

LPIS Quality Assurance Framework

Based on JRC IES/H04/P/PMI/pmi D(2011)(13520)

history: this doc started as annex to JRC IPSC/G03/P/WDE/wde D(2009)(10581)

ANNEX III

Executable Test Suite (ETS)

The Concept of land cover and “eligible hectares” version 6.4

July 2019

Release notes

- changes/updates from version 6.3 2018
 - Point 7.1.1: Reference is given to the technical guidance on pro rata
 - Point 7.1.2, Systematic approach: It is specified that the percentage of scattered features (as basis for the reduction coefficient) should be reported in the LCCS code.
 - Point 7.1.3, Sporadic approach: It is specified that individual estimation of the percentage can be applied also on an individual grassland present within the reference parcel.

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1 Land Cover and Land Use

- 1.1.1 The current CAP Regulation categorize land for establishing the relevant agriculture area for declaration under direct payments (“eligible hectares”), or lodging payment claim for the rural development. The next step is to translate these concepts into a practical methodology.
- 1.1.2 In general, there are two approaches to describe and map land: the concept of land cover and of land use. Both concepts are defined in the INSPIRE Directive (EC) 2007/2:
- 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 characterized according to its **current and future planned functional or socio-economic purpose** (e.g. residential, industrial, commercial, agricultural, forestry, recreational).
- 1.1.3 The CAP Regulations use both concepts; the “Eligible Hectares” are clearly land cover oriented, while other qualifying conditions for a particular aid application are referring to the farmer’s socio-economic activity and are therefore land use oriented.
- 1.1.4 For spatial mapping to measure agricultural land and correspondent eligibility, the land cover concept has strong advantages over the land use one, as:
- It provides unambiguous and detailed characterization of Earth surface, solely based on the physiognomic – structural (biotic or abiotic) aspect of the land.
 - It is the easiest identifiable indicator of human interventions on the land and the resulting changes.
 - It is the main feature constraining the use of land.
- 1.1.5 A land cover classification would thus be the preferred instrument to identify the potential eligibility.
- 1.1.6 Not surprisingly, land cover is also a critical theme for environmental databases, as the land cover is the basic geographic phenomenon indicative for many environmental processes and change in the land cover is a priority of environmental policies.
- 1.1.7 By contrast, the land use concept implementation, indicative of the relationship (e.g. claim or declaration) between a farmer and a particular land is strongly conditioned by local traditions. A common pan-European mapping approach for measuring land use at CAP scale would probably result in a simple kind of “rural cadastre” with a multitude of users and uses per parcel and would not allow assessing LPIS performance within the required resolution. In general, it is hardly

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possible to directly assess land use aspects by mapping, although in agricultural areas, some information can often be derived from single observation of land cover (traces from tillage, presence of crop). Land use aspect may however be studied by collecting and analysing information from relevant attributes within the IACS database.

2 A common classification

2.1.1 The EU Member States are currently using different conceptual frameworks in order to define and map agriculture land and quantify the correspondent eligibility, combining land cover and land use-related approaches and resulting in different classes, categories and legends, which in some cases are understandable only in a strict country-related context. This is a result of the variety of landscapes, climate, agriculture practices, land management approaches across Europe.

2.1.2 For a common Quality Assessment Framework, there is a crucial need for a universal identification and classification of the land cover classes. JRC proposes to use the FAO Land Cover Classification System (LCCS) to “map” the land potentially eligible for payment. Although the LCCS covers all possible land cover classes, our focus here mainly lies on the category “Cultivated and Managed Terrestrial Areas”. This category can be further subdivided into land cover classes using specific classifiers as illustrated by Figure 1.

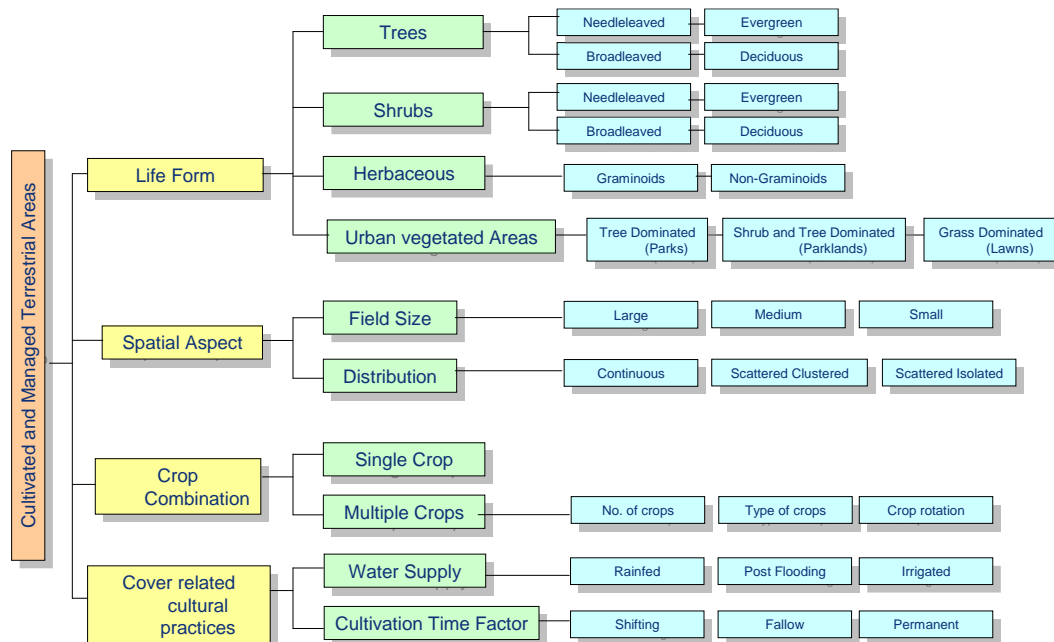


Figure 1: Classifiers within the LCCS “Cultivated and Managed Terrestrial Areas”

