming	1_1_2_FarmingInfrastructure
Asentamiento agrícola residencial / Agricultural settlement	1_1_3_AgriculturalProductionForOwnConsumption
Huerta familiar / Home orchard	1_1_3_AgriculturalProductionForOwnConsumption
Primario forestal / Logging	1_2_Forestry

INSPIRE	Reference: D2.8.III.4_v2.9		
TWG-LU	Data Specification on <i>Land Use</i>	2012-02-23	Page 173

Attribute: Función de cortafuegos / firebreak function	1_2_Forestry
Attribute: Cortas / clear cuts	1_2_Forestry
Minero-extractivo / Mining	1_3_Mining and quarrying
Piscifactoría / Fish farming	1_4_1_Aquaculture
Polígono industrial ordenado / Planned industrial park	2_SecondaryProduction
Polígono industrial sin ordenar / Non-planned industrial park	2_SecondaryProduction
Industria aislada / Isolated industry	2_SecondaryProduction
Nuclear / Nuclear	2_4_1_Nuclear
Térmica / Thermal	2_4_2_Fossil
Eólica / Wind power	2_4_4_Renewable
Solar / Solar	2_4_4_Renewable
Hidroeléctrica / Hydroelectric	2_4_4_Renewable
Comercial y oficinas / Commercial and business park	3_1_CommercialServices
Telecomunicaciones / Telecommunications	3_2_3_Information_and communication services
Administrativo Institucional / Government	3_3_1_PublicAdministrationDefenseAndSocialSecurityServices
Penitenciario / Penitentiary	3_3_1_PublicAdministrationDefenseAndSocialSecurityServices
Educación / Educational	3_3_2_EducationalServices
Sanitario / Health	3_3_3_HealthAndSocialServices
Religioso / Religious	3_3_4_ReligiousServices
Cementerio / Cemetery	3_3_5_OtherCommunityServices
Cultural / Cultural	3_4_1_CulturalServices
Parque recreativo / Amusement park	3_4_2_EntertainmentServices
Deportivo / Sports	3_4_3_SportsInfrastructure
Campo de golf / Golf course	3_4_3_SportsInfrastructure
Camping / Campsite	3_4_4_OpenAirRecreationalAreas
Parque urbano / Urban park	3_4_4_OpenAirRecreationalAreas
Zona verde artificial / Green urban area	3_4_4_OpenAirRecreationalAreas
Complejo hotelero / Hotel resort	3_5_OtherServices
Red viaria / Road network	4_1_1_RoadTraffic
Vial, aparcamiento o zona peatonal / Roads, parking lots and other artificial surfaces	4_1_1_RoadTraffic
Red ferroviaria / Rail network	4_1_2_RailwayTraffic
Aeroportuario / Airport	4_1_3_AirTraffic
Portuario / Port	4_1_4_WaterTraffic
Eléctrica / Electric	4_3_1_Electricity_GasAndThermalPowerDistributionServices
Gaseoducto-Oleoducto / Pipeline	4_3_1_Electricity_GasAndThermalPowerDistributionServices
Depuradoras y potabilizadoras / Water treatment	4_3_2_WaterAndSewageInfrastructure
Conducciones y canales / Water supply network	4_3_2_WaterAndSewageInfrastructure
Desalinizadora / Desalination plant	4_3_2_WaterAndSewageInfrastructure
Vertederos y escombreras / Dump site	4_3_3_WasteTreatment
Plantas de tratamiento / Waste treatment plant	4_3_3_WasteTreatment
Depending on density(=percentage) of residential buildings and other uses' buildings: Urbano discontinuo / Discontinuous	5_1_PureResidentialUse 5_2_ResidentialUseWithOtherCompatibleUse
Depending on density(=percentage) of residential buildings and other uses' buildings: Ensanche urbano / Urban expansion area	5_1_PureResidentialUse 5_2_ResidentialUseWithOtherCompatibleUse
Depending on density(=percentage) of residential buildings and other uses' buildings: Casco urbano / Town centre	5_1_PureResidentialUse 5_2_ResidentialUseWithOtherCompatibleUse
Attribute: En construcción / under construction	6_1_TransitionalAreas
Playas, dunas y arenales / Beaches, dunes and sand plains	6_3_1_LandAreasNotInOtherUse
Rambla / Dry riverbed	6_3_1_LandAreasNotInOtherUse
Zonas pantanosas / Marshes	6_3_1_LandAreasNotInOtherUse
Turberas / Peat bogs	6_3_1_LandAreasNotInOtherUse
Salinas continentales / Inland salines	6_3_1_LandAreasNotInOtherUse
Marismas / Coastal marshes	6_3_1_LandAreasNotInOtherUse
Salinas marinas / Coastal salines	6_3_1_LandAreasNotInOtherUse
Dehesa / Dehesa	6_3_1_LandAreasNotInOtherUse

INSPIRE	Reference: D2.8.III.4_v2.9		
TWG-LU	Data Specification on <i>Land Use</i>	2012-02-23	Page 174

Pastizal / Grassland	6_3_1_LandAreasNotInOtherUse
Frondosas caducifolias / Deciduous broad-leaved	6_3_1_LandAreasNotInOtherUse
Frondosas perennifolias / Evergreen broad-leaved	6_3_1_LandAreasNotInOtherUse
Coníferas / Coniferous	6_3_1_LandAreasNotInOtherUse
Matorral / Shrub	6_3_1_LandAreasNotInOtherUse
Suelo desnudo / Bare soil	6_3_1_LandAreasNotInOtherUse
Zonas quemadas / Burnt areas	6_3_1_LandAreasNotInOtherUse
Glaciares y nieves perpetuas / Glaciers and perpetual snow	6_3_1_LandAreasNotInOtherUse
Acantilados marinos / Sea cliff	6_3_1_LandAreasNotInOtherUse
Afloramientos rocosos y roquedo / Outcrop	6_3_1_LandAreasNotInOtherUse
Canchales / Scree	6_3_1_LandAreasNotInOtherUse
Colada lávica / Quaternary lava flow	6_3_1_LandAreasNotInOtherUse
Cursos de agua / Water courses	6_3_2_WaterAreasNotInOtherUse
Lagos y lagunas / Lakes and lagoons	6_3_2_WaterAreasNotInOtherUse
Embalse / Reservoir	6_3_2_WaterAreasNotInOtherUse
Lagunas costeras / Coastal lagoons	6_3_2_WaterAreasNotInOtherUse
Estuario / Estuaries	6_3_2_WaterAreasNotInOtherUse
Mares y océanos / Sea and ocean	6_3_2_WaterAreasNotInOtherUse
Edificación / Buildings	6_6_NotKnownUse
Lámina de agua artificial / Artificial water body	6_6_NotKnownUse
Otras construcciones / Other constructions	6_6_NotKnownUse
Suelo no edificado / Non-built soil	6_6_NotKnownUse
Zonas de extracción o vertido / Extraction and dumping	6_6_NotKnownUse

Mapping HILUCS in Spain with MCA of Navarra classes

MCA Class (Español / English)	HILUCSValue
Cultivos herbaceos / Herbaceous	1_1_1_CommercialAgriculturalProduction
Aromáticas/ Aromatics	1_1_1_CommercialAgriculturalProduction
Invernaderos/Forced crops	1_1_1_CommercialAgriculturalProduction
Albaricoque/Apricot tree	1_1_1_CommercialAgriculturalProduction
Almendra/Almond tree	1_1_1_CommercialAgriculturalProduction
Cerezo/Cherry tree	1_1_1_CommercialAgriculturalProduction
Ciruelo/Plum tree	1_1_1_CommercialAgriculturalProduction
Kiwi/Kiwi	1_1_1_CommercialAgriculturalProduction
Manzano/Apple Tree	1_1_1_CommercialAgriculturalProduction
Membrillo/Quince Tree	1_1_1_CommercialAgriculturalProduction
Melocotón/Peach Tree	1_1_1_CommercialAgriculturalProduction
Nogal/Walnut tree	1_1_1_CommercialAgriculturalProduction
Peral/Pear tree	1_1_1_CommercialAgriculturalProduction
Vivero viña/Vine nursery	1_1_1_CommercialAgriculturalProduction
Vivero forestal/Forestry nursery	1_1_1_CommercialAgriculturalProduction
Pacharán/Sloe bush	1_1_1_CommercialAgriculturalProduction
Viñedo / Vineyard	1_1_1_CommercialAgriculturalProduction
Olivar / Olive grove	1_1_1_CommercialAgriculturalProduction
Prados / Pastures	1_1_1_CommercialAgriculturalProduction
Agrícola-Ganadero / Farming	1_1_2_FarmingInfrastructure
Asentamiento agrícola residencial / Agricultural settlement	1_1_3_AgriculturalProductionForOwnConsumption
Huerta familiar / Home orchard	1_1_3_AgriculturalProductionForOwnConsumption
Primario forestal / Logging	1_2_Forestry
Minero-extractivo / Mining	1_3_Mining and quarrying
Piscifactoría / Fish farming	1_4_1_Aquaculture
Polígono industrial ordenado / Planned industrial park	2_SecondaryProduction
Polígono industrial sin ordenar / Non-planned industrial park	2_SecondaryProduction
Industria aislada / Isolated industry	2_SecondaryProduction
Nuclear / Nuclear	2_4_1_Nuclear
Térmica / Thermal	2_4_2_Fossil

INSPIRE	Reference: D2.8.III.4_v2.9		
TWG-LU	Data Specification on <i>Land Use</i>	2012-02-23	Page 175

Eólica / Wind power	2_4_4_Renewable
Solar / Solar	2_4_4_Renewable
Hidroeléctrica / Hydroelectric	2_4_4_Renewable
Comercial y oficinas / Commercial and business park	3_1_CommercialServices
Telecomunicaciones / Telecommunications	3_2_3_Information_and_communication_services
Administrativo Institucional / Government	3_3_1_PublicAdministrationDefenseAndSocialSecurityServices
Penitenciario / Penitentiary	3_3_1_PublicAdministrationDefenseAndSocialSecurityServices
Educación / Educational	3_3_2_EducationalServices
Sanitario / Health	3_3_3_HealthAndSocialServices
Religioso / Religious	3_3_4_ReligiousServices
Cementerio / Cemetery	3_3_5_OtherCommunityServices
Cultural / Cultural	3_4_1_CulturalServices
Parque recreativo / Amusement park	3_4_2_EntertainmentServices
Deportivo / Sports	3_4_3_SportsInfrastructure
Campo de golf / Golf course	3_4_3_SportsInfrastructure
Camping / Campsite	3_4_4_OpenAirRecreationalAreas
Parque urbano / Urban park	3_4_4_OpenAirRecreationalAreas
Zona verde artificial / Green urban area	3_4_4_OpenAirRecreationalAreas
Complejo hotelero / Hotel resort	3_5_OtherServices
Red viaria / Road network	4_1_1_RoadTraffic
Vial, aparcamiento o zona peatonal / Roads, parking lots and other artificial surfaces	4_1_1_RoadTraffic
Red ferroviaria / Rail network	4_1_2_RailwayTraffic
Aeroportuario / Airport	4_1_3_AirTraffic
Portuario / Port	4_1_4_WaterTraffic
Eléctrica / Electric	4_3_1_Electricity_GasAndThermalPowerDistributionServices
Gaseoducto-Oleoducto / Pipeline	4_3_1_Electricity_GasAndThermalPowerDistributionServices
Depuradoras y potabilizadoras / Water treatment	4_3_2_WaterAndSewageInfrastructure
Conducciones y canales / Water supply network	4_3_2_WaterAndSewageInfrastructure
Vertederos y escombreras / Dump site	4_3_3_WasteTreatment
Plantas de tratamiento / Waste treatment plant	4_3_3_WasteTreatment
Depending on density(=percentage) of residential buildings and other uses' buildings:	5_1_PureResidentialUse
Urbano discontinuo / Discontinuous	5_2_ResidentialUseWithOtherCompatibleUse
Depending on density(=percentage) of residential buildings and other uses' buildings:	5_1_PureResidentialUse
Ensanche urbano / Urban expansion area	5_2_ResidentialUseWithOtherCompatibleUse
Depending on density(=percentage) of residential buildings and other uses' buildings:	5_1_PureResidentialUse
Casco urbano / Town centre	5_2_ResidentialUseWithOtherCompatibleUse
Attribute: En construcción / under construction	6_1_TransitionalAreas
Salinas continentales / Inland salines	6_3_1_LandAreasNotInOtherUse
Pastizal / Grassland	6_3_1_LandAreasNotInOtherUse
Suelo desnudo / Bare soil	6_3_1_LandAreasNotInOtherUse
Zonas quemadas / Burnt areas	6_3_1_LandAreasNotInOtherUse
Glaciares y nieves perpetuas / Glaciers and perpetual snow	6_3_1_LandAreasNotInOtherUse
Acantilados marinos / Sea cliff	6_3_1_LandAreasNotInOtherUse
Afloramientos rocosos y roquedo / Outcrop	6_3_1_LandAreasNotInOtherUse
Canchales / Scree	6_3_1_LandAreasNotInOtherUse
Helechal/ (Pteridium aquilinum)	6_3_1_LandAreasNotInOtherUse
Brezal/Heather-Gorse	6_3_1_LandAreasNotInOtherUse
Bojeral/(Buxus sempervirens)	6_3_1_LandAreasNotInOtherUse
Carrizal/(Phragmites australis)	6_3_1_LandAreasNotInOtherUse
Coscojar/(Quercus coccifera)	6_3_1_LandAreasNotInOtherUse
Enebral/(Juniperus sp.)	6_3_1_LandAreasNotInOtherUse
Espartal/(Lygeum spartum)	6_3_1_LandAreasNotInOtherUse
Matorral mediterráneo/Mediterranean scrubland	6_3_1_LandAreasNotInOtherUse
Retamar/(Cytisus scoparius)	6_3_1_LandAreasNotInOtherUse
Matorral zarzas/Thornbush-Brambles	6_3_1_LandAreasNotInOtherUse

INSPIRE	Reference: D2.8.III.4_v2.9		
TWG-LU	Data Specification on <i>Land Use</i>	2012-02-23	Page 176

