



Cadastre and Land Registry  
Knowledge Exchange Network

# Economic Impact of Cadastre

Results of questionnaire carried out in preparation for the «PCC Conference jointly organized with support from CLRKEN of EuroGeographics» on 6-7 June 2019 in Bucharest

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## Economic Impact of Cadastre

In preparation for the PCC Conference jointly organized with CLRKEN of EuroGeographics in June 2019, a questionnaire with approx. 20 questions was conducted among the member countries of both organizations. The focus of the conference was the economic impact of the cadastre, a topic of high relevance in many countries. The aim of the questionnaire was to get an overview of the economic status of the cadastre in the member countries.

### Economic Impact of Cadastre

Most cadastral systems traditionally document private-law land ownership rights in order to sustain a transparent and fair land market. As De Soto (2000)<sup>1</sup> put forward, the formal recognition and registration of landownership potentially increases the value of the properties themselves. Therefore, an effective land administration system is a crucial element for the economic development of a country.

### Participation

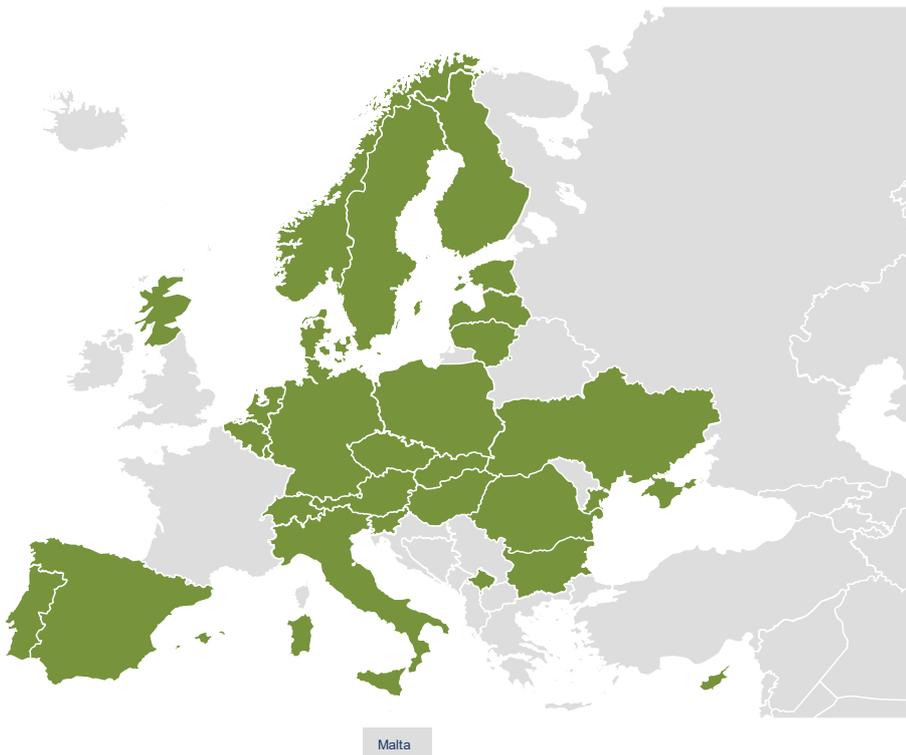


Figure 1: 27 participating countries.

<sup>1</sup> De Soto (2000). "The Mystery of Capital: Why Capitalism Triumphs in the West and Fails Everywhere Else".