2.1.3 Figure 1 presents the “**land cover-related classifiers**”, used to describe any given class. They are the basic elements in LCCS applied for the semantic description of the land cover. Those with an * are mandatory, while the others are

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optional. The use of the later depends on the level of information available on the nature of the land cover and on the application needs (fit to purpose). Additionally, LCCS also provides other classifiers, which could further emphasize or highlight particular properties, not directly related to the physiognomic aspect of the surface. They are called “**LCCS attributes**” and are categorized in two groups – 1) Environmental and 2) Technical.

2.1.4 The LCCS attributes relevant for Category “Cultivated and Managed Terrestrial Areas” are given below:

- Environmental
 - Landform
 - Lithology
 - Soils
 - Climate
 - Altitude
 - Erosion
 - Crop Cover
 - Crop Growing Length (for Herbaceous only)
 - Crop Seeding time (for Herbaceous only)
- Technical
 - Crop Type (≠ “Type of crops” classifier)

2.1.5 In respect to the proper detection of the cultivated land, the date of observation is important - the land might be ploughed, sown or harvested (with no crop actually visible) or, by contrast, a crop can be clearly visible and even crop growth stages can be identified. These temporal variations influence the land cover appearance but should not influence its nature or description, because the area should be **classified independent of the time of observation**. For this reason, in the definition of “Cultivated Areas” in LCCS, provision is made for the known fact that a vegetative cover is not always present.

2.1.6 For some land cover types, specified in the CAP regulation (e.g. natural grassland, self-sown grass), the set of classifiers from LCCS category “Natural and Semi-Natural Terrestrial Vegetation” is appropriate, as they more accurately represent the physiognomic-structural aspect of these CAP definitions. This is particularly applicable for some nation-specific cases of land cover with non-herbaceous vegetation that supports pastoral activity (e.g. low productivity grassland or grassland with shrubs).

2.1.7 All land cover categories, constituting agriculture land that can enable the activation of “eligible hectares” in the CAP Regulations can so be expressed in the LCCS language, including the exceptional particular cases, found in some EU Member States.

2.1.8 The version of LCCS currently used in the ETS is 2.4.5.

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3 Eligible landscape elements

3.1.1 Apart from the main eligible hectares, some ecologically valuable landscape elements can potentially also be eligible. These elements are eligible under the condition of their retention, subject to explicit GAEC legislation of the individual Member States and their spatial context in which the feature is found.

3.1.2 The possible landscape elements represent land cover features, subject to specific mapping instructions.

- hedges --> linear
- ponds --> polygon
- ditches --> linear
- trees in line, --> linear
- trees in group --> polygon
- isolated tree --> point
- field margins --> linear

3.1.3 EU Member State Administrations should provide the list of eligible landscape feature and their definition, together with the LCCS description, as a part of the Eligibility Profile. The mapping instructions, portrayal specifications and the rules for the calculation of their eligible area, if available in the given LPIS implementation (SUT) should be reflected in the MTS conformance testing log file, as part of the MTS reporting package. They can be optionally recorded and provided as part of the in the Implementation Conformance Statement (ICS). Landscape elements traditionally part of the agricultural practice, are by default not in the scope of quality measures 10104 and 10104_2, and should not be included in the Eligibility profile.

4 Proposed list of agriculture land cover classes and landscape elements

4.1.1 Table 1 (given at the end of the document) comprises a list of land cover classes and landscape element types, designed with FAO LCCS, which can be used to describe and represent eligible area, according to the definitions given in the current CAP Regulations. A separate column “**Representation of eligible land**” is introduced, which classifies each land cover type, according to its “ability” to represent the eligible land:

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- YES: the given class represents “single” land cover and its semantic concept is sufficient to unambiguously describe “pure” eligible land
- PRO RATA: the given class represents “mixed” land cover and its semantic concept could be sufficient to unambiguously describe those cases of eligible land, where reduction coefficient need to be applied to calculate the maximum eligible area

CONDITIONAL: the given class represents “single” or “mixed” land cover and its semantic concept is not sufficient to unambiguously describe eligible land, without supplementary information from the national legislation and local context.

This option is mandatory for landscape features that are subject to ETS.

4.1.2 The proposed list and structure is intended to guide further discussions and to serve as a template for an EU Member State defining and describing the land cover types, representing eligible land.

4.1.3 For the land cover classes eligible under the specific conditions of Reg 1307/2013, Art 32 (2)(b), as well as those under new definition of permanent grassland where grasses and other herbaceous forage are not predominant or are absent (as amended by Art.3 of 2393R2017), special procedures need to be developed. Although a variety of land cover classes (in particular “natural habitats”) can be conceived, all can and should ultimately be defined within the LCCS system. EU MS are invited to provide the description of these specific land cover types, if they occur on their territory.