Pastos de alta montaña/High mountain pasture	6_3_1_LandAreasNotInOtherUse
Juncal/(Juncus sp.)	6_3_1_LandAreasNotInOtherUse
Cornejo/(Cornus sp.)	6_3_1_LandAreasNotInOtherUse
Lentisco/(Pistacia lentiscus)	6_3_1_LandAreasNotInOtherUse
Majuelo/(Crataegus sp.)	6_3_1_LandAreasNotInOtherUse
Otabera/(Genista occidentalis)	6_3_1_LandAreasNotInOtherUse
Zumaque/(Rhus coriaria)	6_3_1_LandAreasNotInOtherUse
Arce (Acer sp.)	6_3_1_LandAreasNotInOtherUse
Aliso (Alnus sp.)	6_3_1_LandAreasNotInOtherUse
Madroño (Arbutus unedo)	6_3_1_LandAreasNotInOtherUse
Abedul (Betula celtiberica, B.pendula)	6_3_1_LandAreasNotInOtherUse
Avellano (Corylus avellana)	6_3_1_LandAreasNotInOtherUse
Carpe (Carpinus betulus)	6_3_1_LandAreasNotInOtherUse
Espino (Crataegus sp.)	6_3_1_LandAreasNotInOtherUse
Castaña (Castanea sativa)	6_3_1_LandAreasNotInOtherUse
Fresno de hoja estrecha (Fraxinus angustifolia)	6_3_1_LandAreasNotInOtherUse
Fresno común (Fraxinus excelsior)	6_3_1_LandAreasNotInOtherUse
Haya (Fagus sylvatica)	6_3_1_LandAreasNotInOtherUse
Acebo (Ilex aquifolium)	6_3_1_LandAreasNotInOtherUse
Labiérnago (Phillyrea sp.)	6_3_1_LandAreasNotInOtherUse
Plátano (Platanus hybrida)	6_3_1_LandAreasNotInOtherUse
Chopo y álamo (Populus sp.)	6_3_1_LandAreasNotInOtherUse
Quejigo (Quercus faginea)	6_3_1_LandAreasNotInOtherUse
Encina (Quercus ilex)	6_3_1_LandAreasNotInOtherUse
Roble pubescente (Quercus pubescens)	6_3_1_LandAreasNotInOtherUse
Roble albar (Quercus petraea)	6_3_1_LandAreasNotInOtherUse
Marojo (Quercus pyrenaica)	6_3_1_LandAreasNotInOtherUse
Roble pedunculado (Quercus robur)	6_3_1_LandAreasNotInOtherUse
Carrasca (Quercus rotundifolia)	6_3_1_LandAreasNotInOtherUse
Roble americano (Quercus rubra)	6_3_1_LandAreasNotInOtherUse
Acacia (Robinia pseudoacacia)	6_3_1_LandAreasNotInOtherUse
Sauce (Salix sp.)	6_3_1_LandAreasNotInOtherUse
Tamariz (Tamarix sp.)	6_3_1_LandAreasNotInOtherUse
Tilo (Tilia platyph)	6_3_1_LandAreasNotInOtherUse
Olmo (Ulmus sp.)	6_3_1_LandAreasNotInOtherUse
Serbal (Sorbus sp.)	6_3_1_LandAreasNotInOtherUse
Cerezo (Prunus sp.)	6_3_1_LandAreasNotInOtherUse
Nogal (Juglans regia)	6_3_1_LandAreasNotInOtherUse
Avellano/Hazlenut	6_3_1_LandAreasNotInOtherUse
Chopera/Poplar	6_3_1_LandAreasNotInOtherUse
Árbol del paraíso (Eleagnus angustifolia)	6_3_1_LandAreasNotInOtherUse
Almez (Celtis australis)	6_3_1_LandAreasNotInOtherUse
Abeto blanco (Abies alba)	6_3_1_LandAreasNotInOtherUse
Cedro (Cedrus sp.)	6_3_1_LandAreasNotInOtherUse
Ciprés de Lawson (Chamaecyparis lawsoniana)	6_3_1_LandAreasNotInOtherUse
Ciprés (Cupressus sp.)	6_3_1_LandAreasNotInOtherUse
Enebro común (Juniperus communis)	6_3_1_LandAreasNotInOtherUse
Enebro de la miera (Juniperus oxycedrus)	6_3_1_LandAreasNotInOtherUse
Sabina negra (Juniperus phoenicea)	6_3_1_LandAreasNotInOtherUse
Alerce (Larix sp.)	6_3_1_LandAreasNotInOtherUse
Abeto rojo (Picea abies)	6_3_1_LandAreasNotInOtherUse
Pino banksiana (Pinus banksiana)	6_3_1_LandAreasNotInOtherUse
Pino carrasco (Pinus halepensis)	6_3_1_LandAreasNotInOtherUse
Abeto Douglas (Pseudotsuga menziesii)	6_3_1_LandAreasNotInOtherUse
Pino laricio (Pinus nigra)	6_3_1_LandAreasNotInOtherUse
Pino piñonero (Pinus pinea)	6_3_1_LandAreasNotInOtherUse
Pino insigne (Pinus radiata)	6_3_1_LandAreasNotInOtherUse
Pino silvestre (Pinus sylvestris)	6_3_1_LandAreasNotInOtherUse

INSPIRE	Reference: D2.8.III.4_v2.9		
TWG-LU	Data Specification on <i>Land Use</i>	2012-02-23	Page 177

Picea de Sitka (Picea sitchensis)	6_3_1_LandAreasNotInOtherUse
Pino estrobus (Pinus strobus)	6_3_1_LandAreasNotInOtherUse
Pino negro (Pinus uncinata)	6_3_1_LandAreasNotInOtherUse
Tejo (Taxus baccata)	6_3_1_LandAreasNotInOtherUse
Sequoia (Sequoia sempervirens)	6_3_1_LandAreasNotInOtherUse
Criptomeria (Cryptomeria japonica)	6_3_1_LandAreasNotInOtherUse
Cursos de agua / Water courses	6_3_2_WaterAreasNotInOtherUse
Lagos y lagunas / Lakes and lagoons	6_3_2_WaterAreasNotInOtherUse
Embalse / Reservoir	6_3_2_WaterAreasNotInOtherUse
Balsa de riego/irrigation pool	6_3_2_WaterAreasNotInOtherUse
Edificación / Buildings	6_6_NotKnownUse
Lámina de agua artificial / Artificial water body	6_6_NotKnownUse
Otras construcciones / Other constructions	6_6_NotKnownUse
Suelo no edificado / Non-built soil	6_6_NotKnownUse
Zonas de extracción o vertido / Extraction and dumping	6_6_NotKnownUse

INSPIRE	Reference: D2.8.III.4_v2.9		
TWG-LU	Data Specification on <i>Land Use</i>	2012-02-23	Page 178

Annex D (informative) Hierarchical Supplementary Regulation Code List

D.1 Introduction

During the consultation process, comments have been provided related to the possible values for the attribute supplementaryRegulation. In the testing material, CZ, FR and DE provided files showing the matching between national code list and the list provided in the LU data specification version 2.0. The analysis of the testing report also provides other input and the code list associated with the attribute zoneTypeCode of the feature ManagementRestrictionOrRegulationZone in the AM data specification influences the list philosophy.

The next section provides the first draft of the future INSPIRE Hierarchical supplementary Regulation code list provided in this LU data specification.

Three entries from the AM data specification have been set aside (riverBasinDistrict³¹, marineRegion³² and animalHealthRestrictionZone³³) as not being perceived as a supplementary regulation.

Two main categories of supplementary regulation can be defined from the current list:

- Supplementary regulation that is imported in the spatial plan from regulations that externally condition the spatial plan often due to legislations other than spatial planning laws (1_ImpactOnEnvironment, 2_RiskExposure, 3_HeritageProtection, 4_GeneralInterest)
- Supplementary regulation that is defined within the spatial plan by the competent authority responsible for the spatial plan (5_LandPropertyRight, 6_RegulationsOnBuildings, 7_LocalRegionalStateDevelopmentPolicies, 8_SocialHealthChoices, 9_RegulatedActivities)

A last category 10_OtherSupplementaryRegulation is provided in order to enable room for supplementary regulation types that has not been foreseen.

Supplementary regulation that is inherited from spatial plan that have legal precedence (e.g. area of a zoning plan where restrictions are imposed by a structure plan) (previously 10_PlansWithLegalPrecedence in LU-DS 2.0) is now seen as a qualifier for any supplementary regulation. In the PLU data model a boolean attribute of the feature type "SupplementaryRegulation" called "inheritedFromPlanWithLegalPrecedence" implements the qualifier.

³¹ Area of land and sea, made up of one or more neighbouring river basins together with their associated ground waters and coastal waters, identified under Article 3(1) as the main unit for management of river basins.

SOURCE: Art 2 (15) of DIRECTIVE 2000/60/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 23 October 2000 establishing a framework for Community action in the field of water policy.

³² Marine regions and their subregions are sea regions designated for the purpose of assessment, management and regulation.

For each Marine Region a marine strategy shall be developed and implemented to maintain and improve good environmental status.

SOURCE: Marine Strategy Framework Directive (2008/56/EC).

³³ Restriction zones established for the control and eradication of notifiable animal diseases

EXAMPLE: Bluetongue Restriction Zones (Council Directive 2000/75/EC).

EXAMPLE: Avian Influenza Restriction Zones (Council Directive 2005/94/EC).

EXAMPLE: African Horse Sickness (Council Directive 92/35/EEC).

D.2 Proposed Hierarchical Supplementary Regulation Code List (HSRCL)

The code list is provided in section 5.2.7.2

D.3 Examples of mapping HSRCL with national coding systems

This section is a contribution of the experts of the TWG-LU. IT is their vision of how national code lists could be mapped with HSRCL. Note that the national terminology is kept in the national language as well as the definition of terms where applicable.

• Mapping with CNIG (France) code list

Value	Code	Definition	SupplementaryRegulationValue
PrescriptionUrbaType		Nature de la contrainte imposée par une prescription figurant dans un document d'urbanisme	
espace boisé classé (R123-11 a)	1	.	1.4.3
secteur avec limitation de la constructibilité ou de l'occupation pour des raisons de nuisances ou de risques (R123-11b)	2	Secteurs où les nécessités du fonctionnement des services publics, de l'hygiène, de la protection contre les nuisances et de la préservation des ressources naturelles ou l'existence de risques naturels, tels que inondations, incendies de forêt, érosion, affaissements, éboulements, avalanches, ou de risques technologiques justifient que soient interdites ou soumises à des conditions spéciales les constructions et installations de toute nature, permanentes ou non, les plantations, dépôts, affouillements, forages et exhaussements des sols	2.
secteur avec disposition de reconstruction /démolition (R123-1 10 et R123-11 f)	3	Secteurs dans lesquels la délivrance du permis de construire peut être subordonnée à la démolition de tout ou partie des bâtiments existants sur le terrain où l'implantation de la construction est envisagée	5.4
périmètre issu des PDU sur obligation de stationnement (R123-11 g)	4	Périmètres, tels que délimités par le plan de déplacements urbains en application de l'article 28-1-2 de la loi n°82-1153 du 30 décembre 1982 modifiée, à l'intérieur desquels les conditions de desserte par les transports publics réguliers permettent de réduire ou de supprimer les obligations imposées en matière de réalisation d'aires de stationnement, notamment lors de la construction d'immeubles de bureaux, ou à l'intérieur desquels le plan local d'urbanisme fixe un nombre maximum d'aires de stationnement à réaliser lors de la construction de bâtiments à usage autre que d'habitation	7.5.2
emplacement réservé (L123-1 8 et R123-11 d)	5	Emplacements réservés aux voies et ouvrages publics, aux installations d'intérêt général et aux espaces verts, en précisant	7.3

		leur destination et les collectivités, services et organismes publics bénéficiaires	
secteur à densité maximale pour les reconstructions ou aménagements de bâtiments existants (L123-1-5 et R123-11 e)	6	Secteurs dans lesquels, pour des motifs d'urbanisme ou d'architecture, la reconstruction sur place ou l'aménagement de bâtiments existants peut être imposé ou autorisé avec une densité au plus égale à celle qui existait antérieurement, nonobstant le ou les coefficients d'occupation du sol fixés pour la zone ou le secteur	6.7
élément de paysage (bâti et espaces), de patrimoine, point de vue à protéger, à conserver (L123-1 9 et R123-11 h)	7	Éléments de paysage, les quartiers, îlots, immeubles, espaces publics, monuments, sites et secteurs à protéger ou à mettre en valeur pour des motifs d'ordre culturel, historique ou écologique, et notamment les secteurs dans lesquels la démolition des immeubles est subordonnée à la délivrance d'un permis de démolir	3.
terrain cultivé à protéger en zone urbaine (L123-1 9 et R123-12 1a)	8	Terrains cultivés à protéger et inconstructibles délimités en application du 9° de l'article L. 123-1	1.4.4
emplacement réservé logement social/mixité sociale (L123-2b et R123-12 1c)	9	Emplacements réservés en application du b de l'article L. 123-2 en vue de la réalisation, dans le respect des objectifs de mixité sociale, de programmes de logements en précisant la nature de ces programmes	8.2
pré-emplacement réservé pour des équipements (R123-11 d)	10	Terrains concernés par la localisation des équipements mentionnés au d de l'article L. 123-2	5.6
limitations particulières d'implantation des constructions (bande constructible, marge de recul, zone non aedificandi, alignement, emprise de construction...)	11	Règles d'implantation issues de sources telles que les règlements de ZAC, les règles de réciprocité...	6.
secteur de projet en attente d'un projet d'aménagement global (R123-2 a et R123-12 1b)	12	Secteurs délimités en application du a de l'article L. 123-2 en précisant à partir de quelle surface les constructions ou installations sont interdites et la date à laquelle la servitude sera levée	7.4
zone à aménager en vue de la pratique du ski (L123-1 6 et R123-11 i)	13	Zones qui sont ou peuvent être aménagées en vue de la pratique du ski et les secteurs réservés aux remontées mécaniques en indiquant, le cas échéant, les équipements et aménagements susceptibles d'y être prévus	7.2.3
secteur de plan de masse (R123-12 4)	14	Secteurs pour lesquels un plan de masse coté à trois dimensions définit des règles spéciales	6.3
règles d'implantation des constructions par rapport aux voies et limites séparatives (R123-9 6° et 7°, et R123-11)	15	Implantation des constructions par rapport aux voies, emprises publiques et limites séparatives (R123-9 et R123-11)	6.1

