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*Land tenure and
"at the disposal of"*

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Abstract

This material is an introduction and the discussion document about the legal and spatial context of defining agricultural parcels of the Land parcel information system. So far, some EU Member States' Administrations use legal documents in evidencing the land that is at the farmers' disposal to be entitled for payment support. None of the acts from EU regulation provides specific provisions how authorities should verify that the farmer holds access and use rights for agricultural parcels he declares. Once legal documents became necessary to evidence the use of land, many issues arise and prevent a farmer to declare actual utilization of agricultural land. MS Authorities put more obligations to the farmer than necessary. Those legal and spatial records are very often not up-to-date and full of inaccuracies, hence should be considered with attention. We provide insights of those discrepancies and provide recommendations to the Member States' Administrations.

1 Introduction

This document was created as a follow up action after the working group "Land Tenure and at the disposal of" discussion in IACS workshop that took place in Vilnius 2018. One of the points discussed among the participants was a proposal to the JRC to produce a set of best practices for the Member States to administrate and control the farmers' land disposal. This topic of land tenure popped up as important during the discussions in the IACS workshop as JRC identified many functional issues with the LPIS design during the screening of the LPIS QA reports.

The latest Common Agricultural Policy reform puts the reduction of the administrative burden as one of the core priorities. In that respect, land management plays a big role in designing and keeping the LPIS manageable.

Regulation (EU) No 1307/2013 provides a framework of the CAP in establishing rules for direct payments to farmers under support schemes. For the purpose of the activation of payment entitlements, the farmer shall declare the parcels corresponding to the eligible hectares accompanying any payment entitlement. The parcels declared shall be at the farmer's disposal on a date fixed by the Member State (Art. 33).

Regulation (EU) No 1306/2013 on the financing, management and monitoring of the CAP further provides requirements that each year, a beneficiary shall submit an application for direct payments or a payment claim for the relevant area and animal-related rural development measures respectively indicating (1) all agricultural parcels on the holding, as well as the non-agricultural area for which support is referred to, and (2) the payment entitlements declared for activation. In all cases, the farmer shall indicate in his application that he has agricultural parcels at his disposal and at the request of the competent authorities, shall indicate their location (Art.72).

Neither basic nor delegated acts provide any specific provisions on how authorities should verify that the farmer holds access and use rights for agricultural parcels he declares. Practices are different across the EU, but they all somehow relate to the formal land tenure and land management registries and procedures in each Member State. For some this relationship prevents the processing of the true (i.e. physical real world) utilized agricultural area size and for others often creates unnecessary administrative burden.

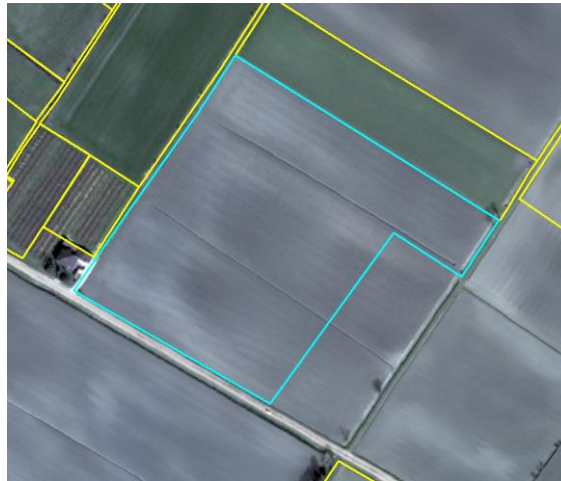
2 Specific topics

2.1 Legal aspect of the use of land

Some Member States are using legal information from other sources to verify the disposal of the land to the farmer. It comes from the national legal legislation. Whilst the Land registry and Cadaster are main legal registries in the Member States where legal rights on land use are registered, in many cases their representation on a map does not geographically correspond with the true situation on the ground. Hereby we mean that the location and/or size of the parcels may be imprecise and/or obsolete.

On the other hand, the annual aid application requires latest and updated information on the true parcel sizes and their location, hence the incentive of the LPIS registry has an update frequency requirement which is much higher for the national Land registries where formal transactions and hence updates are less frequent (see figure 1).