## Characteristics of the Cadastral Systems

Country	Q2) Deeds or title registration	Q3) Registration of landownership	Q4) C and LR integrated or separate	Q5) Personnel active in cadastre: public / private sector	Q6) Personnel active in land registration: public / private sector
Austria	title registration	compulsory	separate	40% / 60%	30% / 70%
Belgium	deeds registr.	compulsory	integrated	100% / 0%	40% / 60%
Bulgaria	deeds registr.	compulsory	separate	15% / 85%	n/a
Cyprus	title registration	compulsory	integrated	94% / 6%	100% / 0%
Czech Republic	title registration	compulsory	integrated	100% / 0%	100% / 0%
Denmark	deeds registr.	optional	separate	5% / 95%	100% / 0%
Estonia	title registration	compulsory	separate	33% / 67%	n/a
Finland	title registration	compulsory	integrated	100% / 6%	100% / 0%
Germany	title registration	compulsory	separate	100% / 0%	100% / 0%
Hungary	title registration	compulsory	integrated	n/a	n/a
Italy	deeds registr.	compulsory	integrated	100% / 0%	100% / 0%
Kosovo	title registration	compulsory	integrated	70% / 30%	100% / 0%
Latvia	title registration	compulsory	separate	71% / 29%	100% / 0%
Lithuania	title registration	optional	integrated	14% / 86%	100% / 0%
Luxembourg	deeds registr.	compulsory	separate	100% / 0%	100% / 0%
Netherlands	deeds registr.	compulsory	integrated	100% / 0%	100% / 0%
Norway	title registration	optional	other	100% / 0%	70% / 30%
Poland	title registration	compulsory	separate	100% / 0%	100% / 0%
Portugal	other	compulsory	separate	100% / 0%	100% / 0%
Romania	title registration	compulsory	integrated	20% / 80%	35% / 65%
Scotland	title registration	optional	integrated	100% / 0%	100% / 0%
Slovakia	title registration	compulsory	integrated	100% / 0%	100% / 0%
Slovenia	deeds registr.	compulsory	separate	40% / 60%	n/a
Spain	title registration	optional	separate	90% / 10%	n/a
Sweden	title registration	compulsory	integrated	100% / 0%	100% / 0%
Switzerland	title registration	compulsory	separate	13% / 87%	100% / 0%
Ukraine	title registration	optional	separate	100% / 0%	100% / 0%

### General Remarks

Italy For many of the following answers, the data related to the Autonomous Provinces of Trento and Bolzano are not included because they manage their cadastral data autonomously.

The following answers are given taking into account that the cadastral data concerning the ownership generally derives from the Land Registry that is based on deeds registration in most of the Italian territory (except for the Autonomous Province of Trento and Bolzano – and other small areas of the Italian territory located in the north-east of the Country – in which the title registration system is in force).

### Remarks to Q2

Portugal There is not yet a Cadastral System in Portugal. There are different databases (DB) for financial issues, title registration and another for geometry parcels (one DB for each Council).

**Remarks to Q3**

- Italy In most part of the Italian territory in which the deed registration system is in force, the registration of the deed concerning the transfer of the ownership is mandatory in order to make it enforceable to third parties.
- Lithuania The registration of land ownership is not compulsory by law, nevertheless the Civil Code of the Republic of Lithuania states that “the parties to an unregistered transaction may not invoke the fact of transaction against third persons and argue their rights against third persons by relying on other means of proof”.
- Portugal Registration of land ownership is compulsory since 2008.

**Remarks to Q4**

- Norway The State represented by the central cadastral authority shall organise, operate and administer the cadastral system and is responsible for the land registry. The municipality is the local cadastral authority, and is responsible for carrying out cadastral surveying and cadastral recordkeeping in the municipality.

**Remarks to Q5**

- Italy The Cadastral System is managed by a public body. Private chartered surveyors are involved for the drawing up and the submission of the cadastral technical updating documents to the public body responsible for the cadastral system management.

**Remarks to Q6**

- Italy The Land Registry is managed by a public body. Notaries (and other Subjects) are involved for the drawing up of the deeds concerning the transfer of the ownership and their submission to the public body responsible for the Land Registry management.