5 Eligibility profile

5.1.1 The **maximum eligible area** is the officially known and recorded maximum quantity of agriculture land per reference parcel based on which, following Art. 72 of Reg. 1307/2013, an aid application can be lodged and payment can be made. It is derived from the available agriculture land (and associated landscape features), defined from a strict land cover perspective. The ETS checks the correctness of this agriculture land recorded for every reference parcel that form part of the agriculture holding, regardless whether it is declared for BPS/SAPS aid or for other use.

5.1.2 The eligibility profile is the conversion table allowing raw ETS observations (mapped land cover features) to be expressed in eligibility terms. Eligibility is relevant for the calculation of the **maximum eligible area** and for counting the presence of ineligible features. It provides the correct quantitative determination within a single methodology by joining the common pan-European qualitative aspect of the land cover features with the national rules and supporting schemes

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applied to the measured areas. In other words, it converts the results of the land cover mapping into “agriculture land found” and further towards “eligible hectares or eligible features found”.

5.1.3 Although every aid scheme involves its particular eligibility profile and each profile can be applied to the common and unique land cover mapping, the following paragraphs, elaborate on the IACS eligibility profile for the direct aids schemes (BPS and SAPS) only.

5.1.4 A template for the eligibility profile (BPS and SAPS) can be found in Table 2, which is derived from Table 1 and where a column “**Eligible Hectare factor**” is added. It determines how the agriculture land and its correspondent potentially eligible area is calculated for a mapped land cover feature, described by the given land cover (LCCS) class:

- 100%: the potentially eligible area equals to the geometric area of the digitized (mapped) land cover feature
- A single value between 0% and 100%: the potentially eligible area is a pre-defined percentage from the geometric area of the digitized (mapped) land cover feature. The value depends on the nature of the land cover class (its semantic description), national rules for the supporting schemes and specific agriculture practices.

Note: There shall no be permanent grasslands with value "0%" reported in the eligible profile, as such land cover types fall into any of the non-agricultural categories from Table 4. Permanent grasslands with value "100%" can be reported in the eligibility profile, providing that the percentage of the scattered non-agriculture features for the particular land cover type is up to 10%.

- 0% or 100%: the potentially eligible area is either 0 or 100% from the physical area of the digitized (mapped) land cover feature, depending on the rules in the national legislation and the country (or region)-specific agriculture practices.

5.1.5 The “**0% or 100%:**” factor requires a feature by feature assessment during the ETS. The “100% potentially eligible area” factor can be applied mechanically on all occurrences of the land cover class (LCCSCode).

5.1.6 The eligibility profile should include also the eligible landscape features, but **only those, that are subject to retention**¹.

5.1.7 In addition, specific land cover classes are introduced, that do not represent agricultural area, taken by arable land, permanent grassland or permanent crop, but can represent eligible hectares for historical reasons:

¹ GAEC 7 of Annex II, Reg. 1306/2013

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- a. One land cover class for the aquatic natural vegetation under RDP, following the definition for natural habitat given in Art.1(b) of Council directive 92/43/EEC of 21.05.1992.
 - b. One forest class, defined as afforested former agriculture area with open medium high trees, in order to take into account the tree high growth in the last 10-15 years after planting.
- 5.1.8 The eligibility profile does not contain any non-agricultural and non-eligible land cover classes. The ETS also does not require dedicated and individual delineation of these non-agriculture features, nor a detailed inventory of their land cover type. The occurrence and abundance of the non-agriculture features is reported in quality measure 10105 at general level – all individual features are reported as points and further grouped in six general non-agriculture land cover categories. Their LCCS codification and definition is provided in Table 4, at the end of this document, as informative reference, in order to help the ETS operators in their interpretation work.

6 Application instruction for the LPIS quality inspection

- 6.1.1 To enable the LPIS quality inspector to easily implement the LPIS quality activity diagram, an appropriate (LCCS compliant) legend and eligibility profile should be prepared for the implementation under test (see MTS).
- 6.1.2 The elaboration of nation-specific land cover legend involves the following steps:
- Identify from Figure 1 what land cover criteria are relevant for your region/country
 - Identify what kind of “pure”, “pro rata” and “conditional” land cover classes you need to define and describe. Use, as much as possible, the pre-defined classes from Table 2 (last page).
 - Remove all unnecessary classes from Table 2 not relevant for your case
 - In exceptional cases, when Table 2 is not holding all your agricultural land cover classes, representing eligible land:
 - a. provide the description of the specific land cover classes (that is missing in Table 2) and the motivation for their agriculture character and correspondent potential eligibility in a separate document.
 - b. code each added class sequentially as Zxxx1, Zxxx2, Zxxx3, with xxx the paying agency’s abbreviation. This makes them well distinguishable from the already available LCCODE classes.
 - c. ask JRC to provide the correct LCCS-LCCODE and the appropriate Table 2 records for all local Z-classes as based on your description (a).
- 6.1.3 An eligibility profile involves the following steps:

