LPIS Quality Assurance Framework

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

Executable Test Suite (ETS)

The Concept of land cover and "eligible hectares" version 5.3

May 2014

Release notes (modifications from version 5.3 2013)

➢ Chapter 8.1.6 has been extended – Short rotation coppice (added entries P1-Deciduous Tree Crop(s) and P2-Evergreen Tree Crop(s))

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1 Eligibility and crosschecks

1.1.1 The adjective eligible relates to the concept of "meeting the requirements or qualifications needed" or "qualified". Therefore the very content behind this concept can vary from article to article over the Regulation. The purpose of LPIS is to support administrative crosschecks as defined under Council Regulation (EC) 2009/73 Article 20 - Verification of eligibility conditions

1. Member States shall carry out administrative controls on the aid applications to verify the eligibility conditions for the aid.

1.1.2 In the pre- Health Check Council Regulation, (EC) 2003/1782 Article 23 Verification of eligibility conditions, this purpose was more explicitly phrased as

1. Member States shall carry out administrative checks on the aid applications including a <u>verification of the eligible area</u> and the corresponding payment entitlements.

2 Land types identified in the Council Regulation (EC) 2009/73

2.1.1 LPIS is the spatial register within IACS; it also identifies and quantifies agriculture land. Several articles of Council Regulation 2009/73 address the land types that need to be dealt with (i.e. identified, located and quantified). They are quoted below.

2.1.2 Art 2 Definitions

*(h) '**agricultural area**' means any area taken up by **arable land**, **permanent pasture**[1] or **permanent crops**.*

2.1.3 Art 34 Activation of payment entitlements per **eligible hectare**

*1/ any **agricultural area** of the holding,*

*2/ and any area planted with **short rotation coppice** (CN code ex 0602 90 41) that is (predominantly) used for agricultural activity*

*3/ any area which gave a right to payments under the single payment scheme or the single area payment scheme **in 2008** and which*

*(i) no longer complies with the definition of 'eligible' as a result of the implementation of Council Directive 79/409/EEC of 2 April 1979 on the conservation of wild birds (1), Council Directive 92/43/EEC of 21 May 1992 on the conservation of **natural habitats***

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[1] Commission Regulation 2009/1120: article 2: (d) 'grassland' shall mean arable land used for grass production (sown or natural); for the purposes of Article 49 of Regulation (EC) No 73/2009 **grassland shall include permanent pasture**;

and of wild fauna and flora (2) and 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 (3); or

*4/ (ii) for the duration of the relevant commitment of the individual farmer, is af**forest**ed pursuant to Article 31 of Council Regulation (EC) No 1257/1999 of 17 May 1999 on support for rural development from the European Agricultural Guidance and Guarantee Fund (EAGGF) (4) or to Article 43 of Regulation (EC) No 1698/2005 or under a national scheme the conditions of which comply with Article 43(1), (2) and (3) of that Regulation; or*

*5/(iii) for the duration of the relevant commitment of the individual farmer, is **set aside** pursuant to Articles 22, 23 and 24 of Regulation (EC) No 1257/1999 or to Article 39 of Regulation (EC) No 1698/2005.*

2.1.4   Art 55

*Except for Bulgaria and Romania, any new Member State having applied the single area payment scheme may provide that, in addition to the eligibility conditions established in Article 34(2), 'eligible hectare' shall mean any **agricultural area** of the holding which has been maintained in good agricultural condition on 30 June 2003, whether or not in production at that date.*

2.1.5   Art 124 (Area under SAPS)

*1/ (ii) For the purposes of this Title, 'utilised agricultural area' shall mean the total area taken up by arable land, permanent grassland, permanent crops and **kitchen gardens** as established by the Commission for its statistical purposes.*

3   **Land Cover and Land Use**

3.1.1   From the previous chapter, we see how the CAP Regulation categorizes land for "eligible hectares". The next step is to translate these concepts into a practical methodology.

3.1.2   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, agriculture 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).

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3.1.3 The CAP regulation uses 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.

3.1.4 For spatial mapping to measure 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.

3.1.5 A land cover classification would thus be the preferred instrument to identify the potential eligibility.

3.1.6 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.

3.1.7 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 possible to directly assess land use aspects by mapping. These may however be studied by collecting and analysing information from relevant attributes within the IACS database.