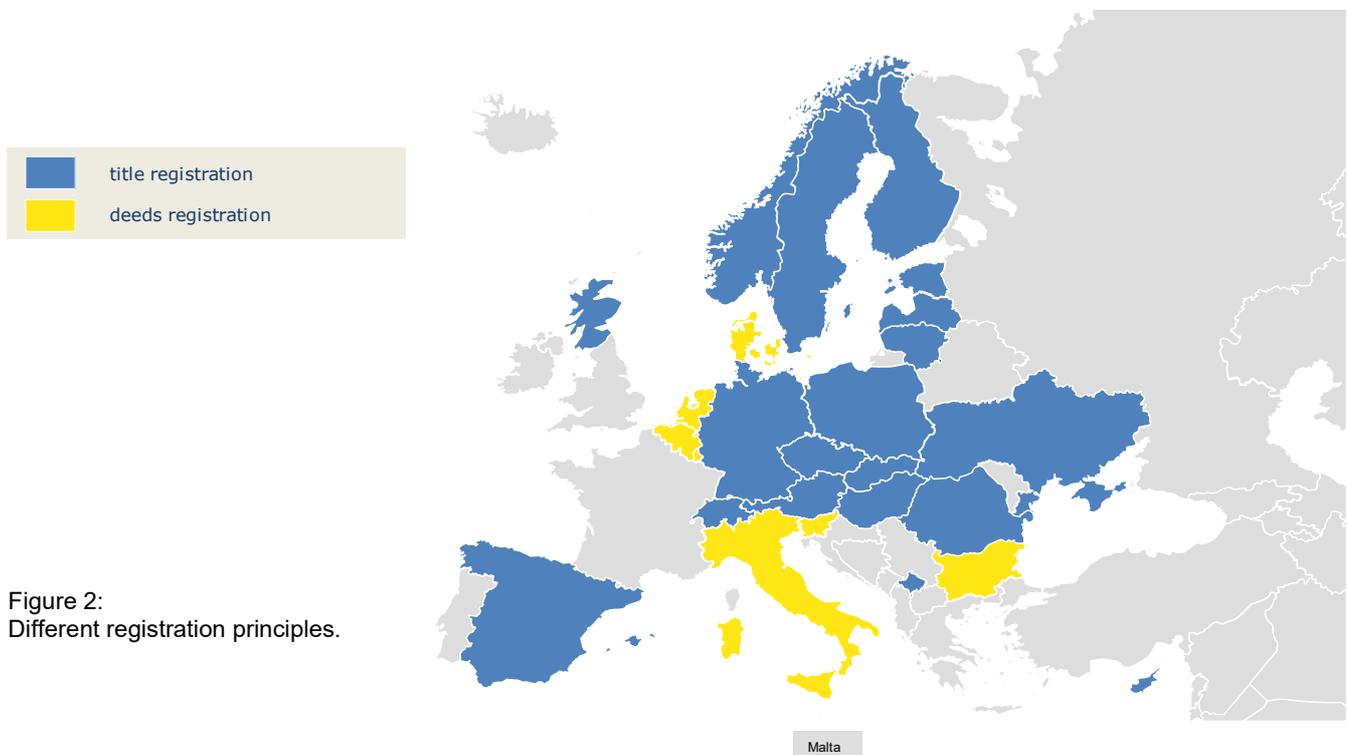


Figure 2:  
Different registration principles.

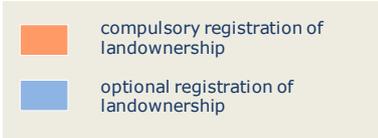


Figure 3: Compulsory vs. optional registration of landownership.

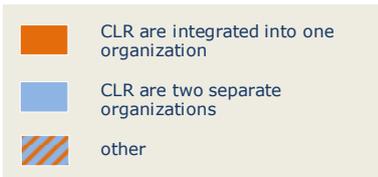
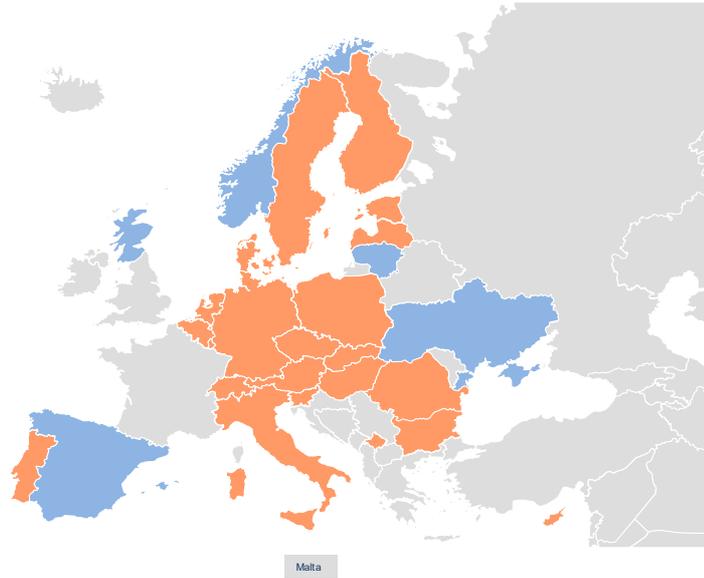


Figure 4: Integrated vs. separate organizations for Cadastre and Land Registration.