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- Assign to each of the land cover classes defined in the previous step, the relevant principle (formula) for the calculation of the potentially eligible area, according to the national legislation, country-related agriculture practices and supporting schemes applied.
- 6.1.4 Document the resulting classes so that an unambiguous CAPI delineation can be made. Use the information provided in the column “**Land Cover Class Definition**” from the eligibility profile (Table 2), combined with any of your additional user-defined classifiers, to develop the interpretation key and the mapping legend for the land cover delineation during the ETS. If considered appropriate, translate these units to a national legend for your inspector’s convenience.
- 6.1.5 The level of detail of the land cover interpretation, that needs to be achieved by the operator for each class, must at minimum represent the aggregated level of land cover identified in the CAP Regulations. These are given in the fields of column “**Minimum Mapping Legend**”, which are the legend entries that should reflect the categories of agricultural land potentially eligible in absence of coupled payment in terms of LCCS codes. If the information in the column “**Land Cover Class Definition**” or “**Minimum Mapping Legend**” is considered insufficient for your mapping purposes, ask JRC for further clarification.
- 6.1.6 This minimum mapping legend distinguishes the following entries.
- A arable land
 - G permanent grassland
 - N natural grassland
 - H greenhouse
 - T permanent tree crop
 - S permanent scrub crop
 - C permanent herbaceous crop
 - P short rotation coppice (plantation, P1-Deciduous Tree Crop(s) and P2-Evergreen Tree Crop(s))
 - R (irrigated) rice
 - K kitchen gardens (SAPS only)
 - HV herbaceous vegetation (ETS workaround see 6.1.8)
 - XB Waterlogged natural vegetation under Art. 32(2)(b) of 1307R2013
 - YA Afforested areas under Art. 32(2)(b) of 1307R2013
- 6.1.7 Any polygons delineated during the inspection can only be coded with the above legend codes complemented with a user-defined legend entry, which cannot conflict with any of the pre-defined legend codes above. The Member State shall

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report its user-defined legend entries (for their specific land cover types and their landscape features) in its eligibility profile in the MTS package. They should be expressed with maximum two capital letter abbreviation (numbers from “1” to “9” for the second letter are allowed).

6.1.8 For application of the classification correctness test, the applicable minimum legend codes shall be grouped into three agricultural land cover categories as

- A arable land AL
- G permanent grassland PG
- HV herbaceous vegetation AL or PG (case dependent)
- N natural grassland PG
- H greenhouse AL
- T permanent tree crop PC
- S permanent scrub crop PC
- C permanent herbaceous crop PC
- P short rotation coppice PC
- R (irrigated) rice AL
- K kitchen gardens (SAPS only) AL

The codes AL, PG and PC stand for the categories of arableLand, permanentGrassland and permanentCrop respectively as in the codelist AgriculturalLandTypeValue (see MTS). Sensitive permanent grasslands and permanent grasslands with established local practices are coded as PG for this exercise. For those grasslands where it is impossible to identify the permanent (code G) or temporary (code A) nature from the reference orthoimagery and ancillary information used in the ETS, the observation can be limited to the delineation of the observed herbaceous vegetation (code HV), to be recoded later on a “polygon by polygon” basis. This recoding workaround can also be applied in cases of permanent pasture, temporary grassland, and fallow land (as part of the arable land), **but only** where proper classification and attribution to either AL or PG is impossible.

6.1.9 A general overview of the ETS analysis and decision workflow from land cover mapping to calculation of the eligible area, is given on Figure 2.

7 Pro-rata eligibility

7.1.1 Member States shall respect the framework set out in the technical guidance on pro rata grasslands (TG Pro Rata)² when dealing with permanent grassland with scattered ineligible features.

² https://marswiki.jrc.ec.europa.eu/wikicap/index.php/LPIS_TG_PR

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- 7.1.2 Member States using systematic pro rata method shall include their resulting pro-rata classes in their eligibility profile. The value for the pro rata category that corresponds to the given pro rata land cover class ([and reported in the LCCS code](#)) should be introduced as a value in the attribute <eligibility hectare factor> in the eligibility profile.
- 7.1.3 Member States using sporadic pro rata method (with a reduction coefficient not linked to particular land cover class, but derived individually for each RP [or grassland feature within](#)), shall report that pro rata grassland in the eligibility profile using a land cover class that reflects the nature of the “grassland mixture” on their land. No quantification of the prevalence of each mixture component (i.e. the basis for the reduction coefficient) is [reported](#) in the LCCS code of that class. In such case, the entry for the element “Eligible Hectare Factor” should be “NaN”³.
- 7.1.4 MS shall use, where applicable, the corresponding pro rata categories of the TG Pro Rata as eligibility profile entry for the value <eligibility hectare factor>. Wherever the eligibility hectare factor does not match these TG categories, user-defined pro rata categories shall be introduced. For each occurring pro rata category (pre-defined or introduced by the MS), the MS shall add a separate land cover class entry with its particular value for eligibility hectare factor.

8 Individual parcel eligibility reductions

- 8.1.1 During OTSC driven RP updates, member states may have attributed maximum eligible area values based on field assessment methods, which cannot be reproduced by the ETS methodology. A scorecard assessment is a widespread example of this approach and yields a value that not based on a delineation of terrain features.
- 8.1.2 In the ETS, these parcels should be flagged to ensure they are out of scope of the area purity measure. They are however inspected as any other reference parcel and the resulting measurement results are fully applicable for all sample-based measures.