4 A common classification

4.1.1 The EU Member States are currently using different conceptual frameworks in order to define and map 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.

4.1.2 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

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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.
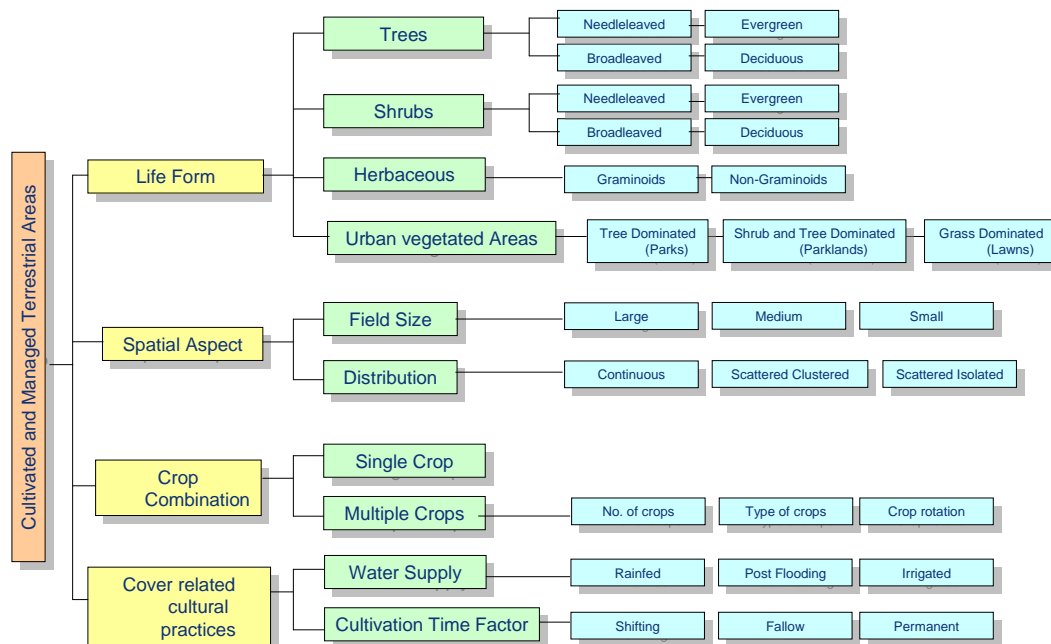
Figure 1: Classifiers within the LCCS "Cultivated and Managed Terrestrial Areas"

4.1.3   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 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.

4.1.4   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)

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4.1.5   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.

4.1.6   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).. An example of a specific land cover class, coded using LCCS is given in Appendix A to Annex III (see http://marswiki.jrc.ec.europa.eu/wikicap/index.php/GAMMA_3.c.iiiii).

4.1.7   All land cover categories, constituting "eligible hectares" in the CAP Regulations (in particular R 73/2009 art 124 for SAPS, and R 1120/2009 art 2 for SPS) can so be expressed in the LCCS language, including the exceptional particular cases, found in some EU Member States.

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

5   Eligible landscape elements

5.1.1   Apart from the main eligible hectares, some ecologically valuable landscape elements can potentially also be eligible. These elements are defined under the framework of Annex III of Council Regulation 2009R73 "Retention of landscape features, including, where appropriate". Their eligibility is subject to explicit GAEC legislation of the individual Member States and their spatial context in which the feature is found.

5.1.2   The possible landscape elements of Annex III (Council Regulation 2009R73) represent land cover features, subject to specific mapping instructions.

- hedges   --> linear
- ponds   --> polygon
- ditches   --> linear
- trees in line,   --> linear

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- trees in group   --> polygon
- isolated tree   --> point
- field margins   --> linear

5.1.3 EU Member State Administrations should provide the list of eligible landscape feature (subject to 2009R1122 art (34)3) and their definition, together with the LCCS description, as a part of the Eligibility Profile (see the Chapter 7). The mapping instructions, portrayal specifications and the rules for the calculation of their eligible area should be recorded in the Implementation Conformance Statement (ICS), as part of the ATS archiving package. Landscape elements subject to 2009R1122 art (34)2, are by default not in the scope of quality measures10104 and 10104_2, and should not be included in the Eligibility profile.