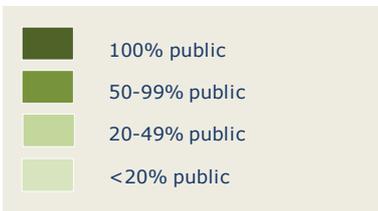
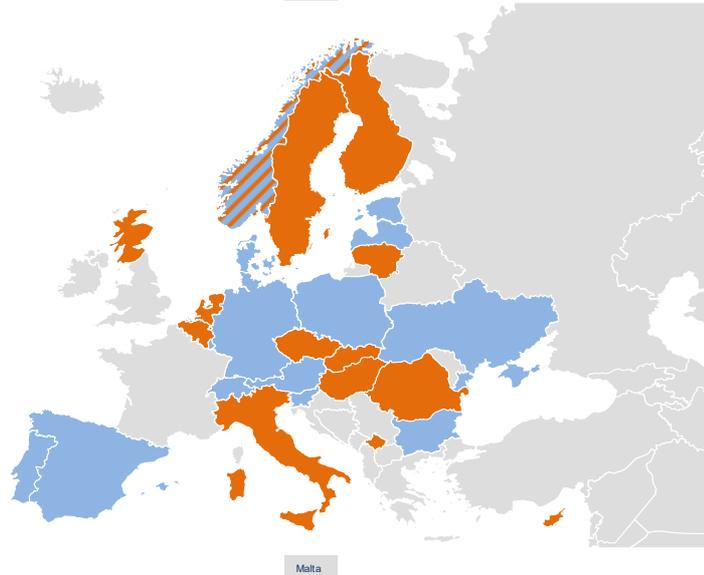
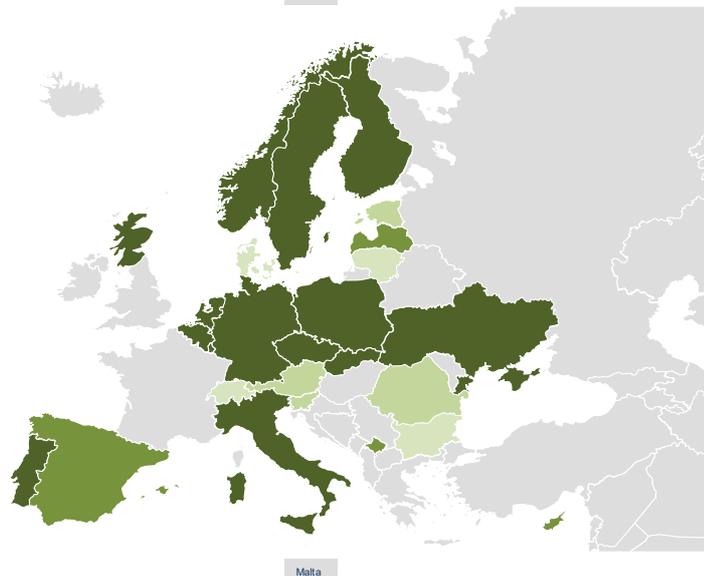


Figure 5: Public-private partnership in cadastre.



## Size and Level of Activities

Country	Q8) Total number of cadastral units	Number of cadastral units surveyed and integrated in system	Q9) Total number of properties	Number of properties registered	Q10) Total number of property mutations	Total number of property transfers
Austria	10,000,000	100%	3 million	100%	~90,000	~200,000
Belgium	8,817,000 (2019)	100%	10,832,806 (2019)	100%	164,000 (2018)	305,774 (2018)
Bulgaria	20,000,000	80%	20,000,000	n/a	49,000 (2018)	600,000 (2018)
Cyprus	1,592,231	100%	161,175	100%	n/a	5,346 (2018)
Czech Rep.	23,000,000	100%	29,000,000	100%	136,886	452,199
Denmark	n/a		n/a	98%	n/a	n/a
Estonia	707,783 (2019)	100%	1,101,025	100%	26,955 (2018)	59,300 (2018)
Finland	2,800,000	100%	2,800,000	100%	20,000	63,000
Germany	64,188,879 (2017)	100%	n/a	100%	118,075 (2017)	n/a
Hungary	8,000,000	100%	10,400,000	100%	500,000	2,500,000
Italy	85,500,000	100%	148,800,000	100%	1,870,000 (2017)	2,300,000 (2017)
Kosovo	2,125,000	75%	2,125,000	100%	40,000	35,000
Latvia	1,019,653	100%	1,430,123	93%	10,844	53,897
Lithuania	6,690,000	100%	6,690,000	100%	161,376	n/a
Luxembourg	695,000	100%	695,000	100%	8,000	23,500
Netherlands	9,000,000	100%	---	---	489,100 (2018)	---
Norway	3,914,753		3,290,594	97%	121,657 (2018)	190,800 (2018)
Poland			15,500,000	100%	400,000	5,193,000
Portugal	2,000,000	0	n/a	n/a	n/a	n/a
Romania	40,000,000	15%	40,000,000	34%	124,518 (2018)	563,501 (2018)
Scotland	1,813,530	100%	2,712,345 (2016)	57%	19,558	129,229
Slovakia	7,967,216	100%	4,578,613	100%	427,730	345,675
Slovenia	6,401,195	100%	5,600,000	100%	63,000	---
Spain	78,206,887	100%	n/a	n/a	1,495,339	2,528,706
Sweden	n/a	n/a	3,531,344	100%	14,727 (2018)	949,556 (2018)
Switzerland	4,013,201 (2017)	97%	4,013,201 (2017)	100%	14'803 (2017)	n/a
Ukraine	n/a	20 million	n/a		200,000 (2018)	n/a