bâtiment agricole susceptible de changer de destination (R123-12 2)	16	Bâtiments agricoles qui, en raison de leur intérêt architectural ou patrimonial, peuvent faire l'objet d'un changement de destination, dès lors que ce changement de destination ne compromet pas l'exploitation agricole	3.3
secteur à programme de logements mixité sociale en Zone U et AU et secteur soumis à un quota de logements locatifs (L123-1 16 et L123-2 d)	17	Secteurs délimités en application du d de l'article L. 123-2 dans lesquels, en cas de réalisation d'un programme de logements, un pourcentage de ce programme doit être affecté à des catégories de logements locatifs qu'il définit dans le respect des objectifs de mixité sociale	8.1
secteur comportant des orientations d'aménagement (L123-1 et R123-3 1)	18	Les orientations d'aménagement peuvent, par quartier ou par secteur, prévoir les actions et opérations d'aménagement	7.6
secteur protégé en raison de la richesse du sol et du sous-sol	19	Secteurs protégés en raison de la richesse du sol ou du sous-sol, dans lesquels les constructions et installations nécessaires à la mise en valeur de ces ressources naturelles sont autorisées	7.2.7
secteur à transfert de COS en zone N (L123-4 et R123-12 3)	20	Secteurs protégés en raison de la qualité de leur paysage où est applicable le transfert des possibilités de construction prévu à l'article L. 123-4	3.2
terrain concerné par la localisation d'équipements en zone U, voies, ouvrages publics, espaces verts (L123-2c et R123-12 1d)	21	Localisation et caractéristiques des voies et ouvrages publics, ainsi que les installations d'intérêt général et les espaces verts à créer ou à modifier (L123-2c et R123-12 1d)	4.2
secteur de diversité commerciale à protéger (L123-1 7bis)	22	Secteur délimitant les quartiers, îlots, voies dans lesquels doit être préservée ou développée la diversité commerciale, notamment à travers les commerces de détail et de proximité (L123-1-7bis)	7.1.3.2
secteur avec taille minimale des logements en zone U et AU (L123-1 15)	23	Secteurs, dans les zones urbaines ou à urbaniser, pour lesquels les programmes de logements doivent comporter une proportion de logements d'une taille minimale (L123-1-15)	6.8
voies, chemins, transport public à conserver et à créer (L123-1 6)	24	Localisation et caractéristiques des voies de circulation à conserver, à modifier ou à créer (L123-1-6)	7.3.1.1
autre	99		10.
InformationUrbaType		Nature du périmètre d'information figurant dans un document d'urbanisme	
secteur sauvegardé (L313-1 et R123-13 1)	1	Secteurs sauvegardés, délimités en application des articles L. 313-1 et suivants	3.
zone d'aménagement concerté (R123-13 2)	2	Zones d'aménagement concerté ZAC	7.4.1
zone de préemption dans un espace naturel et sensible (R123-13 3)	3	Zones de préemption délimitées en application de l'article L. 142-1 dans sa rédaction antérieure à la loi n°85-729 du 18 juillet 1985 relative à la définition et à la mise en oeuvre de principes d'aménagement et de l'article L. 142-3 dans sa rédaction issue de la même loi	3.1

périmètre de droit de préemption urbain (R123-13 4)	4	Périmètres à l'intérieur desquels s'applique le droit de préemption urbain défini par les articles L. 211-1 et suivants	5.2
zone d'aménagement différé (R123-13 4)	5	Périmètres provisoires ou définitifs des zones d'aménagement différé ZAD	7.4.2
zone d'obligation du permis de démolir (R123-13 5)	6	Zones délimitées en application de l'article L. 430-1 à l'intérieur desquelles s'appliquent les dispositions relatives au permis de démolir prévues aux articles L. 430-2 et suivants	7.5.3
périmètre de développement prioritaire économie d'énergie (R123-13 6)	7	Périmètres de développement prioritaires délimités en application de la loi n°80-531 du 15 juillet 1980 relative aux économies d'énergie et à l'utilisation de la chaleur	7.5.4
périmètre forestier : interdiction ou réglementation des plantations (code rural), plantations à réaliser (R123-13 7)	8	Périmètres d'interdiction ou de réglementation des plantations et semis d'essences forestières, les périmètres d'actions forestières et les périmètres de zones dégradées à faible taux de boisement, délimités en application des 1 ^o , 2 ^o et 3 ^o de l'article L. 126-1 du code rural	1.4.3
périmètre minier de concession pour l'exploitation ou le stockage (R123-13 8)	9	Périmètres miniers définis en application des titres II, III et V du livre Ier du code minier	7.2.7.1
zone de recherche et d'exploitation de carrière (R123-13 9)	10	Périmètres de zones spéciales de recherche et d'exploitation de carrières et des zones d'exploitation et d'aménagement coordonné de carrières, délimités en application des articles 109 et 109-1 du code minier	7.2.7.1
périmètre des zones délimitées - divisions foncières soumises à déclaration préalable (R123-13 10)	11	Périmètres des zones délimitées en application de l'article L. 111-5-2 à l'intérieur desquelles certaines divisions foncières sont soumises à déclaration préalable	5.3
périmètre de sursis à statuer (R123-13 11)	12	Périmètres à l'intérieur desquels l'autorité compétente peut surseoir à statuer sur les demandes d'autorisation en application de l'article L. 111-10	7.5
secteur de programme d'aménagement d'ensemble (R123-13 12)	13	Périmètres des secteurs dans lesquels un programme d'aménagement d'ensemble a été approuvé en application de l'article L. 332-9	7.4.3
périmètre de voisinage d'infrastructure de transport terrestre (R123-13 12)	14	Périmètres des secteurs situés au voisinage des infrastructures de transports terrestres, dans lesquels des prescriptions d'isolement acoustique ont été édictées en application de l'article L. 571-10 du code de l'environnement	6.2
zone agricole protégée (R123-14 8)	15	Zones agricoles protégées délimitées en application de l'article L. 112-2 du code rural	1.4.4

site archéologique	16	Sites contenant des vestiges archéologiques concernés par le décret n°2004-490 relatif aux procédures administratives et financières en matière d'archéologie préventive – art. 1 : « les opérations d'aménagement, de construction d'ouvrages ou de travaux qui, en raison de leur localisation, de leur nature ou de leur importance, affectent ou sont susceptibles d'affecter des éléments du patrimoine archéologique ne peuvent être entreprises que dans le respect de détection et, le cas échéant, de conservation et de sauvegarde par l'étude scientifique ainsi que des demandes de modification de la consistance des opérations.	3.4
zone à risque d'exposition au plomb (R123-13 14)	17	Périmètres des zones à risque d'exposition au plomb	2.2.1
zone humide (L 146-6 et R 146-1)	18	Espaces et milieux à préserver en fonction de l'intérêt écologique qu'ils présentent : les marais, les vasières, les zones humides et milieux temporairement immergés... (L 146-6 et R 146-1)	1.4.5
zone d'assainissement collectif / non collectif / eaux usées/eaux pluviales, schéma de réseaux eau et assainissement, systèmes d'élimination des déchets (L123-1 11 et R123-14 3)	19	Schémas de réseaux eau et zonages assainissement, systèmes d'élimination des déchets existants ou en cours de réalisation, en précisant les emplacements retenus pour le captage, le traitement et le stockage des eaux destinées à la consommation, les stations d'épuration des eaux usées et le stockage et le traitement des déchets (R123-14 3)	7.3.3
Zone de Protection Rapprochée-ZPétendue (R123-14 6)	20	Zones de publicité restreinte, zones de publicité élargie (R123-14 6)	2.2.4
projet de PPRN et PPRM (R123-14 7)	21	Projet de plan de prévention des risques naturels prévisibles en application de l'article L. 562-2 du code de l'environnement et les dispositions d'un projet de plan de prévention des risques miniers établi en application de l'article 94 du code minier (R123-14 7)	2.
protection des rives des plans d'eau en zone de montagne (L146-6 et R146-1)	22	Les parties naturelles des rives des plans d'eau naturels ou artificiels d'une superficie inférieure à mille hectares sont protégées sur une distance de trois cent mètres à compter de la rive ; y sont interdits toutes constructions, installations et routes nouvelles ainsi que toutes extractions et tous affouillements (L146-6 et R146-1)	1.6
arrêté du préfet coordonnateur de massif/zone unités touristiques nouvelles en zone de montagne (L145-5 et R123-14 9)	23	Par exception aux dispositions de l'alinéa précédent, des constructions et aménagements peuvent être admis, en fonction des spécificités locales, dans certains secteurs délimités avec l'accord du préfet, après avis de la commission départementale compétente en matière de nature, de paysages et de sites, et au vu d'une étude justifiant que l'aménagement et l'urbanisation de ces secteurs sont compatibles avec la prise en compte de la qualité de l'environnement et des paysages (R123-14 9 -	1.7

		L145-5)	
document d'aménagement commercial (L123-1)	24	Dans les cas visés au cinquième alinéa du II de l'article L. 752-1 du code de commerce, les plans locaux d'urbanisme peuvent comporter le document d'aménagement commercial	7.2.
périmètre de protection des espaces agricoles et naturels péri-urbains (L143-1 et R123-13 15)	25	Les périmètres d'intervention pour la protection et la mise en valeur des espaces agricoles et naturels péri-urbains permettent l'élaboration et la mise en oeuvre d'un programme d'actions qui précise des aménagements et des orientations de gestion des espaces agricoles, forestiers, naturels, paysagers.	1.4.4
lotissement (R123-14 2 et L 315-2-1)	26	Périmètres des lotissements dont les règles d'urbanisme ont été maintenues en application du deuxième alinéa de l'article L. 315-2-1	7.1.3.1
plan d'exposition au bruit des aéroports (L147-1 à L147-6 et R123-13 4)	27	Plan d'exposition au bruit des aéroports (PEB A)	1.1
autre	99		10.

- Mapping with (Finland) code list

Kaavamerkintäpäätöksen

mukaiset

maakuntakaavamerkinnät,

jotka voisi tulkita ns.

Supplementary regulation

merkintä

kaava

Supplementary Regulation

SR2

kulttuuriympäristön tai
 maiseman vaalimisen kannalta
 tärkeä alue
 arvokas harjualue tai muu
 geologinen muodostuma
 tärkeä vedenhankintaan
 soveltuva alue
 natura 2000 verkostoon
 kuuluva tai ehdotettu alue
 luonnon monimuotoisuuden
 kannalta erityisen tärkeä alue
 UNESCO:n
 maailmanperintökohde
 kansallinen kaupunkipuisto
 melualue (esim. lentomelualue)
 vaara-alue
 suojavyöhyke
 tuulivoimaloiden alue
 kaupunkikehittämisen
 kohdealue
 maaseudun kehittämisen

3

3

1

1

3

3

2

2

2

9

7

7

INSPIRE	Reference: D2.8.III.4_v2.9		
TWG-LU	Data Specification on <i>Land Use</i>	2012-02-23	Page 185

kohdealue			
matkailun vetovoima-			
alue/matkailun ja virkistys-			
kehittämisen kohdealue		7	
selvitysalue		7	
yhdyskuntarakenteen			
laajenemissuunta		7	
yhdyskuntarakenteen			
eheyttämistarve		7	
ohjeellinen/vaihtoehtoinen			
tielinjaus		7	
tieliikenteen yhteystarve		7	
joukkoliikenteen			
kehittämiskäytävä/yhteystarve		7	
viheralue		1	7

Muut merkinnät	merkintä	kaava	
Vedenhankinnan kannalta tärkeä/arvokas			
vesialue/vedenhankinta-alue	av	m01001	m01002
Alueet, joilla maakuntakaavan osoittaman pääkäyttötarkoituksen lisäksi voidaan kehittää loma-asutusta alueella olevilla rakennuspaikoilla	ra	m01001	7
Rannikon mannervyöhyke ja sisäsaaristo	vz1	m01001	10
Ulkosaaristo	vz2	m01001	10
Merivyöhyke	vz3	m01001	10
Kehäkaupungin kehittämissvyöhyke		m01002	7
Maankäytön kehittämiseen kohdelaue liikenteellisessä solmukohdassa			7
alue, jolla sijaitsee merkittäviä kiviainesvaroja		m01003	aluevaraus?
luontoarvoltaan merkittävä osa-alue/kohde (luonto/maisema/vesiensuojelu)		m03001	1
osa-alueet, joiden suojeltavista rakennetun ympäristön kokonaisuuksista on erillislue		m03002	
merkittävä rakennetun ympäristön kokonaisuus / -ryhmä / -alue	sr/srr/sra	m03003	7
muinaisjäännösalue/kohde		m03003	3
raideliikenteen tukeutuva taajamatoimintojen kehittämisen alue		m03004	7
Selkämeren kalastuksen ja kalatalouden kehittämisyöhyke		m03004	7
Saariston regastiehen tukeutuva kehittämisyöhyke		m03004	7
Saaristomeren yhteistoiminta-alueen kehittämissvyöhyke		m03004	7

INSPIRE	Reference: D2.8.III.4_v2.9		
TWG-LU	Data Specification on <i>Land Use</i>	2012-02-23	Page 186

Puolustusvoimien melualue		m03004	2	
Suoja- tai konsultintivyöhyke		m03004	2	
Pintaveden muodustumisalue		m03004		
Tuulivoiman selvitysalue		m03004	9	???
Vedenhankinnan kannalta tärkeä pohjavesialue		m05001		
Teknisen huollon kehittämisen kohdealue	tk1, tk3	m05001	7	
Maaseutuelinkeinojen kehittämisen kohdealue	mk1	m05001	7	
Maaseutuasumisen kehittämisen kohdealue	mk2	m05001	7	
Maankäytön kehittämisen kohdealue liikenteellisessä solmukohdassa	ls	m05001	7	
Raideliikenteen hyödyntämisen kohdealue	ls	m05001	7	
Matkailun kehittämisen kohdealue	mv	m05001	7	
Kultuuri- ja maisemamatkailun kehittämisen kohdealue	mvk	m05001	7	
Luontomatkailun kehittämsen kohdealue	lmk	m05001	7	
Turvetuotannon kannalta tärkeä vyöhyke	EO/tu	m05002		päällekkäin M-alueiden kanssa
Valuma-alue, jolla turvetuotanto suunniteltaessa on kiinnitettävä erityistä huomiota toiminnan vesistö- ja kalatalousvaikutuksiin	tu-1	m05002		
Rajapelvelujen kehittämisalue	rk	m08001	7	
Konsultointivyöhyke, Seveso II-direktiivi	sev	m08001	2	
Salpalinja		m08001		
Osa-alue, jolla on ajoittain puolustusvoimien harjoitustoimintaa	eph	m08002		
Alue, jolla kulkeminen on rajoitettu		m08002		
Huom! W = vedenhankinnan kannalta arvokas pinta-alue (päällekkäin muiden kohteiden kanssa)	W	m08002		
Muinaismuistovyöhyke	smv	m09001		
Rantasuojeluohjelman alue	rso	m09001	3	
Tuotannon ja palveluiden kehittämisen kohdealue	tpk	m09001	3	
Rekennuskivituotannon ja -palveluiden kehittämisen kohdealue	tpk-1	m09001	7	
Kehitettävä vesialue	W-1	m09001		
Suur-Saimaan kehittämisen kohdealue	sai	m09001	7	
liikenteen ja logistiikan kehittämisen kohdealue	tlk	m09001	7	
Rantojensuojeluohjelman alue	rso	m09001	3	
Muinaismuistovyöhyke	smv	m09001	3	
Vuoken rantojen kehittämisen	Vk	m09001	7	