9 DISCLAIMER

The receipt confirmation for a formally correct eligibility profile, issued in the framework of the exchange of technical data during the annual LPIS quality assessment, does not constitute an explicit or tacit approval from the services of the European Commission regarding the interpretation of eligibility of land made by the Member State within that particular profile.

³ <https://www.w3.org/TR/xmlschema-2/#float-lexical-representation>

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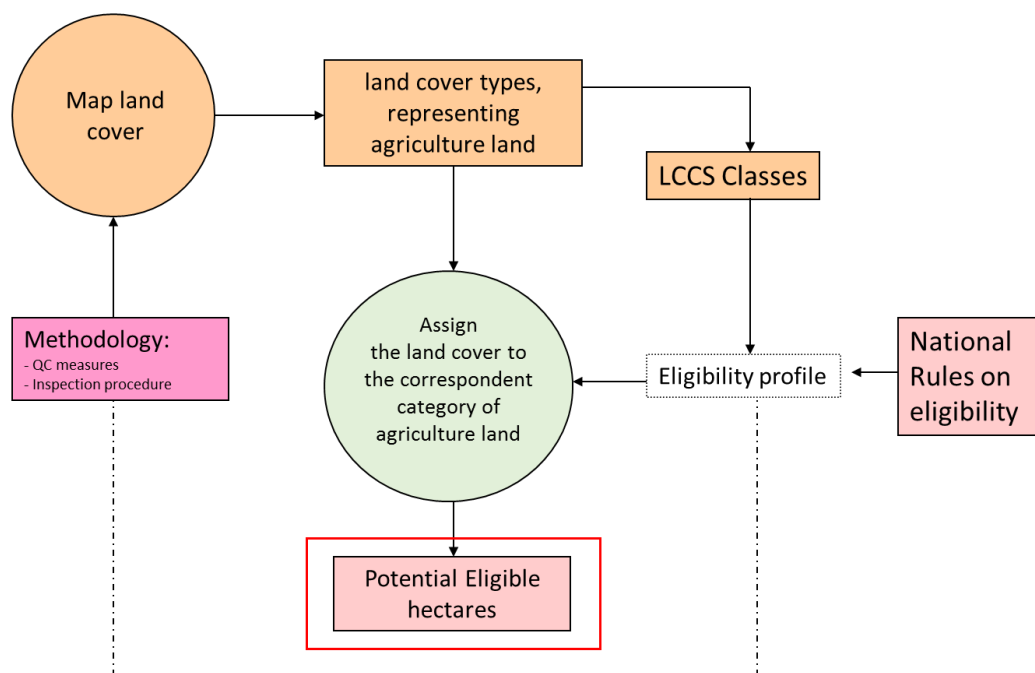


Figure 2: General overview of the ETS analysis and decision workflow

10 References

- Land Cover Classification System (LCCS) 2: http://www.glc.n.org/sof_1_en.jsp
- Land cover and Eligibility :
http://mars.jrc.ec.europa.eu/mars/News-Events/MARS-Conference-2008/Agenda-and-Presentations/T5_Devos_Eligibility_JRC_revised.pdf

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Table 1: Proposed matching description of potentially eligible land under EU CAP with the LCCS semantic description (examples)

Land Cover Class	Land cover Class Definition	LCCCode	Representation of eligible land (direct aid) (Yes/Pro rata/Conditional)
Arable Land (general)	Continuous Field(s) Of Herbaceous Crop(s).	10099	YES
Arable Land (rainfed with fallow system)	Herbaceous Crop(s) ., With Fallow System	10660	YES
Arable Land (temporary resting)	Shifting Cultivation Of Herbaceous Crop(s)	10224	YES
Arable Land with Patches of Scattered Trees (up to 4% of the surface)	Herbaceous Crop(s) ., With Fallow System / Scattered Trees And Sparse Herbaceous	10660 / 20505-9032	YES
Agriculture with Cultivated Trees (intercropping)	Rainfed Herbaceous Crop(s) / Permanently Cropped Area With Rainfed Tree Crop(s)	10222 / 11492	YES
Permanent pasture (sown)	Permanently Cropped Area Graminoid Crop(s) Dominant Crop: Fodder - Fodder grasses	10822-S0701	YES
Permanent pasture (self-seed)	Closed Medium To Tall Grassland, Single Layer Floristic Aspect: Groups of Plant Species	20439-12763-T2	YES
Permanent pasture (self-seed with shrubs)	Medium To Tall Grassland With Medium High Shrubs Floristic Aspect: Groups of Plant Species	20443-13151-T2	PRO RATA
Permanent pasture (self-seed with sparse trees)	Medium To Tall Grassland With Low Trees Floristic Aspect: Groups of Plant Species	20440-13149-T2	PRO RATA
Kitchen Gardens	Permanently Cropped Area With Small Sized Field(s) Of Irrigated Non-Graminoid Crop(s).	11135	YES (SAPS only)
Permanent crops (orchards)	Permanently Cropped Area With Rainfed Tree Crop(s); Crop Type: Fruits&Nuts; Crop Cover: Orchard(s)	10153-S6W8	YES
Permanent crops (plantation)	Permanently Cropped Area With Rainfed Tree Crop(s); Crop Cover: Plantation(s)	10153-W7	YES
Permanent crops (shrub type)	Permanently Cropped Area With Rainfed Shrub Crop(s)	10188	YES
Permanent crops (soft fruits)	Permanently Cropped Area With Rainfed Shrub Crop(s); Crop Type: Soft Fruits	10188(2)[Z12]	YES