### Remarks to Q8

**Austria** Number of surveyed cadastral units: complete, in three quality levels.

**Italy** Considering that no specific definition of "cadastral units" is given, the following answers refer both to land parcels (85.5 million) and real estate urban units (buildings or parts of buildings, 73.5 million) that represent different cadastral objects registered in cadastre.

**Netherlands** No. of properties: 9 million (including (cable and pipeline) networks and condominium rights) residential property units: 7.814.497 (2018 Q4), other built property units: 1.136.964 (2018 Q4)

All parcels and condominium rights are registered, for networks only those that have been registered the last 10 years (either because of a transaction or because of mortgaging the object).

- Norway** The number of cadastral units is 3,914,753 (“teig” = cadastral parcel; one real property may include one or more parcels).  
The number of 3,914,753 is all parcels in the cadastre, the quality of the boundaries may vary and not all of them are surveyed. About 7 % of the parcels do not have a link to a cadastre number.  
The Norwegian cadastre is a result of many years of registering real property under various legislations. Today the cadastre is supposed to provide reliable information for the purpose of land administration. This was not its original role. The register started out as a way of allocating taxes. Consequently, the main focus was on the production value of the land and not on the physical extent and limits of the real property. The recording of the boundaries also reflects this. They have been established in various ways in line with the changing legislation and need for accuracy.  
The properties can have boundaries with high accuracy, approximately boundaries or a circle. It tells us about the quality of the cadastre measured by completeness. Most real properties can be found by searching for the cadastral number in the cadastre, but this tells us nothing about the quality of the boundaries.
- Scotland** As described in question 2, Scotland has a title registration framework. Cadastral elements were introduced in the Land Registration etc. (Scotland) Act 2012, which means that in terms of cadastral units we currently have a mixed model. In order to provide a representative figure at a national level we provided the total number of **registered titles**.

#### Remarks to Q9

- Czech Republic** no. of properties: 23 million parcels, 4 million buildings, 2 million flats (only in private ownership).
- Estonia** 573,085 immovables, 6,670 right of superficies, 521,270 apartment ownership.
- Italy** Considering that no specific definition of “property” is given, the following answers refer to the Subjects that hold real estate rights (specifically, if the same cadastral unit is owned by more than one subject, the number of “properties” is equal to the number of the owners; if the same subject owns more than one cadastral unit, the number of “properties” is equal to the number of the owned cadastral units). In case of different meaning of “property”, please don’t consider the following answers.  
→ no. of properties: about 268,5 million properties (119,7 million properties for real estate urban units + 148,8 million properties for land parcels)  
→ no. of those registered: 100% (approximately)
- Netherlands** The Netherlands land registration system is based on the object types parcels, condominium rights and networks. We do not specify properties.
- Scotland** (→ indicated numbers are registerable addresses) Scotland has a national address gazetteer (Ordnance Survey AddressBase). This address gazetteer is used as a proxy for properties. It should be noted that there is not a one to one correspondence between an address and a title. Whilst the majority of titles contain a single address, other titles can contain none or many addresses.
- Ukraine** StateGeoCadastre is responsible for the land parcel registration, but real estate and properties issues are concentrated under the responsibility of Ministry of Justice of Ukraine.

#### Remarks to Q10

- Estonia** Total number of different cadastral proceedings 26955. 13353 new parcels registered of which 5063 are very first time registrations with purpose of land reform. Change of addresses 882. Change of cadastral data 10391 (including geometry and corrections).
- Netherlands** no. of property mutations: 489,100 (2018) / mortgage deeds 421,600 (2018) / 65,200 parcel divisions as part of a transaction (2018) / 34,300 parcel division by the current owner (without corresponding transaction).