6 Proposed list of agriculture land cover classes and landscape elements

6.1.1 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 regulation. A separate column "**Representation of eligible land**" is introduced, which classifies each land cover type, according to its "ability" to represent the eligible land:

- 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.**

6.1.2 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.

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6.1.3   For the land cover classes eligible under the specific conditions of 2009/73 article 34.3, 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.

7   Eligibility profile

7.1.1   The **maximum eligible area** is the recorded quantity of land for which farmers can, <u>from a land cover perspective</u>, apply for aid under different aid schemes (in this case SAPS and SPS).

7.1.2   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 applied to the measured areas. In other words, it converts the results of the land cover mapping into "eligible hectares or features found".

7.1.3   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 (SPS and SAPS) only.

7.1.4   A template for the eligibility profile (SPS 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 eligible area is calculated for a mapped land cover feature, described by the given land cover (LCCS) class:

- 100%:   the eligible area equals to the geometric area of the digitized (mapped) land cover feature

- A single value between 0% and 100%:   the 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. This pro-rata application should be in accordance with the definitions in R.1120/2009 and R.73/2009 (see point 9 below).

- 0% or 100%:   the 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.

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7.1.5 The **"0% or 100%:"** factor requires a feature by feature assessment during the ETS. The fully eligible or fully ineligible factors can be applied mechanically on all occurrences of the land cover class (LCCSCode).

7.1.6 The eligibility profile should include also the eligible landscape features, but **only those, that are subject to retention (subject to Article 34(3) of CommReg1122/2009).**

7.1.7 In addition, specific land cover classes are introduced, in accordance with the types of areas listed in Article 34 (2b I and 2bii) of COUNCIL REGULATION (EC) No 73/2009:
   a. Two land cover classes for the natural vegetation under RDP – one for terrestrial and one for aquatic – following the definition for natural habitat given in Art1(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.

7.1.8 The eligibility profile <u>does not</u> contain any non-agriculture (non-eligible) land cover classes. The ETS also doesn't require dedicated and individual delineation of the non-agriculture features, as well as 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 features are grouped in 6 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.

8   Application instruction for the LPIS quality inspection

8.1.1 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 ATS).

8.1.2 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 agriculture land cover classes, representing eligible land:

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    a.   provide the description of the specific land cover classes (that is missing in Table 2) and the motivation for their 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).

8.1.3   An eligibility profile involves the following steps:

- Assign to each of the land cover classes defined in the previous step, the relevant principle (formula) for the calculation of the eligible area, according to the national legislation, country-related agriculture practices and supporting schemes applied.

8.1.4   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.

8.1.5   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 regulations (R 1120/2009 and R 73/2009). These are given in the fields of column "**Minimum Mapping Legend",** which are the legend entries that should reflect the eligibility categories 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.

8.1.6   This minimum mapping legend distinguishes the following entries.

- A   arable land
- G   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)

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8.1.7   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 report its user-defined legend entries (for their specific land cover types and their landscape features) in its eligibility profile in the ATS-ICS. They should be expressed with maximum 2 capital letter abbreviation.

8.1.8   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.

9   Pro-rata eligibility

9.1.1   In the ETS, the quantification of the maximum amount of agriculture land, which could be eligible for CAP payments for given reference parcel, is made through a summing up of the polygon areas of land cover features found on the land represented by the reference parcel. However this approach is applicable only when these features represent "pure" agriculture land cover. Often, the land cover feature is an intrinsic mixture of agriculture and non-agriculture components which cannot be delineated and depicted separately. A typical example could be, the low-productive grassland in the semi-mountainous areas, containing clusters and inclusions of trees, bushes or bare rocks. Such type of grassland is not merely a mix of some default and distinct area types, but typically a well described land form/habitat with an intrinsic land cover mix in a particular context. In such case, the problem for quantifying the eligible land for the given land cover feature (and so for a given Reference Parcel), could be resolved by applying a proportional (pro-rata) approach.   The agriculture (respectively eligible) area of a mapped land cover feature, classified as "pro-rata" could be calculated as percentage of its mapped polygon area. The exact percentage depends on the type the mixed land cover, considering the prevalence of the agriculture component(s).