INSPIRE	Reference: D2.8.III.4_v2.9		
TWG-LU	Data Specification on <i>Land Use</i>	2012-02-23	Page 187

kohdealue

tulivoimaloiden alue tv m09001 tässä kuten osa-alue

rantojen käytön kehittämisen

kohdealue rk, rk-1 m11001 7

koskiensuojelualue m11001 3

erämatkailualue, ohjeellinen

rajaus rme m12001 3

Lentoliikenteen erityisalue,

ohjeellinen rajaus el m12002

vesimatkailun kehittämisa-alue m12002 7

hiljainen alue hil m12002

logistiikan kehittämisen m12004:sta puuttuu

kohdealue lk m13001 legenda 7

puuteknologian kehittämisen

kohdealue pk m13001 myös W 7

maa-aineisten ottovyöhyke eo/1 m13003

teollisuuden kehittämisen

kohdealue tk m14001 7

erityissuojelua vaativa vestistö m14001

kalliokiviainesten ottoalue m14002

jokilaaksojen kehittäminen m15001 7

strandzon m15001

vattenområde, som ämnar sig

för paddling m15001

kansainvälinen

kehittämisyöhyke m17001 7

kaupunki-maaseutu

vuorovaikutusalue mk m17001 7

luonnon monikäyttöalue m17001

turvetuotantosoiden jälkikäytön

kehittämiseen soveltuva alue tjk m17001 7

avokas vesistö av m17001

poronhoitoalue m17001

en-tv = tuulivoima-alue....

m18001 puuttuu legenda

kyläalue ja sen ohjeellinen

laajentumisalue at m19001 7

rantojen suojelualue sr m19001 3

harjujen suojelualue sh m19001 3

Barentsin käytävä

todennäköinen bk m19002

mineraalivarantoalue ek1 m19002

saamelaisten kotiseutualue sai m19004

kolttala-alue ka m19004

erityisesti poronhoitoa varten

tarkoitettua alueen raja m19004 W-1 Merkinnällä osoitetaan sähkövoiman tuotantoon rakennettuja tekojärviä, jotka on rajattu ylävesirajan mukaan

ydinvoimalaitoksen

suojava-alue sv-1 m19005

luontaiselinkeinola-alue mukainen

raja lt m19007

• Mapping supplementary regulation in Germany with XPlanGML standard

XPlanGML class	SupplementaryRegulationValue
BP_AufschuettungsFlaeche	10_OtherSupplementaryRegulation
FP_AufschuettungsFlaeche	10_OtherSupplementaryRegulation

BP_AbgrabungsFlaeche	10_OtherSupplementaryRegulation
FP_AbgrabungsFlaeche	10_OtherSupplementaryRegulation
BP_BodenschaetzeFlaeche	10_OtherSupplementaryRegulation
FP_BodenschaetzeFlaeche	10_OtherSupplementaryRegulation
BP_RekultivierungsFlaeche	10_OtherSupplementaryRegulation
BP_BesondererNutzungszweckFlaeche	10_OtherSupplementaryRegulation
BP_PersGruppenBestimmteFlaeche	8_2_PubliclySubsidisedHousingArea
BP_GebaeudeFlaeche	10_OtherSupplementaryRegulation
BP_FoerderungsFlaeche	8_2_PubliclySubsidisedHousingArea
BP_FirstRichtungsLinie	6_RegulationsOnBuildings
BP_BauLinie	6_1_BuildingLine
BP_BauGrenze	6_1_BuildingLine
BP_UeberbaubareGrundstuecksFlaeche	5_1_UsableBuildingArea
BP_AbstandsFlaeche	6_3_SpatialDesign
BP_SpezielleBauweise	6_3_SpatialDesign
typ	
Durchfahrt	6_3_SpatialDesign
Durchgang	6_3_SpatialDesign
DurchfahrtDurchgang	6_3_SpatialDesign
Auskragung	6_3_SpatialDesign
Arkade	6_3_SpatialDesign
Luftgeschoss	6_3_SpatialDesign
Sonstiges	6_3_SpatialDesign
BP_NebenanlagenFlaeche	6_4_SecondaryStructuraArea
zweckbestimmung	
Stellplaetze	6_4_SecondaryStructuraArea
Garagen	6_4_SecondaryStructuraArea
Spielplatz	6_4_SecondaryStructuraArea
Carport	6_4_SecondaryStructuraArea
Tiefgarage	6_4_SecondaryStructuraArea
Nebengebäude	6_4_SecondaryStructuraArea
AbfallSammelanlagen	6_4_SecondaryStructuraArea
EnergieVerteilungsanlagen	6_4_SecondaryStructuraArea
AbfallWertstoffbehälter	6_4_SecondaryStructuraArea
Sonstiges	6_4_SecondaryStructuraArea
BP_NebenanlagenAusschlussFlaeche	
typ	6_4_SecondaryStructuraArea
Einschraenkung	6_4_SecondaryStructuraArea
Ausschluss	6_4_SecondaryStructuraArea
BP_GemeinschaftsanlagenFlaeche	6_5_CollectiveFacility
zweckbestimmung	
Gemeinschaftsstellplaetze	6_5_CollectiveFacility
Gemeinschaftsgaragen	6_5_CollectiveFacility

Spielplatz	6_5_CollectiveFacility
Carport	6_5_CollectiveFacility
GemeinschaftsTiefgarage	6_5_CollectiveFacility
Nebengebäude	6_5_CollectiveFacility
AbfallSammelanlagen	6_5_CollectiveFacility
EnergieVerteilungsanlagen	6_5_CollectiveFacility
AbfallWertstoffbehälter	6_5_CollectiveFacility
Freizeiteinrichtungen	6_5_CollectiveFacility
Laerschutzanlagen	6_5_CollectiveFacility
AbwasserRegenwasser	6_5_CollectiveFacility
Ausgleichsmassnahmen	6_5_CollectiveFacility
Sonstiges	6_5_CollectiveFacility
BP_GemeinschaftsanlagenZuordnung	6_5_CollectiveFacility
FP_KeineZentrale	10_OtherSupplementaryRegulation
AbwasserBeseitigungFläche	
BP_ErhaltungsbereichFläche	
grund	
StädtebaulicheGestalt	3_3_BuiltHeritageProtection
Wohnbevölkerung	8_1_CompositionOfLocalResidentialPopulation
Umstrukturierung	8_1_CompositionOfLocalResidentialPopulation
BP_DenkmalchutzEnsembleFläche	4_1_6_Historic_preservation_easement
BP_DenkmalchutzEinzelanlage	4_1_6_Historic_preservation_easement
FP_Gemeinbedarf	10_OtherSupplementaryRegulation
FP_SpielSportanlage	10_OtherSupplementaryRegulation
FP_Gruen	10_OtherSupplementaryRegulation
BP_Schutzgebiet	3_HeritageProtection
zweckbestimmung	
Naturschutzgebiet	1_4_NatureProtection
Nationalpark	1_4_NatureProtection
Biosphaerenreservat	1_4_2_BiodiversityReservoir
Landschaftsschutzgebiet	3_2_LandscapeAreaProtection
Naturpark	3_1_2_GeodiversityProtection
Naturdenkmal	3_1_NaturalHeritageProtection
GeschützterLandschaftsBestandteil	3_2_LandscapeAreaProtection
GesetzlichGeschütztesBiotop	3_1_1_BiodiversityProtection
Natura2000	1_4_NatureProtection
GebietGemeinschaftlicher- Bedeutung	1_4_NatureProtection
EuropäischesVogelschutzgebiet	1_4_NatureProtection
NationalesNaturmonument	3_2_LandscapeAreaProtection
Sonstiges	3_HeritageProtection
SO_SchutzgebietNaturschutzrecht	3_HeritageProtection

artDerFestlegung	
Naturschutzgebiet	1_4_NatureProtection
Nationalpark	1_4_NatureProtection
Biosphaerenreservat	1_4_2_BiodiversityReservoir
Landschaftsschutzgebiet	3_2_LandscapeAreaProtection
Naturpark	3_1_2_GeodiversityProtection
Naturdenkmal	3_1_NaturalHeritageProtection
GeschuetzterLandschaftsBestandteil	3_2_LandscapeAreaProtection
GesetzlichGeschuetztesBiotop	3_1_1_BiodiversityProtection
Natura2000	1_4_NatureProtection
GebietGemeinschaftlicherBedeutung	1_4_NatureProtection
EuropaeischesVogelschutzgebiet	1_4_NatureProtection
NationalesNaturmonument	3_2_LandscapeAreaProtection
Sonstiges	3_HeritageProtection
BP_SchutzPflege	9_2_PermittedActivities
Entwicklungsmassnahme	
BP_AusgleichsMassnahme	1_8_OtherImpactofEnvironmemt
BP_Anplantation-BindungErhaltung	
BindungErhaltung	3_1_NaturalHeritageProtection
Anplantation	9_2_PermittedActivities
BP_SchutzPflege- EntwicklungsFlaeche	9_2_PermittedActivities
BP_AusgleichsFlaeche	9_2_PermittedActivities
BP_EingriffsBereich	9_2_PermittedActivities
FP_AusgleichsFlaeche	9_2_PermittedActivities
FP_SchutzPflegeEntwicklung	9_2_PermittedActivities
BP_KennzeichnungsFlaeche	10_OtherSupplementaryRegulation
zweckbestimmung	
Naturgewalten	2_RiskExposure
Abbauflaeche	2_3_Mining
AeussereEinwirkungen	2_RiskExposure
SchadstoffBelastBoden	2_2_2_RestrictedZonesAroundContaminatedSites
LaermBelastung	1_1_1_NoiseProtectionArea
Bergbau	2_3_Mining
Bodenordnung	5_3_AreaReservedForRestructuringParcels
AndereGesetzlVorschriften	10_OtherSupplementaryRegulation
FP_Kennzeichnung	10_OtherSupplementaryRegulation
zweckbestimmung	
Naturgewalten	2_RiskExposure
Abbauflaeche	2_3_Mining
AeussereEinwirkungen	2_RiskExposure

SchadstoffBelastBoden	2_2_2_RestrictedZonesAroundContaminatedSites
LaermBelastung	1_1_1_NoiseProtectionArea
Bergbau	2_3_Mining
Bodenordnung	5_3_AreaReservedForRestructuringParcels
AndereGesetzlVorschriften	10_OtherSupplementaryRegulation
BP_Veraenderungssperre	9_3_ForbiddenActivities
BP_FreiFlaeche	9_1_RestrictedActivities
BP_TextlicheFestsetzungsFlaeche	9_2_PermittedActivities
FP_TextlicheDarstellungsFlaeche	9_2_PermittedActivities
BP_AbstandsMass	6_RegulationsOnBuildings
BP_HoehenMass	6_6_BuildingHightRegulation
BP_Wegerecht	4_1_PublicEasement
typ	
Gehrecht	4_1_PublicEasement
Fahrrecht	4_1_PublicEasement
GehFahrrecht	4_1_PublicEasement
Leitungsrecht	4_1_3_UtilityEasement
GehFahrLeitungsrecht	4_1_PublicEasement
BP_GenerischesObjekt	10_OtherSupplementaryRegulation
FP_GenerischesObjekt	10_OtherSupplementaryRegulation
BP_UnverbindlicheVormerkung	10_OtherSupplementaryRegulation
FP_UnverbindlicheVormerkung	10_OtherSupplementaryRegulation
FP_VorbehalteFlaeche	9_1_RestrictedActivities
BP_NutzungsartenGrenze	10_OtherSupplementaryRegulation
FP_PriveligiertesVorhaben	9_4_SuitableActivities
FP_NutzungsbeschraenkungFlaeche	9_1_RestrictedActivities
BP_LuftreinhalteFlaeche	1_2_1_AirQualityManagementZone
BP_ErneuerbareEnergieFlaeche	1_3_RewenableEnergyArea
BP_Immissionsschutz	1_5_ClimateProtection
BP_VerEntsorgung	10_OtherSupplementaryRegulation
FP_VerEntsorgung	10_OtherSupplementaryRegulation
BP_StrassenbegrenzungsLinie	6_2_BoundaryLine
BP_EinfahrtsbereichLinie	9_2_PermittedActivities
BP_BereichOhneEinAusfahrtLinie	9_1_RestrictedActivities
BP_EinfahrtPunkt	9_2_PermittedActivities
BP_Strassenkoerper	10_OtherSupplementaryRegulation
FP_Strassenverkehr	10_OtherSupplementaryRegulation
SO_Strassenverkehrsrecht	10_OtherSupplementaryRegulation
SO_Schienenverkehrsrecht	10_OtherSupplementaryRegulation
SO_Luftverkehrsrecht	10_OtherSupplementaryRegulation
FP_Gewaesser	10_OtherSupplementaryRegulation

FP_Wasserwirtschaft	2_RiskExposure
HochwasserRueckhaltebecken	2_RiskExposure
Ueberschwemmgebiet	2_1_FloodRisks
Versickerungsflaeche	2_RiskExposure
Entwaesserungsgraben	2_RiskExposure
Sonstiges	2_RiskExposure
BP_WasserwirtschaftsFlaeche	2_RiskExposure
HochwasserRueckhaltebecken	2_RiskExposure
Ueberschwemmgebiet	2_1_FloodRisks
Versickerungsflaeche	2_RiskExposure
Entwaesserungsgraben	2_RiskExposure
Sonstiges	2_RiskExposure
SO_Wasserrecht	10_OtherSupplementaryRegulation
Gewaesser1Ordnung	10_OtherSupplementaryRegulation
Gewaesser2Ordnung	10_OtherSupplementaryRegulation
Gewaesser3Ordnung	10_OtherSupplementaryRegulation
Ueberschwemmungsgebiet	2_1_FloodRisks
Festgesetztes-Ueberschwemmungsgebiet	2_1_FloodRisks
NochNichtFestgesetztes-Ueberschwemmungsgebiet	2_1_FloodRisks
UeberschwemmGefaehrdetesGebiet	2_1_FloodRisks
Sonstiges	10_OtherSupplementaryRegulation
SO_SchutzgebietWasserrecht	1_4_3_ProtectedWoodedArea
Wasserschutzgebiet	1_4_3_ProtectedWoodedArea
QuellGrundwasserSchutzgebiet	1_4_3_ProtectedWoodedArea
OberflaechengewaesserSchutzgebiet	1_4_3_ProtectedWoodedArea
Heilquellenschutzgebiet	1_4_3_ProtectedWoodedArea
Sonstiges	1_4_3_ProtectedWoodedArea
SO_Denkmalschutzrecht	3_HeritageProtection
DenkmalschutzEnsemble	3_HeritageProtection
DenkmalschutzEinzelanlage	3_HeritageProtection
Grabungsschutzgebiet	3_HeritageProtection
Sonstiges	3_HeritageProtection
SO_Forstrecht	9_RegulatedActivities
SO_Bodenschutzrecht	2_RiskExposure
SchaedlicheBodenveraenderung	2_RiskExposure
Altlast	2_RiskExposure
Altablagerung	2_RiskExposure
Altstandort	2_RiskExposure
AltstandortAufAltablagerung	2_RiskExposure
SO_SonstigesRecht	9_RegulatedActivities
Bauschutzbereich	6_RegulationsOnBuildings