Figure 1. Reference parcel boundary (cyan polygon) based on cadaster parcel (ownership right) is smaller than actually used agricultural parcel visible on satellite imagery



Source: JRC, 2018.

Consequences of registering land in the LPIS without the legal documents of the ownership or lease contracts could be risky both for the farmer and for the Authority. While the EU regulation does not require such documents, as long as the amount of support goes to the farmer that is actually performing agricultural activity on the land, the area specified in ownership/lease proof is not critical. On the contrary, some land registry documents and area values are not meeting the 1:5000 scale requirement of the regulation and should be discarded.

By requiring legal documents on land use, some LPIS Authorities like to minimize the risk of claim on "any" land, while the farmer minimizes the risk of aid suspension. Where applied, it often leads to much smaller area declaration than a factual utilization of the land or vice versa. It violates the basic requirement of having a measurable, stable and functional unit as reference parcel. Such parcel design (parcel boundaries) would in LPIS QA assessment lead to high numbers of critical defects (dysfunctional reference parcel) leading to non-conformity verdicts. As LPIS reference parcel should be measurable and have a stable reference area for any agricultural activity, the visible agricultural area is a much better instrument to support the farmer for claiming and receiving payment on the total area of the production unit.

2.2 Lease contract and ownership shareholders

A second issue with tracing back the lease contract of the land to an ownership right could appear for the cases where legal ownership was not updated over the years. In some cases the owners are deceased or immigrated to distant countries, and relatives were left to use the land but without a formal or legal mandate to manage this land. In addition, a variant of this could occur in the parcels with many co-owners but where some co-owners are not available. Consequently, can remaining shareholders give a full lease contract to a third party over the whole parcel or only to a part corresponding their share?

Some Member State's Authorities follow ownership share rights on a single agricultural parcel by allowing shareholders as individual farmers to declare shares on that particular agricultural parcel. While in practice only one shareholder is actually performing agricultural activities on that parcel, authorities are assuring that the support is payed to all shareholders (often family members) provided that one shareholder evidences the agreement allowing him to farm on behalf of all. While such issue isn't reflected in the quality requirements of the LPIS QA framework, it could become an issue with on the spot control – OTSC. The GSAA could indicate smaller units and virtual divisions of an agricultural parcel in a bigger RP block (as visible on the ground), each belonging to a single "farmer", whereby an inspector would not be able to measure such virtual and non-physical boundaries of the declared area. Fundamentally, CAP supports farmers' activity and not the ownership rights, hence further dispersion of the received money/aid within the family members or other transactions like rental payment to the owner should be handled outside formal CAP procedures. In any case, it is of big importance to establish a clear relationship between farming activities and the payment so that authorities are able to identify and cross check both conformance for the payment and possible non-compliance for the penalty and to direct them toward the true performer.

2.3 European Court of Justice Judgement

In the context of land tenure and the disposal of the land, it is important to mention two European Court of Justice judgements: case-law C-61/09⁽¹⁾ (Landkreis Bad Dürkheim) and Pontini case C-61/09. Although those cases were not explicitly about the subject of this document, they tackled some valuable conclusions related to the subject.

In Case C-61/09 "Landkreis Bad Dürkheim" the Court concluded that the EU legislation on direct payments does not specify the nature of the legal relationship on the basis of which the area concerned is used by the farmer. It cannot be inferred from those provisions that the parcels in question must be at the farmer's disposal pursuant to a lease or other similar transaction. The ECJ's judgment stressed that the admissible contractual relationship cannot be limited to a "lease or similar transaction" because under the principle of freedom of contract, the parties are free to arrange the legal relationship on which use of the area in question is based.

In the Pontini case (C-375/08), the Court explained that "subject to compliance with the objectives pursued by the Community legislation, as well as the general principles of Community law and, in particular, the principle of proportionality, the Community legislation does not preclude Member States from imposing, under their national legislation, a requirement to produce such a document" (a valid legal document attesting to the aid applicant's right to use the areas to which the application relates). In light of this, it could be concluded that the Member States can require some legal relationship between the owner of the land and the applicant for direct payments, and then this is perfectly valid. What Member States cannot do, however, is to insist on a very specific legal relationship.