9.1.2   The rationale behind the introduction of the pro-rata is to address the area measurement and area estimation issue for such mixed land cover features and thus removing the "fuzziness" or arbitrary outcome. Whenever an EU Member State decided that a pro-rata approach could be applicable for certain type of land cover, it should:

   a.   Define a specific pro-rata land cover class
   b.   Apply it in a systematic (nationwide) manner
   c.   Exclusively from all "purely" eligible and ineligible areas
   d.   Exhaustively for all areas of that "type" (no choice from the farmer)

   The "pro-rata" class should be:

    a.   Defined and (typically) named

    b.   Easily identifiable and distinguishable

          i.   By its characteristic (physiognomic-structural) components

         ii.   In a specific local context

It should also have well known and stable proportions of the mixture components, which might be often a result of a typical agricultural practice (for example, the pastures with trees (dehesas) in Spain).

9.1.3   The EU MS should present a motivation why the agriculture component of such mixed land cover feature cannot be precisely mapped, for example:

    a.   spatially interwoven mix of land covers within the MMU

    b.   temporal fluctuation of the internal boundaries

The EU MS should also clearly demonstrate how it arrived to the rate applied for the pro-rata class (results from OTSC, analysis of historical images, specific studies, etc..).

9.1.4   In any case, whenever in the ETS operator needs to deal with land cover features subject to "pro-rata", he should always separately delineate any distinct patches of homogenous components larger than 0.1 ha, as well as any non-mixture components (e.g. roads).

10 Individual parcel eligibility reductions

10.1.1 During OTSC driven RP updates, member states may have attributed maximum eligible area values based on field assessment methods which can not be reproduced by the ETS methodology. A scorecard assessment is a wide-spread example of this approach and yields a value that not based on a delineation of terrain features.

10.1.2 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.

11 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.

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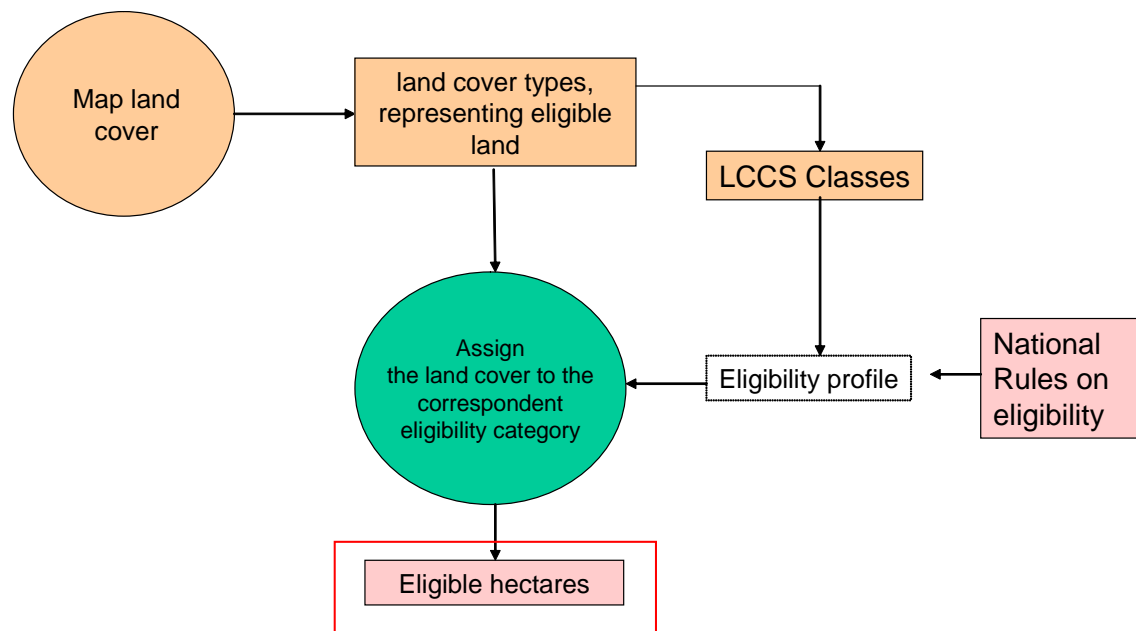
Figure 2: General overview of the ETS analysis and decision workflow