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Permanent crops (vineyards)	Permanently Cropped Area With Rainfed Broadleaved Deciduous Shrub Crop(s) Dominant Crop: Fruits & Nuts - Grapes (<i>Vitis vinifera</i>)	10566-1891-S0610	YES
Permanent crops (olive trees)	Permanently Cropped Area With Rainfed Broadleaved Evergreen Tree Crop(s) Dominant Crop: Industrial Crops - Olive (<i>Olea europaea</i> L.)	10494-1-S0910	YES
Tree plantation (short rotation coppice)	Permanently Cropped Area With Rainfed BroadLeaved Deciduous Tree Crop(s), Permanently Cropped Area With Rainfed BroadLeaved Evergreen Tree Crop(s) Dominant Crop: Wood and Timber – Eucalypt (<i>Eucalyptus</i> spp.) Crop Cover: Plantation(s)	11347-1891-S1004S1099Zs3S1099Zs4W7(1)[Z15Z16], 11342-1-S1002(1)[Z15Z16]	YES
Cotton Fields	Permanently Cropped Area With Rainfed Shrub Crop(s); Dominant Crop: Industrial Crops - Cotton (<i>Gossypium</i> spp.)	10188-S0903	YES
Rice fields	Graminoid Crops On Permanently Flooded Land; Dominant Crop: Cereals - Rice (<i>Oryza</i> spp.)	30001-S0308	YES
Starch Potatoe	Permanently Cropped Area Non-Graminoid Crop(s); Dominant Crop: Roots and Tubers - Potato (<i>Solanum tuberosum</i> L.)	11002-S0402	YES
Sugar beet	Permanently Cropped Area Non-Graminoid Crop(s); Dominant Crop: Roots and Tubers - Beetroot (Sugar beet)	11002-S0499Zs1	YES (SAPS only)
Pulses and Vegetables	Irrigated Non-Graminoid Crop(s) ; Crop Type: Pulses and Vegetables	11030-S5	YES
Greenhouses	Industrial And/Or Other Area(s)	5003-8-A44Zp10	YES
Waterlogged natural or semi-natural vegetation developed on former agriculture land due to the implementation of Art. 32(2)(b)(i) of R1307/2013	Closed to Open Woody Vegetation With Herbaceous Vegetation On Waterlogged Soil	41632(3)[Z20]	CONDITIONAL
Afforested former agriculture land - implementation of Art. 32(2)(b)(ii) of R1307/2013	Open Medium High Trees (Woodland)	13233(3)[Z21]	CONDITIONAL

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Landscape Elements			
Field margins (sparsely vegetated)	Bare Soil And/Or Other Unconsolidated Material(s) Scattered Vegetation: Scattered Vegetation Present	6005-U1(3)[Z7]	CONDITIONAL
Stone Walls	Linear Built Up Area(s) Built-up object: Other – stone wall	5002--A44Zp1	CONDITIONAL
Hedgerows	Permanently Cropped Area With Small Sized Field(s) Of Rainfed Tree Crop(s) // Permanently Cropped Area With Small Sized Field(s) Of Rainfed Shrub Crop(s)	10176(3)[Z1] // 1021110285	CONDITIONAL
Ponds	Artificial Waterbodies (Standing) Scattered Vegetation: Scattered Vegetation Present	7001-5-U1(3)[Z2]	CONDITIONAL
Ditches	Artificial Waterbodies (Flowing) Scattered Vegetation: Scattered Vegetation Present	7001-1-U1(3)[Z3]	CONDITIONAL
Row of trees	Row of trees Floristic Aspect: Groups of Plant Species	20282-T2(3)[Z4]	CONDITIONAL
Patches of trees	Patches of trees Floristic Aspect: Groups of Plant Species	20282-T2(3)[Z5]	CONDITIONAL
Single tree	Single tree Floristic Aspect: Single Plant Species	20274-T1(1)[Z11]	CONDITIONAL
Field margins	Closed Herbaceous Vegetation, Single Layer	20409(3)[Z7]	CONDITIONAL

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Table 2: Semantic description of land cover classes and landscape elements, which can represent eligible land (**direct aid**)

- **Bold** typeface: represents archetype or pure land cover classes as defined in the CAP Regulations.
- Normal typeface: represents heterogeneous or “coupled crops” land cover classes