INSPIRE	Reference: D2.8.III.4_v2.9		
TWG-LU	Data Specification on <i>Land Use</i>	2012-02-23	Page 193

Berggesetz	2_RiskExposure
Richtfunkverbindung	4_GeneralInterest
Truppenuebungsplatz	4_GeneralInterest
Vermessungskatasterrecht	5_LandPropertyRight
Sonstiges	10_OtherSupplementaryRegulation
SO_SchutzgebietSonstRecht	Keine Abbildung
Laerschutzbereich	1_ImpactOnEnvironment
SchutzzoneLeitungstrasse	4_GeneralInterest
Sonstiges	Keine Abbildung
SO_Gebiet	9_RegulatedActivities
Umlegungsgebiet	5_3_AreaReservedForRestructuringParcels
StaedtebaulicheSanierung	7_4_3_UrbanRehabilitationAndRestoration_
StaedtebaulicheEntwicklungsmassnahme	7_4_1_UrbanRenewal_
Stadtumbaugebiet	7_4_2_UrbanRegenerationAndRevitalisation_
SozialeStadt	8_SocialHealthChoices
BusinessImprovementDestrict	9_2_PermittedActivities
HousingImprovementDestrict	9_2_PermittedActivities
Erhaltungsverordnung-StaedtebaulicheGestalt	3_3_BuiltHeritageProtection 9_1_RestrictedActivities
Erhaltungsverordnung-Wohnbevoelkerung	8_1_CompositionOfLocalResidentialPopulation 9_1_RestrictedActivities
Erhaltungsverordnung-Umstrukturierung	9_1_RestrictedActivities
Sonstiges	10_OtherSupplementaryRegulation

- **Mapping supplementary regulation on structure plan level in Germany with XPlanGML standard**

XPlanGML	INSPIRE - SupplementaryRegulation
Klasse	SupplementrayRegulationValue
RP_NaturLandschaft	3_HeritageProtection
xplanNSM:RP_NSM_Naturschutz	
GruenlandBewirtschaftungPflegeEntwicklung	1_4_NatureProtection
Natura2000	1_4_NatureProtection
NaturschutzLandschaftspflege	1_4_NatureProtection
NaturschutzLandschaftspflegeAufGewaessern	1_4_NatureProtection
xplanNSM:RP_NSM_Landschaftsschutz	
VerbesserungLandschaftsstrukturNaturhaushalt	3_2_LandscapeAreaProtection
Biotopverbundachse	3_2_LandscapeAreaProtection
KompensationEntwicklung	3_2_LandscapeAreaProtection

RP_Wasserschutz	
zone	
Zone_1	9_3_ForbiddenActivities
Zone_2	9_1_RestrictedActivities
Zone_3	9_1_RestrictedActivities
zweckbestimmungWA	
Grundwasserschutz	1_6_5_DrinkingWaterProtectionArea
Trinkwasserschutz	1_6_5_DrinkingWaterProtectionArea
Heilquelle	1_6_5_DrinkingWaterProtectionArea
RP_Rohstoffsicherung	7_2_7_1_ProspectingAndMiningPermitArea
xplanNSM:RP_NSM_Oberflaechennahe Bodenschaetze	
xplanNSM:folgenutzung	
Landwirtschaft	7_4_5_Post_Zoning 7_2_1_Agriculture
Forstwirtschaft	7_4_5_Post_Zoning 7_2_2_Forest
Gruenlandberirtschaftung	7_4_5_Post_Zoning
NaturUndLandschaft	7_4_5_Post_Zoning 3_2_LandscapeAreaProtection
Naturschutz	7_4_5_Post_Zoning 1_4_NatureProtection
Erholung	7_4_5_Post_Zoning 7_2_3_Recreation
Sonstiges	7_4_5_Post_Zoning
xplanNSM:zeitstufe	
Zeitstufe_1	7_4_5_Post_Zoning
Zeitstufe_2	7_4_5_Post_Zoning
xplanNSM:RP_NSM_TiefliegendeRohstoffe	7_2_7_RawMaterials
RP_Windenergienutzung	1_3_RewenableEnergyArea
RP_Landwirtschaft	7_1_3_5_Agriculture
AufGrundHohenErtragspotentials	7_1_3_5_Agriculture
AufGrundBesondererFunktionen	7_1_3_5_Agriculture
Fischerei	7_1_3_5_Agriculture
RP_Forstwirtschaft	7_1_3_6_Forestry
Wald	7_1_3_6_Forestry
VergroesserungDesWaldanteils	7_1_3_6_Forestry
VonAuffortungFreizuhaltendesGebiet	7_1_3_6_Forestry
BesondereSchutzfunktionDesWaldes	7_1_3_6_Forestry
RP_FreizeitErholung	7_2_3_Recreation
xplanNSM:RP_NSM_Erholung	
Erholung	7_2_3_Recreation
SchwerpunktbereichErholung	7_2_3_Recreation

KernbereichErholung	7_2_3_Recreation
RuhigeErholungInNaturUndLandschaft	7_2_3_Recreation
ErholungMitStarkerInanspruchnahme DurchBevoelkerung	7_2_3_Recreation
BesondereEntwicklungsaufgabeErholung	7_2_3_Recreation
BesondereEntwicklungsaufgabeTourismus	7_2_3_Recreation
RegionalBedeutsamerErholungsschwerpunkt	7_2_3_Recreation
Erholungswald	7_2_3_Recreation
xplanNSM:RP_NSM_Regional BedeutsameSportanlage	
RegionalBedeutsameSportanlage	7_2_3_Recreation
RegionalBedeutsameSportanlage_Wassersport	7_2_3_Recreation
RegionalBedeutsameSportanlage_Motorsport	7_2_3_Recreation
RegionalBedeutsameSportanlage_Flugsport	7_2_3_Recreation
RegionalBedeutsameSportanlage_Reitsport	7_2_3_Recreation
RegionalBedeutsameSportanlage_Golfsport	7_2_3_Recreation
RegionalBedeutsameSportanlage_Sportzentrum	7_2_3_Recreation
xplanNSM:RP_NSM_Regional BedeutsamerWanderweg	
RegionalBedeutsamerWanderweg	7_3_1_4_OtherNetworkInfrastructure
RegionalBedeutsamerWanderweg_ Radwandern	7_3_1_4_OtherNetworkInfrastructure
RegionalBedeutsamerWanderweg_ Radwandern_geplant	7_3_1_4_OtherNetworkInfrastructure
Fernradweg	7_3_1_4_OtherNetworkInfrastructure
RegionalBedeutsamerWanderweg_Reiten	7_3_1_4_OtherNetworkInfrastructure
RegionalBedeutsamerWanderweg_Wandern	7_3_1_4_OtherNetworkInfrastructure
Fernwanderweg	7_3_1_4_OtherNetworkInfrastructure
RegionalBedeutsamerWanderweg_ Wasserwandern	7_3_1_4_OtherNetworkInfrastructure
xplanNSM:RP_NSM_Tourismus	
TourismusErholung	7_1_3_4_Tourism
SchwerpunktbereichErholung	7_1_3_4_Tourism
EntwicklungsgebietTourismusErholung	7_1_3_4_Tourism
KernbereichTourismusErholung	7_1_3_4_Tourism
KernbereichTourismus	7_1_3_4_Tourism
TourismusKuestenraum	7_1_3_4_Tourism
RP_Bodenschutz	7_2_8_Recultivation
BeseitigungErheblicherBodenbelastungen	7_2_8_Recultivation
SicherungSanierungVonAltlasten	7_2_8_Recultivation
RP_VorbHochwasserschutz	2_1_FloodRisks
Sperrwerk	2_1_FloodRisks
Hochwasserrueckhaltebecken_Bauwerk	2_1_FloodRisks
Hochwasserrueckhaltebecken	2_1_FloodRisks
Kuestenhochwasserschutz	7_2_9_1_CoastalZoneManagementArea

Deich	2_1_FloodRisks
Hochwasserschutz	2_1_FloodRisks
HochwGefaerhrdeteKuestenniederung	7_2_9_1_CoastalZoneManagementArea
RP_Klimaschutz	1_5_ClimateProtection
RP_GruenzugGruenzaesur	7_2_6_GreenBreak
RP_SonstFreiraumstruktur	7_2_OpenSpaceStructure
RP_NaturschutzrechtlichesSchutzgebiet	
Naturschutzgebiet	1_4_NatureProtection
Nationalpark	1_4_NatureProtection
Biosphaerenreservat	1_4_2_BiodiversityReservoir
Landschaftsschutzgebiet	3_2_LandscapeAreaProtection
Naturpark	3_1_2_GeodiversityProtection
Naturdenkmal	3_1_NaturalHeritageProtection
GeschuetzterLandschaftsBestandteil	3_2_LandscapeAreaProtection
GesetzlichGeschuetztesBiotop	3_1_1_BiodiversityProtection
Natura2000	1_4_NatureProtection
GebietGemeinschaftlicherBedeutung	1_4_NatureProtection
EuropaeischesVogelschutzgebiet	1_4_NatureProtection
NationalesNaturmonument	3_2_LandscapeAreaProtection
Sonstiges	3_1_NaturalHeritageProtection
xplanNSM:besondereZweckbestimmungNSG	
Kernzone	9_RegulatedActivities
RP_Gewaesser	7_2_9_Water
RP_KulturellesSachgut	3_HeritageProtection
RP_Verkehr	
Schienenverkehr	7_3_1_2_RailRoad
Strassenverkehr	7_3_1_1_Road
Luftverkehr	7_3_1_Network
Wasserverkehr	7_3_1_3_WaterInfrastructure
SonstigerVerkehr	7_3_1_Network
xplanNSM:RP_NSM_Strassenverkehr	
Autobahn_sechsstreifig	7_3_1_1_Road
Autobahn_vierstreifig	7_3_1_1_Road
GrossraeumigesStrassennetz	7_3_1_1_Road
Hauptverkehrsstrasse_vierstreifig	7_3_1_1_Road
Hauptverkehrsstrasse	7_3_1_1_Road
UeberregionalesStrassennetz	7_3_1_1_Road
Hauptverkehrsstrasse_Problembereich	7_3_1_1_Road
StrasseVonRegionalerBedeutung	7_3_1_1_Road
RegionalesStrassennetz	7_3_1_1_Road
StrasseVonRegionalerBedeutung_Problembereich	7_3_1_1_Road
BedeutsamesFlaechenerschliessendes	7_3_1_1_Road

INSPIRE	Reference: D2.8.III.4_v2.9		
TWG-LU	Data Specification on <i>Land Use</i>	2012-02-23	Page 197

Strassennetz	
Faehrverbindung	7_3_1_1_Road
Anschlussstelle	7_3_1_1_Road
Strassentunnel	7_3_1_1_Road
xplanNSM:RP_NSM_Schienenverkehr	
Haupteisenbahnstrecke	7_3_1_2_RailRoad
Haupteisenbahnstrecke_Zwei_Mehrgleisig	7_3_1_2_RailRoad
Haupteisenbahnstrecke_Eingleisig	7_3_1_2_RailRoad
GrossraeumigesSchienennetz	7_3_1_2_RailRoad
UeberregionalesSchienennetz	7_3_1_2_RailRoad
SonstigeEisenbahnstrecke	7_3_1_2_RailRoad
RegionalesSchienennetz	7_3_1_2_RailRoad
OhneBetrieb_Trassensicherung	7_3_1_2_RailRoad
Stadtbahn	7_3_1_2_RailRoad
xplanNSM:RP_NSM_Wasserverkehr	
Seehafen_Binnenhafen	7_1_3_9_HarborActivities
HafenVonUeberregionalerBedeutung	7_1_3_9_HarborActivities
HafenVorRegionalerBedeutung	7_1_3_9_HarborActivities
Hafen	7_1_3_9_HarborActivities
Sportboothafen	7_1_3_9_HarborActivities
Umschlagplatz	7_1_3_9_HarborActivities
Schleuse_Hebewerk	7_3_1_3_WaterInfrastructure
Schiffahrt	7_3_1_5_RegulatedFairwayAtSeaOrLargeInlandWater
Wichtiger_Schiffahrtsweg	7_3_1_5_RegulatedFairwayAtSeaOrLargeInlandWater
Sonstiger_Schiffahrtsweg	7_3_1_5_RegulatedFairwayAtSeaOrLargeInlandWater
UeberregionaleFaehrverbindung	7_3_1_5_RegulatedFairwayAtSeaOrLargeInlandWater
Reede	7_3_1_5_RegulatedFairwayAtSeaOrLargeInlandWater
xplanNSM:RP_NSM_Luftverkehr	
Flughafen	7_1_3_1_0AirportActivities
Verkehrsflughafen	7_1_3_1_0AirportActivities
Regionalflughafen	7_1_3_1_0AirportActivities
Verkehrslandeplatz	7_1_3_1_0AirportActivities
Regionalflugplatz	7_1_3_1_0AirportActivities
SonstigerFlugplatz	7_1_3_1_0AirportActivities
Bauschutzbereich	6_6_BuildingHightRegulation
RP_Entsorgung	
Abfallwirtschaft	7_3_3_Disposal
Abwasserwirtschaft	7_3_3_Disposal
SonstigeEntsorgung	7_3_3_Disposal
xplanNSM:RP_NSM_Abwasser	
ZentraleKlaieranlage	7_3_3_Disposal