12 References

- Land Cover Classification System (LCCS) 2: http://www.glcn.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 CAP eligible land 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 Trees (up to 15% of the surface)	Herbaceous Crop(s) ., With Fallow System / Sparse Trees And Sparse Herbaceous	10660 / 20505	PRO RATA
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	PRO RATA
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)

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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
Permanent crops (vineyards)	Permanently Cropped Area With Rainfed Broadleaved Deciduous Shrub Crop(s) Dominant Crop: Fruits & Nuts - Grapes (Vitis vinifera)	10566-1891-S0610	YES
Permanent crops (olive trees)	Permanently Cropped Area With Rainfed Broadleaved Evergreen Tree Crop(s) Dominant Crop: Industrial Crops - Olive (Olea europaea 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 (Eucalyptus 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 (Gossypium spp.)	10188-S0903	YES
Rice fields	Graminoid Crops On Permanently Flooded Land; Dominant Crop: Cereals - Rice (Oryza spp.)	30001-S0308	YES
Starch Potatoe	Permanently Cropped Area Non-Graminoid Crop(s); Dominant Crop: Roots and Tubers - Potato (Solanum tuberosum 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

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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 34 (2i and 2iii) of 73/2009	Closed to Open Woody Vegetation With Herbaceous Vegetation On Waterlogged Soil	41632(3)[Z20]	CONDITIONAL
Afforested former agriculture land - implementation of Art 34 (2ii) of 73/2009	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 Regulations R 1120/2009 and R 73/2009.
- 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	A	10660	YES	100%
Arable Land (temporary resting)	Shifting Cultivation Of Herbaceous Crop(s)	Arable land	A	10224	YES	100%
Arable Land with Patches of Trees (up to 15% of the surface)	Herbaceous Crop(s) ., With Fallow System / Sparse Trees And Sparse Herbaceous	n/a	tbd	10660 / 20505	PRO RATA	Single value between 0% and 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	A	10660 / 20505-9032	PRO RATA	Single value between 0% and 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 pasture (self-seed or sown)	**Closed Medium To Tall Grassland, Single Layer Floristic Aspect: Groups of Plant Species // Permanently Cropped Area With Graminoids Crop(s) Dominant Crop: Fodder - Fodder**	**Grassland**	**G**	**20439-12763-T2 // 11512-S0701**	**YES**	**100%**

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	grasses					
Permanent pasture (self-seed)	**Closed Medium To Tall Grassland, Single Layer Floristic Aspect: Groups of Plant Species**	**Natural Grassland**	**N**	**20439-12763-T2**	**YES**	**100%**
Permanent pasture (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	T	10153-S6W8	YES	100%
Permanent crops (plantation)	Permanently Cropped Area With Rainfed Tree Crop(s); Crop Cover: Plantation(s)	Permanent Tree crop	T	10153-W7	YES	100%
Permanent crops (olive trees)	Permanently Cropped Area With Rainfed Broadleaved Evergreen Tree Crop(s) Dominant Crop: Industrial Crops - Olive (Olea europaea L.)	Permanent Tree crop	T	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	S	10188(2)[Z12]	YES	100%

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Permanent crops (vineyards)	Permanently Cropped Area With Rainfed Broadleaved Deciduous Shrub Crop(s) Dominant Crop: Fruits & Nuts - Grapes (Vitis vinifera)	Permanent Shrub crop	S	10566-1891-S0610	YES	100%
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	S	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	A	11002-S0402	YES	100%
Sugar beet	Permanently Cropped Area Non-Graminoid Crop(s); Dominant Crop: Roots and Tubers - Beetroot (Sugar beet)	Arable land	A	11002-S0499Zs1	YES (SAPS only)	100%
Pulses and Vegetables	Irrigated Non-Graminoid Crop(s) ; Crop Type: Pulses and Vegetables	Arable land	A	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 34 (2i and 2iii) of 73/2009	Closed to Open Woody Vegetation With Herbaceous Vegetation On Waterlogged Soil	Waterlogged natural vegetation under RDP	XB	41632(3)[Z20]	CONDITIONAL	0% or 100%

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Afforested former agriculture land - implementation of Art 34 (2ii) of 73/2009	Open Medium High Trees (Woodland)	Afforested areas under RDP	YA	13233(3)[Z21]	CONDITIONAL	0% or 100%
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 50 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 ATS-ICS.
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 in R.1120/2009 and R.73/2009.

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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