Land Cover Class	Land cover Class Definition	Minimum Mapping Legend	User-defined Legend Code	LCCCode	Representation of eligible land (direct aid) (Yes/Pro rata/Conditional)	Eligible Hectare factor (as percentage of the geometric area of the mapped feature)
Arable Land (general)	Continuous Field(s) Of Herbaceous Crop(s).	Arable land	A	10099	YES	100%
Arable Land (rainfed with fallow system)	Herbaceous Crop(s) ., With Fallow System	Arable land	A1	10660	YES	100%
Arable Land (temporary resting)	Shifting Cultivation Of Herbaceous Crop(s)	Arable land	A2	10224	YES	100%
Arable Land with Patches of Scattered Trees (up to 4% of the surface)*	Herbaceous Crop(s) ., With Fallow System / Scattered Trees And Sparse Herbaceous	Arable land	A3	10660 / 20505-9032	YES	100%
Agriculture with Cultivated Trees (intercropping)	Rainfed Herbaceous Crop(s) / Permanently Cropped Area With Rainfed Tree Crop(s)	n/a	tbd	10222 / 11492	YES	100%
Permanent grassland (self-seed or sown)	'Closed Medium To Tall Grassland, Single Layer Floristic Aspect: Groups of Plant Species	Herbaceous vegetation	HV	20439-12763-T2	YES	100%
Permanent natural grassland (self-seed)	Closed Medium To Tall Grassland, Single Layer Floristic Aspect: Groups of Plant Species	Natural Grassland	N	20439-12763-T2	YES	100%

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Permanent grassland (sown)	Permanently Cropped Area Graminoid Crop(s) Dominant Crop: Fodder - Fodder grasses	Grassland	G	10822-S0701	YES	100%
Permanent pasture (self-seed with shrubs)	Medium To Tall Grassland With Medium High Shrubs Floristic Aspect: Groups of Plant Species	n/a	tbd	20443-13151-T2	PRO RATA	Single value between 0% and 100%
Permanent pasture (self-seed with sparse trees)	Medium To Tall Grassland With Low Trees Floristic Aspect: Groups of Plant Species	n/a	tbd	20440-13149-T2	PRO RATA	Single value between 0% and 100%
Kitchen Gardens	Permanently Cropped Area With Small Sized Field(s) Of Irrigated Non-Graminoid Crop(s).	Kitchen garden	K	11135	YES (SAPS only)	100%
Permanent crops (tree type)	Permanently Cropped Area With Rainfed Tree Crop(s)	Permanent Tree crop	T	11492	YES	100%
Permanent crops (orchards)	Permanently Cropped Area With Rainfed Tree Crop(s); Crop Type: Fruits&Nuts; Crop Cover: Orchard(s)	Permanent Tree crop	T1	10153-S6W8	YES	100%
Permanent crops (plantation)	Permanently Cropped Area With Rainfed Tree Crop(s); Crop Cover: Plantation(s)	Permanent Tree crop	T2	10153-W7	YES	100%
Permanent crops (olive trees)	Permanently Cropped Area With Rainfed Broadleaved Evergreen Tree Crop(s) Dominant Crop: Industrial Crops - Olive (<i>Olea europaea</i> L.)	Permanent Tree crop	T3	10494-1-S0910	YES	100%
Permanent crops (shrub type)	Permanently Cropped Area With Rainfed Shrub Crop(s)	Permanent Shrub crop	S	10188	YES	100%
Permanent crops (soft fruits)	Permanently Cropped Area With Rainfed Shrub Crop(s); Crop Type: Soft Fruits	Permanent Shrub crop	S1	10188(2)[Z12]	YES	100%
Permanent crops (vineyards)	Permanently Cropped Area With Rainfed Broadleaved Deciduous Shrub Crop(s) Dominant Crop: Fruits & Nuts - Grapes (<i>Vitis vinifera</i>)	Permanent Shrub crop	S2	10566-1891-S0610	YES	100%

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Permanent crops (hops)	Permanently Cropped Area Non-Graminoid Crop(s) Dominant Crop: Beverage - Hops (Humulus lupulus L.)	Permanent Herbaceous crop	C	11404-S0803	YES	100%
Cotton Fields	Permanently Cropped Area With Rainfed Shrub Crop(s); Dominant Crop: Industrial Crops - Cotton (Gossypium spp.)	Permanent Shrub crop	S3	10188-S0903	YES	100%
Rice fields	Graminoid Crops On Permanently Flooded Land; Dominant Crop: Cereals - Rice (Oryza spp.)	Permanently flooded crop	R	30001-S0308	YES	100%
Starch Potatoe	Permanently Cropped Area Non-Graminoid Crop(s); Dominant Crop: Roots and Tubers - Potato (Solanum tuberosum L.)	Arable land	A4	11002-S0402	YES	100%
Sugar beet	Permanently Cropped Area Non-Graminoid Crop(s); Dominant Crop: Roots and Tubers - Beetroot (Sugar beet)	Arable land	A5	11002-S0499Zs1	YES (SAPS only)	100%
Pulses and Vegetables	Irrigated Non-Graminoid Crop(s) ; Crop Type: Pulses and Vegetables	Arable land	A6	11030-S5	YES	100%
Greenhouses	Industrial And/Or Other Area(s)	Greenhouse	H	5003-8-A44Zp10	YES	100%
Waterlogged natural or semi-natural vegetation developed on former agriculture land due to the implementation of Art. 32(2)(b)(i) of R1307/2013	Closed to Open Woody Vegetation With Herbaceous Vegetation On Waterlogged Soil	Waterlogged natural vegetation under Art. 32(2)(b) of 1307R2013	XB	41632(3)[Z20]	CONDITIONAL	0% or 100%
Afforested former agriculture land - implementation of Art. 32(2)(b)(ii) of R1307/2013	Open Medium High Trees (Woodland)	Afforested areas under Art. 32(2)(b) of 1307R2013	YA	13233(3)[Z21]	CONDITIONAL	0% or 100%