Grossklaerwerk	7_3_3_Disposal
Hauptabwasserleitung	7_3_3_Disposal
Abwasserverwertungsflaeche	7_3_3_Disposal
xplanNSM:RP_NSM_Abfallentsorgung	
SicherungVonStandortenFuer Siedlungsabfalldeponien	7_3_3_Disposal
ZentraleAbfallbeseitigungsAnlage	7_3_3_Disposal
ZentraleAbfallverwertung_Deponie	7_3_3_Disposal
ZentraleAbfallverwertung_ Siedlungsabfalldeponie	7_3_3_Disposal
ZentraleAbfallverwertung_ Mineralstoffdeponie	7_3_3_Disposal
ZentraleAbfallverwertung_ Kompostierung	7_3_3_Disposal
ZentraleAbfallverwertung_ Verbrennung	7_3_3_Disposal
ZentraleAbfallverwertung_ Behandlung	7_3_3_Disposal
ZentraleAbfallverwertung_ Untertageeinlagerung	7_3_3_Disposal
Sonderabfallbeseitigung Sonderabfallbehandlung	7_3_3_Disposal
EntsorgungRadioaktiverAbfalle	7_3_3_Disposal
RP_Energieversorgung	
Hochspannungsleitung	7_3_2_Supply
Pipeline	7_3_2_Supply
Kraftwerk	7_3_2_Supply
EnergieSpeicherung	7_3_2_Supply
Umspannwerk	7_3_2_Supply
SonstigeEnergieversorgung	7_3_2_Supply
Leitungstrasse	7_3_2_Supply
Leitungstrasse_110KV	7_3_2_Supply
Leitungstrasse_220KV	7_3_2_Supply
Leitungstrasse_380KV	7_3_2_Supply
Kabeltrasse_Netzanbindung	7_3_2_Supply
Rohrfernleitung_Erdoel	7_3_2_Supply
Rohrfernleitung_Gas	7_3_2_Supply
Rohrfernleitung_Fernwaerme	7_3_2_Supply
Rohrfernleitung_Kraftstoff	7_3_2_Supply
UebergabestationFerngas	7_3_2_Supply
Kraftwerk_Kohle	7_3_2_Supply
Kraftwerk_Gas	7_3_2_Supply
Kraftwerk_Erdoel	7_3_2_Supply
Kraftwerk_Wasser	7_3_2_Supply
Kraftwerk_Kernenergie	7_3_2_Supply

Kraftwerk_Reststoffverwertung	7_3_2_Supply
Grosskraftwerk	7_3_2_Supply
Grosskraftwerk_Kohle	7_3_2_Supply
Grosskraftwerk_Gas	7_3_2_Supply
Grosskraftwerk_Erdoel	7_3_2_Supply
Grosskraftwerk_Wasser	7_3_2_Supply
Grosskraftwerk_Kernenergie	7_3_2_Supply
Grosskraftwerk_Reststoffverwertung	7_3_2_Supply
Energiegewinnung	7_3_2_Supply
Energiegewinnung_Kohle	7_3_2_Supply
Energiegewinnung_Gas	7_3_2_Supply
Energiegewinnung_Erdoel	7_3_2_Supply
Energiegewinnung_Wasser	7_3_2_Supply
Energiegewinnung_Kernenergie	7_3_2_Supply
SpeicherungPrimaerenergie_Erdoel	7_3_2_Supply
SpeicherungPrimaerenergie_Gas	7_3_2_Supply
VerstetigungSpeicherungRegenerativeEnergie	1_3_RewenableEnergyArea
Untergundspeicher	1_3_RewenableEnergyArea
Windenergienutzung	1_3_RewenableEnergyArea
ErneuerbareEnergien	1_3_RewenableEnergyArea
RP_Laermschutzbereich	
Laermbereich	1_1_NoiseManagementZone
Laermschutzbereich	1_1_1_NoiseProtectionArea
Siedlungsbeschaenkungsbereich	1_1_NoiseManagementZone
Siedlungszaesur	1_1_NoiseManagementZone
RP_Wasserwirtschaft	
Wasserleitung	7_3_2_Supply
Wasserwerk	7_3_2_Supply
TalsperreStaudammDeich	7_3_2_Supply
TalsperreSpeicherbecken	7_3_2_Supply
Rückhaltebecken	7_3_2_Supply
SonstigeWasserwirtschaft	7_3_2_Supply
RP_SozialeInfrastruktur	
Kultur	7_3_5_OtherInfrastructure
Sozialeinrichtung	7_3_5_OtherInfrastructure
Gesundheit	7_3_5_OtherInfrastructure
Bildung	7_3_5_OtherInfrastructure
SonstigeSozialeInfrastruktur	7_3_5_OtherInfrastructure
RP_SonstigeInfrastruktur	7_3_Infrastructure_
RP_Raumkategorie	7_1_4_SpatialOrderCategories_
Ordnungsraum	7_1_4_7_PeriUrbanAreas
OrdnungsraumTourismusErholung	7_1_4_7_PeriUrbanAreas

INSPIRE	Reference: D2.8.III.4_v2.9		
TWG-LU	Data Specification on <i>Land Use</i>	2012-02-23	Page 200

Verdichtungsraum	7_1_4_3_CityAndOuterConurbationArea
LaendlicheRaum	7_1_4_1_RuralArea
StadtUmlandRaum	7_1_4_6_FunctionalUrbanArea
StadtUmlandBereichLaendlRaum	7_1_4_6_FunctionalUrbanArea
AbgrenzungOrdnungsraum	7_1_6_OtherSettlementStructureDevelopmentPolicies
Oberbereichsgrenze	7_1_6_OtherSettlementStructureDevelopmentPolicies
Mittelbereichsgrenze	7_1_6_OtherSettlementStructureDevelopmentPolicies
Nahbereichsgrenze	7_1_6_OtherSettlementStructureDevelopmentPolicies
DuennbesiedeltesAbgelegenesGebiet	7_1_6_OtherSettlementStructureDevelopmentPolicies
Umkreis_10_Km	7_1_6_OtherSettlementStructureDevelopmentPolicies
RP_Sperrgebiet	9_1_RestrictedActivities
SondergebietBund	9_1_RestrictedActivities
GrosseMilitaerischeAnlage	9_1_RestrictedActivities
Warngbiet	9_1_RestrictedActivities
RP_ZentralerOrt	
Oberzentrum	7_1_1_4_HighOrderCentre
Mittelzentrum	7_1_1_3_MiddleOrderCentre
Grundzentrum	7_1_1_2_LowerOrderCentre
Kleinzentrum	7_1_1_1_Basic
SonstigeFunktion	7_1_1_CentralPlaces
GemeinsamesOberzentrum	7_1_1_4_HighOrderCentre
MittelzentrumMitOberzentralerTeilfunktion	7_1_1_3_MiddleOrderCentre
MittelzentrumImVerdichtungsraum	7_1_1_3_MiddleOrderCentre
GrundzentrumMitMittelzentralerTeilfunktion	7_1_1_2_LowerOrderCentre
Untzentrum	7_1_1_1_Basic
UntzentrumMitMittelzentralerTeilfunktion	7_1_1_1_Basic
Stadtrandkern_1_Ordnung	7_1_6_OtherSettlementStructureDevelopmentPolicies
Stadtrandkern_1_Ordnung MitMittelzentralerTeilfunktion	7_1_6_OtherSettlementStructureDevelopmentPolicies
Stadtrandkern_2_Ordnung	7_1_6_OtherSettlementStructureDevelopmentPolicies
LaendlicherZentralort	7_1_6_OtherSettlementStructureDevelopmentPolicies
ZentralesSiedlungsgebiet	7_1_6_OtherSettlementStructureDevelopmentPolicies
RP_GemeindeFunktion Siedlungsentwicklung	
Wohnen	7_1_3_1_Housing
Arbeiten	7_1_3_2_CommerceIndustry
Landwirtschaft	7_1_3_5_Agriculture
Einzelhandel	7_1_3_3_Services
ErholungFreundenverkehr	7_1_3_4_Tourism
Verteidigung	7_1_3_AssignmentOfFunctions_
SonstigeNutzung	7_1_3_AssignmentOfFunctions_
xplanNSM:RP_NSM_ASM	

INSPIRE	Reference: D2.8.III.4_v2.9		
TWG-LU	Data Specification on <i>Land Use</i>	2012-02-23	Page 201

Wohnfunktion	7_1_3_1_Housing
GewerbeDienstleistungsfunktion	7_1_3_2_CommerceIndustry
WohnGewerbeDienstLeistungsfunktion	7_1_3_1_Housing
UeberoertlVersorgungsfunktionLaendlRaum	7_1_3_3_Services
Baugebietsgrenze	7_LocalRegionalStateDevelopmentPolicies
Siedlungsgebiet	7_LocalRegionalStateDevelopmentPolicies
Siedlungsschwerpunkt	7_1_SettlementStructure
RP_Achse	
Siedlungsachse	7_1_2_1_SettlementAxes
GrossraeumigeAchse	7_1_2_2_SupralocalAxes
SonstigeAchse	7_1_2_Axes
Siedlungsachse	7_1_2_1_SettlementAxes
Landesentwicklungsachse	7_1_2_2_SupralocalAxes

INSPIRE	Reference: D2.8.III.4_v2.9		
TWG-LU	Data Specification on <i>Land Use</i>	2012-02-23	Page 202

Annex E (informative) Land use and Land Cover Relations

Land Cover and Land Use have been considered for decades as remarkable aspects for describing and understanding land's physiognomy and utilization. Land Cover and Land Use information is important background information for environmental issues related to the land surface such as habitats, biodiversity, catchments hydrology, and climate change³⁴

The three main and essential features in the context of describing the interrelation between Land Cover and Land Use are: (1) the concepts of Land Cover and Land Use, (2) the questions of land units, and (3) the available sources of data for feeding such a component. The third feature will not be commented in the following paragraphs.

E.1 Land cover and land use definitions

Definition for Land Cover and Land Use concepts is widely known in many of land nomenclatures and projects, and INSPIRE 2007/2/CE Directive mainly defines them as bio-physical and functional range on land, respectively.

- Land Cover: Physical and biological cover of the earth's surface including artificial surfaces, agricultural areas, forests, (semi-)natural areas, wetlands, water bodies.
- Land Use: Territory characterised according to its current and future planned functional dimension or socio-economic purpose.

There are also more definitions available from UN FAO, UE CORINE and LUCAS projects or national databases that complement and clarify in detail their definitions. In particular it is remarkable that both definitions are feasible for different scopes: 1) on, above or below of surface, and 2) terrestrial, marine and aerial areas.

The relation between Land Cover and Land Use is strong and indissoluble, because the existence of use implies causes and consequences on cover and vice versa. Land Cover and Land Use are essential components of the land as for each location one type of Land Cover and one type of Land Use can be identified. However, definitions of Land cover and Land Use in many existing information systems and nomenclatures are often mixed, they are even sometimes seen as the same phenomenon. Notwithstanding to reach a complete solution of both components, initially Land Cover and Land Use should be treated in parallel way for finally inferring the joint vision. They describe quite distinct dimensions of the land surface and should be separately defined and classified to prevent ambiguous interpretations.

Furthermore it is important to remind that, contrarily to Land Cover, many Land Uses cannot be directly extracted using land monitoring techniques such as aerial photography, and require direct field observation or the use of ancillary (planning) data.

There are various approaches that describe the concept of Land Use in different ways. In the literature the following aspects are often quoted

- "Functional" corresponds to the description of land in terms of its socio-economic purpose (agricultural, residential, forestry etc.) and links with Land Cover are possible. It could be simply identified as "activities"

³⁴ Main references:

- National Land Use Data Base (NLUD). 2006. Office of the Deputy Primer Minister. United Kingdom.
- First approximation of a reference land use classification. Christophe Duhamel. 1998. UN-FAO
- Outcome Paper for Global Consultation. Issue#19a: Land use classification. System of integrated Environmental and Economic Accounting (SEEA). UN-Statistical Division
- Land Use classification proposed to be used in the SEEA. Gong, Marklund, Tsuji. 2009. UN-FAO

- “Sequential” corresponds to a series of operations on land, carried out by humans, with the intention to obtain products and/or benefits through using land resources. It could be simply identified as “results from activities”.

In the Land use data specification three main aspects have been modelled as feature types:

- “Existing” or material Land Use in the time of observation. Traditionally, activities effectively carried out are taken into consideration. These activities are collected from land observation and monitoring projects.
- “Planned” Land Use regulated by spatial planning documents elaborated at various levels of administration.
- “Supplementary regulations” are information and/or limitations on Land Use activities according to regulations. It restricts or conditions the exercise of the freedom to use one’s land property

The choice has been made to incorporate the “Functional” and “Sequential” aspects into the Land Use nomenclatures.

Existing	Activity	Functional (activity's essence)
		Sequential (activity's result)
Planned	Activity	Functional (activity's essence)
		Sequential (activity's result)
	Supplementary regulations	Functional (activity's essence)

LU Branches in INSPIRE data specifications

E.2 Dependencies and consequences between land cover and land use

Due to the close relation between Land Cover and Land Use the presence of a particular Land Cover often conditions the Land Use type and can prevent other land uses. Also the other way round is possible, the present Land Cover can be deduced or the future Land Cover can be predicted from a specific Land Use type. In this way, rules of inference could be established for different applications to identify trends or changes.

For example, a parcel of land covered by field crops can reasonably be associated with agricultural use, or a river area will only be used for transport and fishing. A residential area will be made up of a mosaic of land cover types including dwellings, other buildings, gardens, roads, paths, woodland and bare surfaces. Similarly, an area used for managed forestry would be expected to be covered by trees. If it were not, then it may be inferred that the woodland had been felled or the land was being prepared for forestation. Or a parcel designated in a plan to be urban park will contain vegetation coverage in the future instead artificial structures.

Another important aspect regarding Land Cover and Land Use is the thematic level of detail of each nomenclature. For reaching favourable results relating Land Cover and Land Use data, there have to be comparable classes with a similar level of thematic detail in each nomenclature.

E.3 Land unit

‘Land’ is a widely-used and often loosely-defined term, but classifications are closely tied to the uses which will be made of land data collected. Land Unit can be defined as *“A delineable area of the earth's terrestrial surface, embracing all attributes of the biosphere immediately above or below this surface, including those of the near surface climate, the soil and terrain forms, the surface hydrology including shallow lakes, rivers, marshes and swamps, the near-surface sedimentary layers and associated groundwater and geohydrological reserves, the plant and animal populations, the human*

INSPIRE	Reference: D2.8.III.4_v2.9		
TWG-LU	Data Specification on <i>Land Use</i>	2012-02-23	Page 204

*settlement pattern and physical results of past and present human activity (terracing, water storage or drainage structures, roads, buildings, etc.)*³⁵

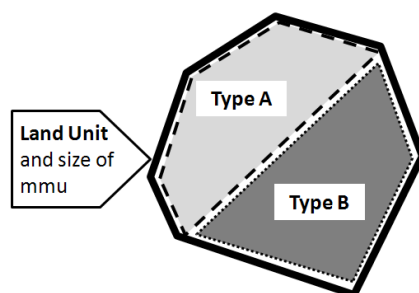
However the delineation of Land Cover and Land Use types is often difficult as there are no easily identifiable natural 'units' or 'objects' that form the basis for identification of Land Cover and Land Use types. Where an object has a physical boundary (e.g. factory, dwelling, plot of grazing land) due to its man-made origin, it is easily identifiable. However, identifying objects and delineating boundaries in semi-natural environments or complex buildings is more intractable. Even more complicated is the delineation of objects with multiple uses to be identified vertically, i.e. use above and below ground level at the same location.