⁽¹⁾ <https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:62009CJ0061&from=EN>

This judgement, however, does not go deep into the technical details and issues that take part of our concern. It does not tackle any positional mismatches or other spatial components of the land in subject elaborated in chapter 2.5.

2.4 European Court of Auditors recommendation

In the special report⁽²⁾ on the LPIS issued by the European Court of Auditors, one of the recommendations was on a good practice with regard to verification of evidence of the right to use the land (page 24). The ECoA consider it good practice to complement the LPIS, whenever feasible and cost-effective, with information on whether the declared parcels are at the farmer's disposal, which would enable Member States to cross-check such information against aid applications.

2.5 Spatial aspect of the legal documents

As mentioned earlier in the document, documents certifying a legality of someone's ownership are mostly dealing with the right of use, tenure, titles, deeds, mortgages, responsibilities and other states of legal powers over a certain unit of land. In these legal documents, units in subject are identified with a designated identification code nomenclature unique for any unit/parcel/plot. However, technical data of that unit, like the area and the position may not be so precise.

Although cadaster should reflect geometric description of the land parcels, there might be shifts in true position of particular parcel and the cadaster map. The reasons are many, mainly coming from old and outdated technologies implemented many decades ago without a comprehensive updates (land survey done in Napoleon time or Maria Theresa time). The incentive of updating and correcting displacements and true area has always been bigger in the urban areas, and less in rural parts or in the mountains. With the technology development, today we have been able to measure the area of any space, and place it according to an agreed coordinate reference system, so that the repetition of the same measurement would result with the same value of that measurement (within a certain technical tolerances).

So where is the problem? Measurements of an area done with the old technologies established the initial historic area values that entered into the legal documents. People associated their piece of land with that initial area value. Moreover, with new and more precise measurements, people could have "loose" some square meters, hence loose value of their owned land. This idea was hardly accepted by all stakeholders. In many EU countries, land reforms brought more precise location of the land units, but without adjusting the area component. Instead, the historic area values were rather inherited than confronted to make agreements between the people for an updated area values that would be time-consuming and cost-ineffective process. The result was a corrected cadaster map, and historic area values; an official area value that did not reflected the true geometric area from corresponding polygon of the land in subject. The parcel coordinates therefore may not be used for the exact calculation of parcel areas and dimensions. The differences in official area and the true one of a particular parcel could in some places go up to 20% (see Figure 2.).

Second issue lies in the land change phenomenon that has not been timely updated neither in the Cadaster map nor in the Land registry. With the use of land, especially for the agricultural purpose, limits of the land use may change over time. Farmers are changing their crop patterns for many economic and other farming reasons. Parcels have changed in size and shape (see Figure 1.) without any disputes between landowners whereby the change was not followed up by an update in legal documentation.

Within CAP requirements, issues highlighted above are not acceptable. CAP payment schemes, which are area based, require a LPIS system with true area of recorded and

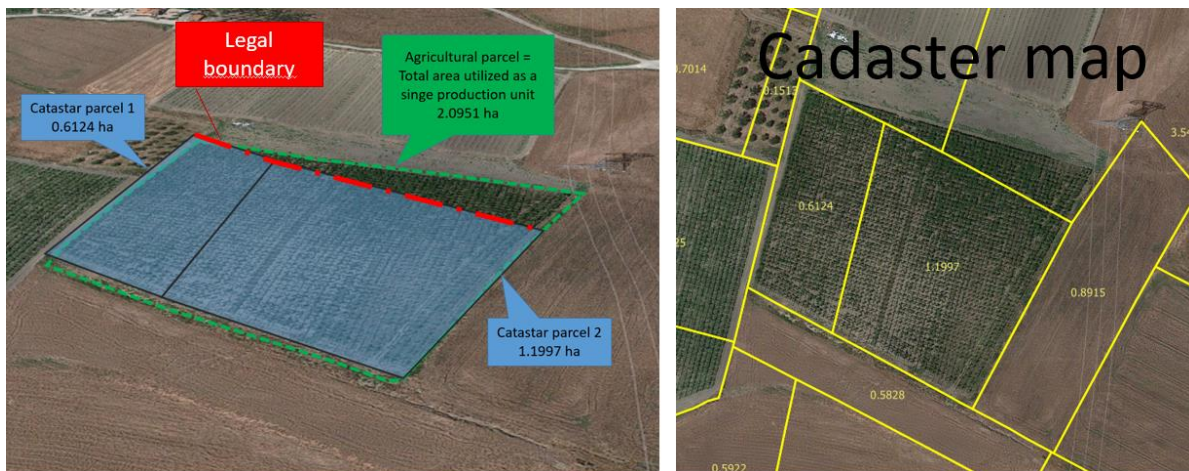
⁽²⁾ https://www.eca.europa.eu/Lists/News/NEWS1610_25/SR_LPIS_EN.pdf