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Short Rotation Coppice – broadleave deciduous (definition 2013, revised)	Permanently Cropped Area With Rainfed BroadLeaved Deciduous Tree Crop(s)	Tree plantation	P1	11347-1891-S1004S1099Zs3S1099Zs4W7(1)[Z15Z16]	YES	100%
Short Rotation Coppice – broadleave evergreen (definition 2013, revised)	Permanently Cropped Area With Rainfed BroadLeaved Evergreen Tree Crop(s) Dominant Crop: Wood and Timber – Eucalypt (Eucalyptus spp.) Crop Cover: Plantation(s)	Tree plantation	P2	11342-1-S1002(1)[Z15Z16]	YES	100%

*: assuming less than 100 trees/ha

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	Landscape Elements					
Field margins (sparsely vegetated)	Bare Soil And/Or Other Unconsolidated Material(s) Scattered Vegetation: Scattered Vegetation Present	n/a	tbd	6005-U1(3)[Z7]	CONDITIONAL	0% or 100%
Stone Walls	Linear Built Up Area(s) Built-up object: Other – Stone wall	n/a	tbd	5002--A44Zp1	CONDITIONAL	0% or 100%
Hedgerows	Permanently Cropped Area With Small Sized Field(s) Of Rainfed Tree Crop(s) // Permanently Cropped Area With Small Sized Field(s) Of Rainfed Shrub Crop(s)	n/a	tbd	10176(3)[Z1] // 1021110285	CONDITIONAL	0% or 100%
Ponds	Artificial Waterbodies (Standing) Scattered Vegetation: Scattered Vegetation Present	n/a	tbd	7001-5-U1(3)[Z2]	CONDITIONAL	0% or 100%
Ditches	Artificial Waterbodies (Flowing) Scattered Vegetation: Scattered Vegetation Present	n/a	tbd	7001-1-U1(3)[Z3]	CONDITIONAL	0% or 100%
Row of trees	Row of trees Floristic Aspect: Groups of Plant Species	n/a	tbd	20282-T2(3)[Z4]	CONDITIONAL	0% or 100%
Patches of trees	Patches of trees Floristic Aspect: Groups of Plant Species	n/a	tbd	20282-T2(3)[Z5]	CONDITIONAL	0% or 100%
Single tree	Single isolated tree Floristic Aspect: Single Plant Species	n/a	tbd	20274-T1(1)[Z11]	CONDITIONAL	0% or 100%
Field margins	Closed Herbaceous Vegetation, Single Layer	n/a	tbd	20409(3)[Z7]	CONDITIONAL	0% or 100%
Terraces	Bare Soil And/Or Other Unconsolidated Material(s) Major Land class: Steep Land Scattered Vegetation: Woody	n/a	tbd	6005-L3U2(1)[Z13]	CONDITIONAL	0% or 100%

Disclaimer: Given list of landscape feature is for illustration purpose only. The EU Member States should provide their nation or region-specific list of landscape features.

Note: A XSD scheme of Table 2 can be retrieved from <ftp://mars.jrc.ec.europa.eu/LPIS/Schemas/>.

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Table 3: Description of the fields in Table 2 (Eligibility Profile)

Column Name	Description	Data Type	Notes
Land Cover Class	User-defined name of the land cover class	TEXT	
Land Cover Class Definition	Brief Semantic Description of the land cover class, according to LCCS methodology	TEXT	To be used for the preparation of the interpretation keys for the CAPI
Minimum Mapping Legend	Minimum level of detail of the land cover interpretation, that needs to be achieved by the operator for each class.	TEXT	The Operator should be able to interpret and delineate at least to that level of detail of the land cover
User-Defined Legend code	User-defined legend entry, which is used by the operator to code the delineated land cover	TEXT	The Member State shall report its user-defined legend entries in its eligibility profile in the MTS Package.
LCCCode	Code of the land cover class, generated by the LCCS	TEXT	
Representation of eligible land (direct aid)	Classifies the land cover type, according to its “ability” to represent the eligible land	TEXT (multiple choice)	Yes/Pro rata/Conditional
Eligible Hectare factor	Determines how the eligible area is calculated for a mapped land cover feature, described by the given land cover (LCCS) class:	NUMBER (%)	As percentage of the geometric area of the mapped feature

NOTE: The reduction coefficient values of the "Eligible Hectare Factor" for the classes assigned as "pro-rata" or the interpretation of "conditional" eligibility have to be appropriately made in accordance with the definitions of the Regulations.

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Table 4: Codification and definition of the non-agriculture land cover types of quality measure 10105 in LCCS (from Table 6 of Annex I)

Land Cover Class	Land cover Class Definition	LCCCode
Artificial sealed surface and associated areas	Built Up Area(s) // Non Built Up Area(s) // Vegetated Urban Area(s)	5001 // 5004 // 11176
Forest and Woodland	Closed to Open Woodland with Shrubs and Emergents	21571
Scrubland	Closed to Open Thicket with Herbaceous and Emergents	21603
Water Bodies	Natural Waterbodies // Artificial Waterbodies	8001 // 7001
Natural Bare areas	Consolidated Material(s) // Unconsolidated Material(s)	6001 // 6004
Waterlogged Vegetation	Closed to Open Woody Vegetation With Herbaceous Vegetation On Waterlogged Soil	41632