A spatial information system regarding Land Cover or Land Use needs spatial units that are represented by geometry like a polygon or a grid cell. For defining a Land Unit, two fundamental principles are important:

- Land Units should represent homogeneous and continuous Land Cover or Land Use.
- Land Units should be conformed to cartographic restrictions as Minimum Mapping Unit, and/or shape of land unit (e.g. minimum width).

When the complexity of the real world is simple both principles can be maintained to delineate the Land Cover or Land Use. However, when the reality is more complex the correct identification can't meet both principles. Normally, for simplifying the management of information, the second principle takes preference over the first, resulting in mixtures of land use types in horizontal, vertical or temporal dimension.

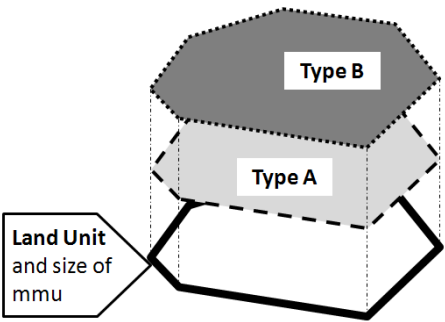
Horizontal mixing by 'juxtaposition' is strongly dependant on the scale and unit of observation e.g. the mixing of sports facilities with other recreational areas within an outdoor amenity space or the assemblage of uses within a defined industrial site. These configurations are usually handled through definition and application of rules. Rules of 'preferences' usually are employed for Land Use,. An example is the 'main activity' rule which determines the activity on which other activities or uses depend and without which they would loose their purpose. This is illustrated by a manufacturing plant that accommodates several uses additional to, but dependent on, manufacturing, such as storage, car and lorry parking and offices.



Horizontal mixing 'juxtaposition'

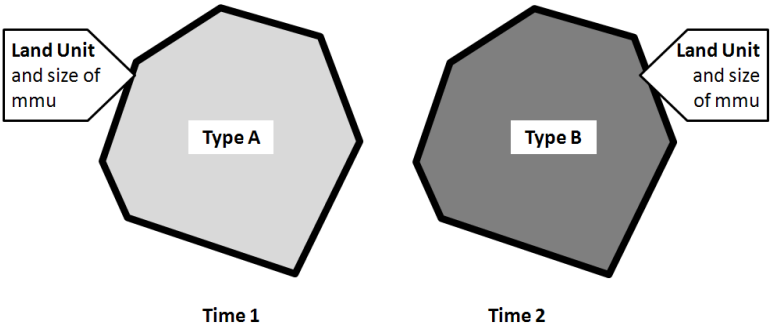
Vertical mixing in the third dimension is caused by 'superposition' of different covers or uses. Mixing in the third dimension is independent of scale of observation and requires a rule so that elements are correctly identified and recorded. Blocks of offices and/or flats with shops at ground level provide a classic case of mixing by superposition. 'Mapping' rules such as 'majority use' or 'ground floor use' are sometimes used in land use surveys to cartographically depict Land use. However, in both cases there is a loss of information which could be significant for user related purposes. Recording all uses at all levels provides a more generic approach that can serve multiple applications and still allows, if necessary, the subsequent application of a mapping rule to simplify the occurrence of multiple uses for display purposes.

³⁵ IDWG-LUP at UN-FAO, 1994



Vertical mixing 'superposition'

Temporal mixing is used to describe instances where the land accommodates more than one cover or use and is highly dependent on the time of observation. Temporal mixing can be virtually simultaneous, for example, forestry and recreation, water storage and recreation, or can occur over longer cycles, for example, weekday car park and weekend market. Again the application of a 'mapping' rule such as 'primary use' that seeks to identify a single or primary use for each piece of land will result in a loss of information. Recording all instances of use is usually preferred.



Temporal mixing

With the previous definition of the Land Unit it is clear that different geometries for LU and LC exist. The relation between these geometries depends on the complexity of the land information system. The simplest relationship between the LC and LU is the superposition of both geometries that will not fit 1:1 in most cases.

INSPIRE	Reference: D2.8.III.4_v2.9		
TWG-LU	Data Specification on <i>Land Use</i>	2012-02-23	Page 206

Annex F (informative) Proposed changes to D2.3 V3.0

There are two main land use definitions, a **functional** one and **sequential** one (Duhamel, 1998). The functional definition defines land use as *the description of land in terms of its socio-economic purpose (agricultural, residential, forestry etc.)*. The sequential definition describes land use as *a series of operations on land, carried out by humans, with the intention to obtain products and/or benefits through using land resources. However, examples given for the sequential definition of land use are limited to operation sequences decided by farmers over years: ploughing, seeding, weeding, fertilizing, weeding, harvesting for maize the first year, etc. This concept would need more clarification in non agricultural domain. This sequential approach is rather complex since the majority of attributes are not inherent features of land use, the proposed system is tailored uniquely towards agricultural uses and introduces a difficult component of time (reference period of observation and cycles). Providing such detailed information would raise many questions: who needs this information, how to design a cost-efficient system at such a detailed level? In addition, links with land cover classification could not be ensured.*

Therefore the functional definition of Land Use will be used for defining the relevant INSPIRE theme. One of the key component of INSPIRE Land use theme will be the nomenclature that defines the socio-economic purpose taken into consideration and the level of detail to be retained as well as the question of extensive use versus intensive use of land, e.g. regarding agriculture practices, level of social mix, or density of houses.

F.1 Land use plans/land use regulation

The land use plans regulate actual and future use of areas. The land use plans commonly have significant textual regulations to each area/land category or specific areas. The land use plans are of varying detail; Municipal land use plans, detailed regulation plans for blocks or smaller areas within urban areas.

- Land use may be seen as divisions at a nationwide level, e.g. distinguishing between private and state owned land.
- Land use plan is commonly made at regional levels as kinds of master plans, e.g. covering the full extent of several municipalities, the borders of areas defined in the map being fuzzy
- Land regulation plans at detailed low level may cover populated areas or areas of specific economic or social interest. The plans may direct utilization level, the % of building coverage within areas, height regulations or functional regulations, and maps produced apply to the cadastral, parcels.

It is a very diverse situation concerning land regulation/land use plans as these spatial data commonly are based on national or regional legislation or other kinds of regulation. The documents/maps are frequently seen as legal documents, and the categories remain for decades as rights directing use land and property. These documents are opposable to third parties in their paper form and their digital versions have no legal status in many European countries. Does INSPIRE have to deal with the textual regulation, necessarily written in the national languages? Focussing on the broader categories, but the option is left open for countries to add a hyperlink to the full land use regulation text. Categories of land use follow such regulations. Furthermore, operational plans may for some areas be old and based on older legislation, and their nomenclature may be obsolete. Operational land use plans may be as old as 100 years or more. Also plans being proposed and being in a process or public/sectoral hearing can be relevant for dissemination in the infrastructure. The time dimension is also related to the process of devising a spatial planning document as well as the relation between past land use zoning and the actual changes in the land use observed long time after plan is approved.

INSPIRE	Reference: D2.8.III.4_v2.9		
TWG-LU	Data Specification on <i>Land Use</i>	2012-02-23	Page 207

It is possible to allocate three different land uses to one parcel: the pre-destination, the destination and the after-destination. For example an agricultural area is allowed to keep on existing until 2012, after which it will be turned into a mining area, after the mining has finished the land will be converted into a nature reserve.

F.2 Functional land use – according to socio-economic purpose

Functional areas within urban or rural areas may be mapped through fieldwork, register information or through modelling using socio-economic input data in a GIS. A classification of the land use phenomenon may be based on the ISIC Rev.3 (International Standard Classification of All Economic Activities) classification drawn up by the United Nations (approved by the Statistical Commission in 1989) and recommended for use throughout the world. This classification is integrated in the sense that it ensures a full harmonization with another main branch of economic classifications: the classifications of products (ICPC Central Product Classification) which are fundamental for foreign trade statistics, statistics of production and consumption, energy statistics, etc. The ISIC classification may therefore be appropriate to characterise land use percentages for administrative units. The ISIC Rev. 3, is fully compatible with the EU NACE Rev. 1 (Nomenclature des Activités de la Communauté Européenne) system for the first two levels. (System replaced by 1.1.2008, see references). On the other hand the ISIC system is not in use within the spatial planners community mainly because it does not provide entries for “residential area”, “recreation areas”, “mix residential-activity area” that are common in spatial planning documents.

Whichever system will be recommended in the INSPIRE Context, member states will have to develop their own mapping from national classification to it. The question remains with the planners’ usage regarding land use classes. Being contacted, the International Society of City and Regional Planners (ISOCARP) has not developed any such classification scheme.

F.3 Scope, use examples

Many of the management and planning activities at local level require detailed data. Proper location, the geographical position, is important. The level of accuracy needed in location varies, the need for (and will to produce) accurate data being higher in urban or built-up areas and lower in rural and natural/semi-natural environments. Data producers may be requested to provide information on the positional accuracy and the exhaustivity of their LU datasets. The concept of “minimum LU unit” questions the mandatory provision of the size of the MLU unit by the producer. Similarly, interest in frequent updating decreases with distance from central areas. The detailed area planning covers both land and sea/coastal areas including inland and some off shore water bodies.

Land Use is important for impact assessment and monitoring of implementation of policies and legal instruments for sustainable management of the environment, like Natura2000.

Policies:

6EAP, EIA guidelines. Several policies and strategies give highlight the value of regional approaches with integrated land/area management, such as the Integrated Coastal Zone Management, Communication on planning and environment, Water Framework Directive and the Communication on risk prevention.

Environmental Impact Assessments (EIAs) for projects and Strategic Environmental Assessment (SEAs) for policies, plans and programmes ensure that significant environmental impacts are identified, assessed and taken into account in decision-making process to which the public can participate.

Others European policies and issues including the climate change policy, sea level rise, Urban sprawl, soil directive, polluted soil, regional policies and related relevant national policies will require Land use information.

INSPIRE	Reference: D2.8.III.4_v2.9		
TWG-LU	Data Specification on <i>Land Use</i>	2012-02-23	Page 208

F.4 Important feature types and attributes

Kinds of features depend on kind of land use and land use plan. A representation of a land use plan may be structured as a layered dataset.

- boundary of plan/regulation
- land use category area
- land use regulation area or prescription regarding land use
- land use restriction area or constraints regarding land use (in connection with the Area management/restriction/regulation zones and reporting units theme)
- elements within a plan (road boundaries, building boundaries, forest/agricultural land boundaries etc.)

Does the “back-ground” or reference material over which the zoning map is created be part of the Land Use theme? Is it an information to be documented in the Metadata associated with LU datasets? This raise the issue of relative positional accuracy of two layers to be superimposed.

Important attributes

- land use category
- land use regulation category
- land use restriction category
- present/existing or proposed/planned/future
- legal reference
- date of entry into force
- link to text regulations for each area

F.5 Links and overlaps with other themes

- Cadastral parcels as a possible back-ground for a given Land Use datasets: relative positioning
- Administrative units that are concerned with a given Land use dataset: Geometric overlap
- Statistical units that are concerned with a given Land use dataset: Geometric overlap
- Geographical names associated with land use area: Geometric overlap
- Hydrography as elements within a plan: Geometric overlap
- Transport networks as elements within a plan: Geometric overlap
- Protected sites as elements within a plan: Geometric overlap
- Land cover as a possible back-ground for a given Land Use datasets: relative positioning
- Buildings as elements within a plan: Geometric overlap
- Human health and safety as elements within a plan: Sharing nomenclature and geometric overlap
- Utility and governmental services as elements within a plan: Sharing nomenclature and geometric overlap
- Production and industrial facilities as elements within a plan: Sharing nomenclature and geometric overlap
- Agricultural and aquacultural facilities as elements within a plan: Sharing nomenclature and geometric overlap

INSPIRE	Reference: D2.8.III.4_v2.9		
TWG-LU	Data Specification on <i>Land Use</i>	2012-02-23	Page 209

- Population distribution – demography as input to the spatial planning process:
- Area management/restriction/regulation zones and reporting units as elements within a plan: Sharing nomenclature and geometric overlap
- Natural risk zones as elements within a plan: Sharing nomenclature and geometric overlap
- Habitats and biotopes as elements within a plan: Sharing nomenclature and geometric overlap
- Energy resources as elements within a plan: Sharing nomenclature and geometric overlap
- Mineral resources as elements within a plan: Sharing nomenclature and geometric overlap

F.6 Reference documents

Christophe Duhamel (1998) First approximation of a reference land use classification, Report to the FAO

CNIG: Annexe 5 – Liste des données géographiques de référence en domaine littoral (France)
CORINE as a European Land Use nomenclature (e.g. urban sprawl MOLAND).

Council Regulation (EEC) no. 3037/90 concerning the statistical classification of economic activities in the European Community (NACE rev.1) is repealed by Regulation (EC) no. 1893/2006 of the European Parliament and of the Council of 20 December 2006 establishing the statistical classification of economic activities NACE revision 2 and amending Council Regulation (EEC) No 3037/90 as well as certain EC Regulations on specific statistical domains. (NACE rev. 2) This Regulation shall apply from 1 January 2008. As a consequence NACE rev.1 as well as ISIC Rev. 3 is not applicable from 1 January 2008 onwards.

EuroGeographics: EuroRegionalMap Specification 4.0 and Data Catalogue

INTESA-GIS: 1n1007_1-2 - Specifiche per la realizzazione dei data base topografici di interesse generale. Il catalogo degli oggetti (v.3_3). (Italy)

Nomenclature statistique des Activités économiques dans la Communauté Européenne (NACE), revision 1.1, at : http://www.fifoost.org/database/nace/index_en.php

Norwegian feature catalogue including different chapters and UML models for land use planning/masterplan, land cover (with a land use component) See URLs:
<http://www.statkart.no/sosi/UMLfullmodell/Plan/Plan.htm>
<http://www.statkart.no/sosi/UMLfullmodell/Markslag/Markslag.htm>

RAVI:NEN3610 by “Ministry of Housing, Spatial Planning and Environment (VROM), Information model Land use plans (Informatiemodel Ruimtelijke Ordening), 2006, http://www.helpdeskdurp.nl/files/412/deelpublicatie_6_.pdf”

United Nations, International Standard Industrial Classification (ISIC), Rev. 3, at: <http://unstats.un.org/unsd/cr/registry/regcst.asp?Cl=2>

INSPIRE	Reference: D2.8.III.4_v2.9		
TWG-LU	Data Specification on <i>Land Use</i>	2012-02-23	Page 210

Annex G (informative) Ecological function of land

According to the INSPIRE definition land use is described as a functional dimension or socio-economic purpose. This view on land use raises the question if nature / protecting biodiversity / the ecological function of land can be seen as a human activity and thus can be classified as land use. It is arguable that nature does not serve an economic function for humans. In this light, nature areas should be classified as areas with no use. There is however another view that should be taken into account, which defines land use as the description of land in terms of its socio-economic and ecological purpose.