declared parcels, and it requires to be created in a homogeneous standard of at least 1:5000.

In all areas within Member States where cadaster maps are officially known to have less precise⁽³⁾ spatial component, such information do not comply with the basic legal CAP requirement.

A hypothetical example from Figure 2. below shows an agricultural parcel with a clear homogeneous and permanent crop cover most probably managed by one farmer. Surface of that agricultural parcel is spread over more cadaster parcels as visible on the cadaster map. Only two cadaster parcels are formally legal units belonging to that farmer. Should we blindly accept only officially known area of those two cadaster parcels, the farmer would be supported for only 84,38% of the real area at his disposal, whereby the rest of the area would be payed to the neighboring farmer if he would apply for subsidies. In the context of CAP, such situation is unacceptable.

Figure 2. There is an area difference of 0,2830 ha of the true agricultural area at farmers disposal and legally known area registered as his ownership right. It makes a relative difference of 15,62%.



Source: JRC, 2018.

On the other hand, a cadaster map could be very precise if updated recently, and in the places where there is hardly any change on the land use. Albeit, in many European Member States Cadaster Systems tends to develop a multi-purpose usage, there are still many institutional, legal, technical and administrative constraints to resolve. A Member State should carefully evaluate all this aspects in order to conclude how to use the spatial information from a cadaster map to facilitate evaluation of farmers land disposal.

2.6 Commonages

Some parts of Europe traditionally keep common land under shared responsibility regarding its use. It is a typical form in Ireland and the United Kingdom – so-called commonages, but similarities could be found with the state owned blocks of land and further let to farmer’s associations in other European countries.

By definition, commonage is land that is used by more than one person. Typically, each shareholder owns a defined fraction of the total area and this is detailed on each shareholders folios. It is not the same as having co-owners over a single parcel. Commonage situation arises in respect of lands where there are “grazing rights” and goes back in history. People with livestock used to either use nearby unenclosed land or rent it from the landlords. After the reform, the use of unenclosed land had to be formalized. Hence, there a registration procedure took place of allocation of the shares to the former

⁽³⁾ Cadastral maps commonly range from scales of 1:500 to 1:10,000

tenants. Grazing rights on commonage do not include any financial transactions between the user and the formal owner. Today, the formal owner of the commonage could be various institutions, charities, corporations and trusts as well as private individuals.

Charts or index maps of commonages originating from a Torrens Systems (in Ireland and the United Kingdom) are typically of a low integrity, often not related to national coordinate system. If mapped, they do not relate to topographic map, but to an isolated cadastral survey. While a common parcel boundaries could more or less be determined, the grazing right of an individual farmer inside of commonage, however, is not spatially determined nor fenced. Basically it is a proportionate to the share of the land owned and strict physical boundaries are of less importance. Grazing right relate to the movement of animals, where they can walk, graze and lay down whereby nobody disputes area overlaps. Hence, quantification of the right is based on fixed number of animals and not on the exact location.

Those lands are valuable cultural, ecological landscape type in themselves and a valuable agricultural. In many cases, they also have recreational use for the public. Still, they are subject of direct payments, and as such need to comply with the CAP requirements. Up to date such parcels have been treated as a single reference parcels within the LPIS, and declaration of the shares for the BPS have been submitted as numerical values without any physical check of the true utilized areas as for other non-common parcels. Authorities should expect from the farmers to keep the minimum agricultural activities not only in grazing but also in reseeding, taking fern control measures, etc. of those grasslands. To minimize overgrazing, authorities rather restrict the number of animals grazing the commons.

Taking into account specificity of those lands, and the fact that the focus of individual farmers on the area of interest to them can hardly be accommodated within a management plan for the entire common parcel, there should be a different action plan put in place. Unless farmers do not agree to physically mark their shares in the field, there is very low possibility to obtain realistic and true information of their agricultural activities, as well as to perform area based monitoring.

Unlike in the Ireland and the UK, other EU Member States have mapped out measured complete national territories; therefore, parcels commonly used by many farmers have determined boundaries and reference to the national coordinate system. They can unambiguously be located and its area quantified. Usually they are grassland parcels, state owned and leased-in to individual farmers or farmers associations. However, similarly to commonages, the shares inside the common parcel are proportionally distributed based on the number of life stock whereby the physical area of the share is undetermined.

3 Practices in EU Member States

Belgium, the Netherlands, Denmark, Germany

Farmers are registering their agricultural land within the holding without any additional legal documents. Since agricultural land is more or less fully utilized over the whole state territory, only in very rare occasions doubtful declaration on somebody else's land may occur. Such disputes surface through double declarations, owners informing us that there land is not in agricultural use or owners/somebody else walking up to talk to our inspectors during field visits. Depending on the way they are discovered, these disputes are dealt with by:

- Informing both farmers in writing of the double declaration and asking them to resolve the matter. If they resolve the matter between them, no further legal documentation is required. If they do not, we will review the written documentation they provide to decide which farmer (if any) is entitled to use and register the land.
- Informing the farmer who declared the land that his declaration is not accepted (sanctions will be applied). If he wants to appeal this decision, he must supply written documentation to prove he is entitled to use and register the land.

Croatia, Slovenia

The initial registration of the holding can be done if a person holds agricultural land or live stoke resources. In case of land resources, all available agricultural land should be recorded in the LPIS beforehand by providing legal documents of ownership or right to use (lease contract or similar) or geotagged pictures in the premises of a Regional Office (in Croatia), or by providing the legal documents upon a specific request (in Slovenia). Paying Agency officials are drawing new agricultural parcels in the LPIS based on the most recent imagery. Location of the parcels have been indicated on the map by the farmer during the process of the initial AP boundary delineation, and crosschecked with boundaries of the cadaster maps. The new agricultural parcel does not need to spatially match the cadaster parcel boundary, but it should be "close" to situation represented in the cadaster spatial registry. Hence, the cadaster map serves only to locate farmers' land without imposing matches to the so-called property boundaries.

In case of land disputes, two or more farmers are asked to come to a meeting to argue the true land use and provide legal documentation.

Bulgaria

Figure 3. Cadaster parcels (dashed blue polygons) based on virtual division not following physical reality as visible on imagery



Source: Bulgarian Paying Agency, 2018.

In 2015, Bulgaria introduced "at the disposal of" layer within the LPIS. This was a decision done due to many existing double declarations. The new "at the disposal of" layer was in fact the existing map of legal rights that was in many cases not following true physical crop limits. In the same time, it should be noted that this newly digitized cadaster (legal rights) map was partly created on a virtual divisions of the land instead of the real land use as present in the field (see Figure 3.)

The solution positively resolved the double declarations, but negatively affected the concept of the agricultural parcels. Introduction of the "at the disposal of" layer led to appearance of virtual declarations of the property parcels rather than the real agricultural parcels.

4 Conclusions

In a very recent communication, EC services provided an explanation on the very basic question whether a Member State should impose the need of proving the legal base of the use of land. The reply was backed up by the two court cases mentioned in the chapter 2.3.

"Direct payments to farmers" are paid on the basis of hectares "declared" by a farmer; the EU legislation provides that these should be at the disposal of the farmer at a date to be fixed by the Member States. The EU legislation does not specify the nature of the legal relationship that allows the farmer to use the area. There is no obligation that the land is declared (or at the disposal) by the farmer pursuant to ownership, lease or other similar transaction; this is the case because under the principle of freedom to contract, the parties are free to arrange the legal relationship. In principle Member States cannot reject an application for aid directly on the basis of its national law/practice requiring evidence of a particular legal relationship with land. However, it is possible for Member States to take certain proportionate measures, in particular in specific cases where they have doubts and strongly question the good faith of the beneficiaries' possession.