Nature 2000 is a European agreement to create a European Ecological Network. In this agreement existing nature is protected and new nature is realized. To form this network ecological corridors and stepping stones are created in order to let species more easily spread from one area to another. The existing nature in Europe is however not something that just exists without interference of humans, this nature must be actively protected. Local, regional and national governments and associations try to enhance the biodiversity in those areas. New nature is created, for example by digging away fertile, overly fertilized top soils and revealing the poor soil underneath or by making sure the groundwater levels don't fall beneath a certain level. By doing this environments are created to attract endangered species, to give them a place where a stable community can survive.

Nature management plans are made to provide the right circumstances for target species to keep on living in a specific area. Other areas can be modified to create conditions to attract new (endangered) species. Take the example of a grassland or meadow, to make sure that rare grass-species keep on existing it is essential that the grass is often and at the right time cut. Otherwise trees will start growing that will push away the grasses and flowers. Heath or moorland is also often a created 'natural area'. If the human activity that created it stops, heath will soon become forest.

And even if nothing had to be done to make sure nature thrives in nature areas, humans still need to actively protect these areas. Without the protection or legal regulation, other (economically more interesting) functions would soon take over. Biodiversity would be at risk.

Besides the dominant land use 'nature area' these sites are often also 'used' for other human activities. They can be used as recreation area or as places to educate people. Besides direct use green environments also have a positive influence on our health, physically and mentally. Finally, all these nature areas also have an (indirect) economic value: larger numbers of plant species means a greater variety of crops (possibly useful for people in the future)

Nature areas also influence the space next to it. Green environments have a proven positive effect on humans therefore increasing the 'livability' in areas adjacent to it. Besides the positive effect on residential areas it is also interesting for the economy, having nature or green areas in the neighborhood increases the value of the property next to it. Of course it can also devalue the property next to it when strict regulations are in place to make sure other land uses do not have a negative effect on nature. As a final remark it can be stated that greater species diversity ensures natural sustainability for all life forms and healthy ecosystems can better withstand and recover from a variety of disasters.

If you take the definition of the FAO: Land use is "the total of arrangements, activities, and inputs that people undertake in a certain land cover type", Nature or preserving nature, as argued above is definitely a form of land use.

INSPIRE	Reference: D2.8.III.4_v2.9		
TWG-LU	Data Specification on <i>Land Use</i>	2012-02-23	Page 211

Annex H (informative) Use of PLU model for strategic planning in Germany

In Germany the essential purposes of spatial planning on regional and state level are elaborated and implemented by a range of tools on three levels:

- federal spatial planning,
- state spatial planning,
- regional spatial planning.

On federal spatial planning level there is no binding development plan provided for controlling and developing the national territory as a whole. The Federal Ministry of Transport, Building and Urban Affairs establish a development plan for the exclusive economic zone beyond coastal waters (200 mile zone).

State spatial planning addresses spatial development in the state as a whole, while regional planning is concerned with subdivisions of a state. State spatial planning authorities have to ensure that the goals and principles of national spatial planning and state spatial planning are respected and taken into account in local government planning. In a system of mixed top-down/bottom-up planning (principle of countervailing influence), they accept suggestions from local authorities and are required to coordinate local development goals with superordinate planning goals. The aim is to ensure that urban land-use planning does not cross the development aims of state spatial planning but supports them, thus avoiding investment mistakes. The function of these plans (name differ from state to state like state development plan or state development programme) is to coordinate the spatially relevant planning and projects of all competent organisational units and to tie them in with the conceptual aims of state spatial planning itself. In the city-states of Berlin, Bremen, and Hamburg a preparatory land-use plan pursuant to Section 5 of the Building Code can perform the same function.

Below state level of spatial planning, regional planning is concerned with the detailed elaboration, sectoral integration, and implementation of the goals of state spatial planning. It accordingly mediates between state spatial planning and local urban land-use planning. Regional planning must conform with federal and state spatial planning.

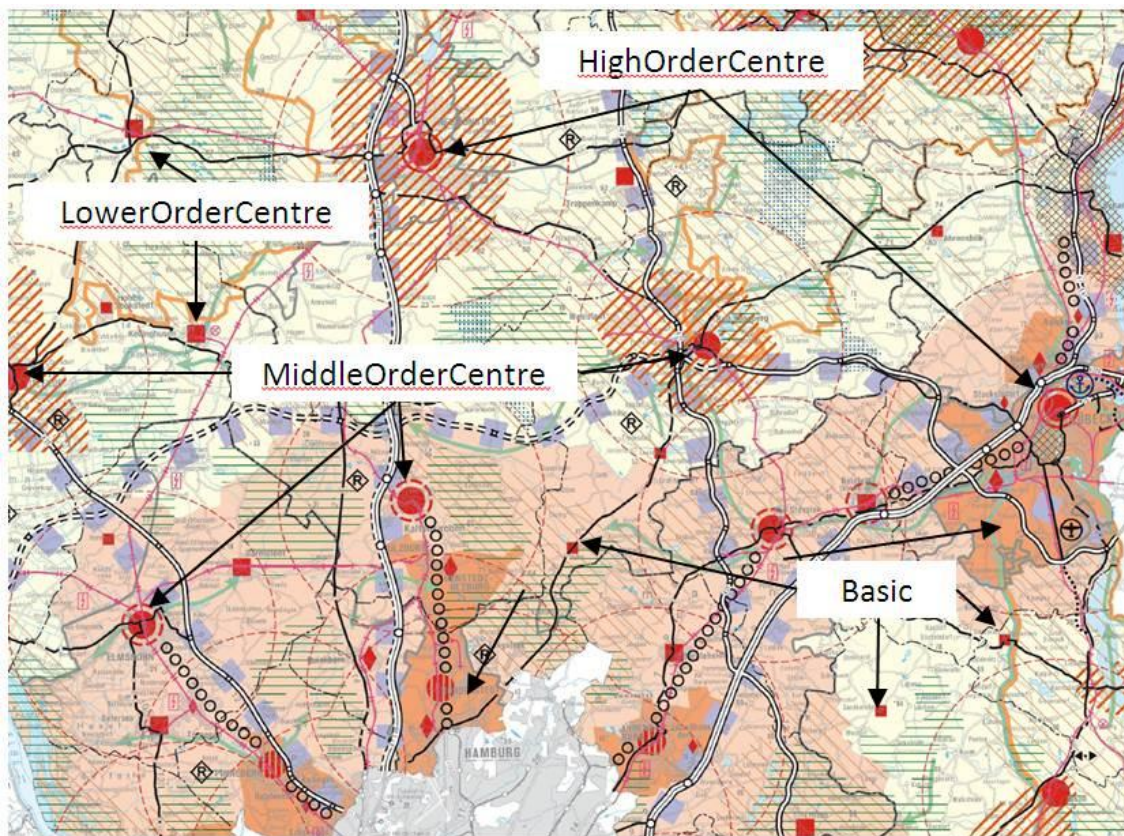
Municipalities are autonomous and responsible for spatial planning in their territory according to the principles and guidelines defined by higher levels.

Spatial plans on regional and state level should contain e.g. specifications concerning the spatial structure, especially with respect to:

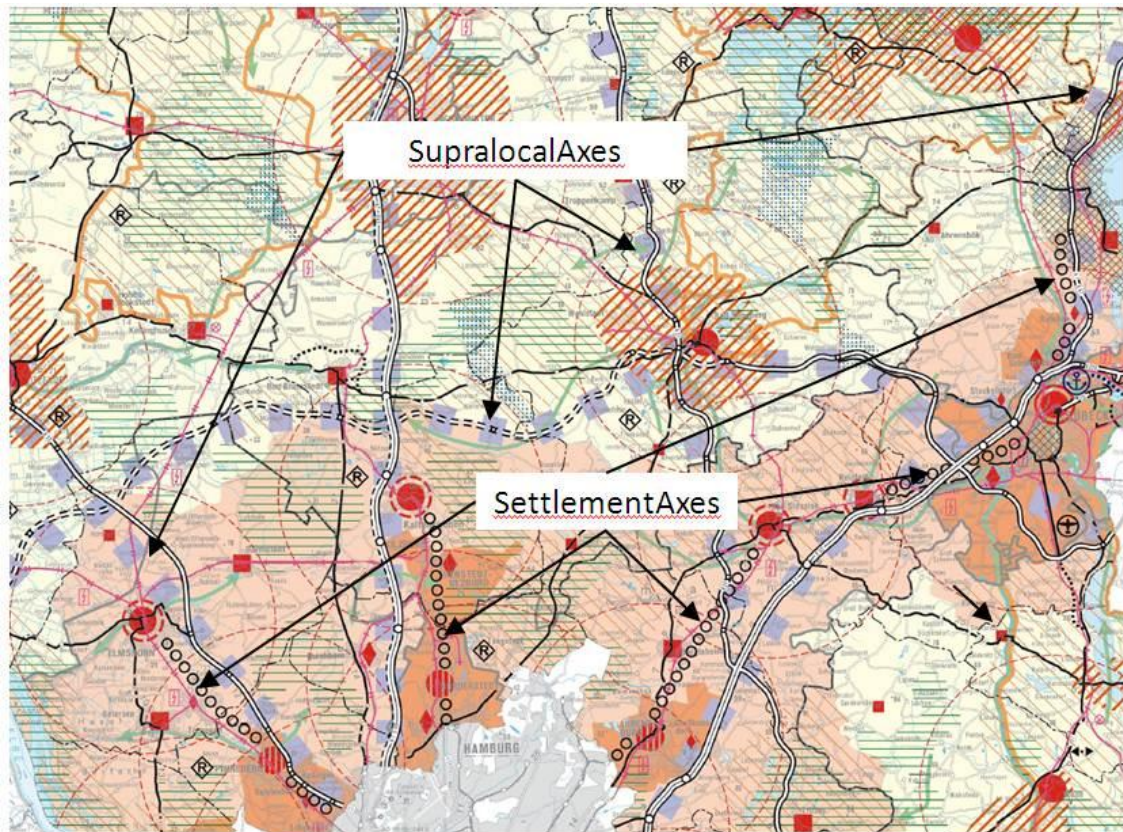
- the desired settlement structure (HSRCL code 7.1.) which may include
 - central places (HSRCL code 7.1.1.),
 - development axes (HSRCL code 7.1.2.),
 - assignment of functions (HSRCL code 7.1.3.),
 - spatial order categories (HSRCL code 7.1.4.),
- the desired open space structure (HSRCL code 7.2.) which may include
 - inter-regionally significant open spaces (HSRCL code 7.2.1. – 7.2.6.),
 - uses of open space, such as sites designated to safeguard supplies of and
 - systematically search for and extract location-specific raw materials (HSRCL code 7.2.7.),
- the desired infrastructure locations and routes (HSRCL code 7.3.) which may include
 - traffic infrastructure and installations for transfer of goods (HSRCL code 7.3.1.)
 - public utility and waste disposal infrastructure (HSRCL code 7.3.2.).

Using the state development plan of the northern German state of Schleswig-Holstein as an example the following pictures exemplarily illustrate a mapping from national spatial regulations (such as desired settlement structure) to the INSPIRE HSRCL codes.

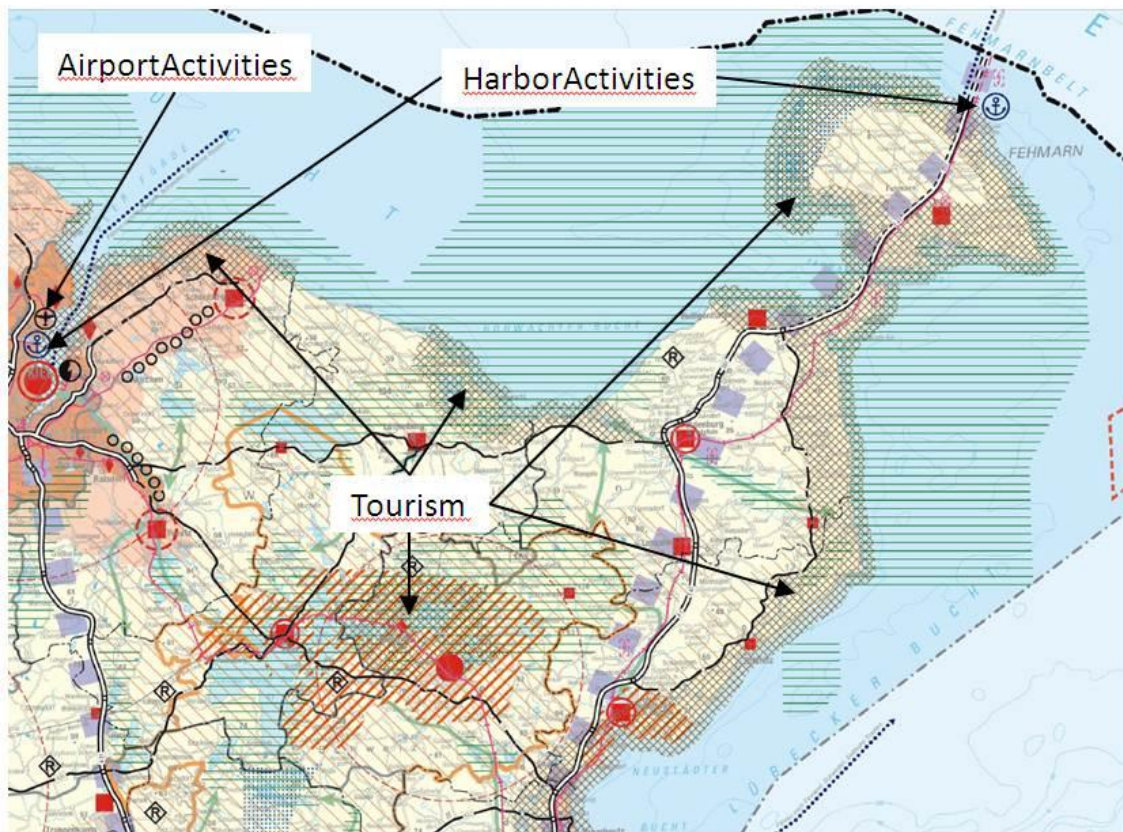
7.1.1. CentralPlaces



7.1.2. Axes



7.1.3. AssignmentOfFunctions



7.1.4. SpatialOrderCategories