It would therefore be excessive for a Member State to reject an application for aid directly (without examining all the elements of the application) on the basis of its national law/practice requiring evidence of lawful disposal of land, as a pre-condition for entitlement to the aid regime. However, it is possible for Member States to take certain proportionate measures, in particular in specific cases where they have doubts and strongly question the good faith of the beneficiaries' possession. Refusal to pay agricultural aid if the legal title does not conform to certain formal/procedural conditions is a borderline area and would probably depend on whether one party questions the validity of the legal title on the grounds of non-compliance with the formal conditions. A case-by-case approach should be taken."

It is important to point out that EU legislation does stipulate that on a fixed date (determined by the Member State) a farmer should provide legal documentation on the land at his disposal. This provision is designed to avoid conflicts in double declarations in a single claim year. In practice, this means that the aid would go to the farmer who is able to provide legal information of the land he declared in his annual aid application, and this legal information was valid on that fixed date. In case he sells or further lease a particular land to someone else after this fixed date, and the "new" owner/farmer declares the same land for aid, the new user/farmer would not have the right to get the support for that land.

Further technical observations and recommendations for Member States are:

- Practice has shown that the spatial component of the Land registries/Cadaster are often not fit for defining the true agricultural parcel boundaries. Since it only partially matches real parcel boundaries, within the LPIS it could be used only for an approximate location of the agricultural parcels, hence providing information of the farmers' land disposal.
- It is obvious that valid legal ownership information and other non-spatial data from the Land registries/Cadaster should be used upon request in disputes or complaints to resolve double declarations. However, such evidence should not prejudice the factual reality in the field and duly consider the technical specifications of its mapping component.
- To avoid declarations of "any" land, where appropriate a risk analysis could be organized for late submissions of the aid applications, holdings with scattered and distant parcels, holdings with sudden increase of the total area, and/or other unusual occurring patterns.
- It would be of a good practice that Member State sets up an alphanumeric relationship between the identification system for agricultural parcels (LPIS) and

system for identification of beneficiaries (farmer register) and store available disposal rights (agreements, lease-in contracts) taking into account the temporal validity of those.

References

EC regulation No 1306/2013

EC regulation No 1307/2013

EC regulation No 1782/2003

ECoJ case-law C-61/09, ECoJ2005

ECoA special report on LPIS, ECA 2016

TG ETS v6.3, JRC 2018.

TG MLL, JRC 2015.

ISO TC 211 \ ISO 19152, Annex H

<http://www.eurocadastre.org/pdf/delinco.pdf>

<https://marswiki.jrc.ec.europa.eu/wikicap/images/1/18/Scheckenbach.pdf>

<https://marswiki.jrc.ec.europa.eu/wikicap/images/e/e1/Tisu.pdf>

<https://marswiki.jrc.ec.europa.eu/wikicap/images/7/75/Luketic.pdf>

<https://marswiki.jrc.ec.europa.eu/wikicap/images/a/a1/Pramatarov.pdf>

<https://marswiki.jrc.ec.europa.eu/wikicap/images/e/e6/Slaviero.pdf>

https://marswiki.jrc.ec.europa.eu/wikicap/images/1/1d/WG_landTenure.pdf

<http://michaelmartyn.ie/wp-content/uploads/2014/10/Report-on-Commonage-Case-Studies.pdf>

Commons Toolkit, Fact sheets, Foundation for Common Land, 2015.

List of abbreviations and definitions

CAP	Common Agricultural Policy
ECJ	European Court of Justice
ECoA	European Court of Auditors
EC	European Commission
EU	European Union
GSAA	Geospatial Aid Application
IACS	Integrated Administration and Control System
JRC	Joint Research Centre
LPIS	Land Parcel Information System
LPISQA	Land Parcel Information System Quality Assurance
OTSC	On the spot control
RP	Reference parcel

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