## Economic Indicators

Country	Q11)	Q12)			
	Total value of real estate in [billion EUR]	Total amount of mortgages in [billion EUR]	Population (EuroStat*, 2018)	Mortgage per popul. in [EUR]	Mortgage per value of real estate
Austria		~100	8,822,267	11'300	
Belgium	1,190 (2019)	34	11,398,589	8'800	8%
Bulgaria	n/a	10 (2018)	7,050,034	1'400	
Cyprus	n/a	304 (2018)	864,236	351'800	
Czech Republic	n/a	12 (2018)	10,610,055	1'100	
Denmark	n/a	n/a	5,781,190	---	
Estonia	80 (2018)	n/a	1,319,133	---	
Finland	790 (2012)	530 (2017)	5,513,130	96'100	67%
Germany	n/a	n/a	82,792,351	---	
Hungary	n/a	n/a	9,778,371	---	
Italy	8,215 (2017)	94 (2017)	60,483,973	1'600	1%
Kosovo	25 (2018)	1.3 (2017)	1,798,506	600	4%
Latvia	30 (2018)	8.2 (2017)	1,934,379	4'100	27%
Lithuania	100 (2018)	3.4 (2018)	2,808,901	1'100	3%
Luxembourg	n/a	n/a	602,005	---	
Netherlands	2,195 (2017)	702 (2018)	17,181,084	40'900	
Norway	n/a	362 (2019)	5,295,619	68'400	
Poland	n/a	n/a	37,976,687	---	
Portugal	n/a	n/a	10,291,027	---	
Romania	95 (2016)	122 (2018)	19,530,631	6'200	128%
Scotland	n/a	11 (2018)	5,424,000	2'000	
Slovakia	n/a	28 (2018)	5,443,120	5'100	
Slovenia	123 (2017)	n/a	2,066,880	---	
Spain	4,701 (2018)	n/a	46,658,447	---	
Sweden	1,160 (2018)	515 (2018)	10,120,242	50'900	44%
Switzerland	2,523 (2017)	875 (2017)	8,484,130	103'100	35%
Ukraine	n/a	n/a	42,216,766	---	

\* <https://ec.europa.eu/eurostat/web/population-demography-migration-projections/data/main-tables>

### Remarks to Q11

- Belgium** Total value 1,189,711,862,539 EUR (May 2019), this includes the dwellings such as apartments and houses and not the industrial and exceptional buildings such as farms, public buildings, etc.
- Netherlands** To provide an indication the total value of land transactions is:  
- agricultural properties 1,200 million Euros (2018 Q1 and Q2)  
- commercial properties 10,500 million Euros (2018)  
- residential properties 11,700 million Euros (2018 Q4)
- Romania** Not all properties are registered yet; for the time being, the value of all mortgages is therefore higher than the total value of real estates.

Country	Q13) Total income from land taxes  in [million EUR]	Q14) Annual income from property mutations  in [million EUR]	Annual income from land transac- tions  in [million EUR]	Q15) Annual costs for operating the cadas- tre  in [million EUR]	Annual costs for operating the land registry  in [million EUR]
Austria	~700 (2017)	~400	~1,100 (2017)	n/a	n/a
Belgium	5,789 (2018)	53	7,000 (2018)	53 (2018)	167 (2018)
Bulgaria	10 (2018)	2.7 (2018)	n/a	10 (2018)	n/a
Cyprus	n/a	n/a	n/a	1.9 (2018)	incl. cadastre
Czech Rep.	900 (2018)	0.6 (2018)	29 (2018)	120 (2018)	(CLR integrated)
Denmark	n/a	n/a	n/a	n/a	
Estonia	59 (2018)		3.8 (2019)	2.7 (2019)	n/a
Finland	n/a	36 (2018)	8,300 (2018)	36 (2018)	
Germany	12,000	n/a	n/a	n/a	n/a
Hungary	n/a	n/a	n/a	n/a	n/a
Italy	40,000 (2018)	191,000 (2018)	210,000 (2018)	n/a	n/a
Kosovo	27	3 (2018)	1 (2018)	3.5 (2018)	(CLR integrated)
Latvia	228 (2017)	8.4 (2017)	22 (2018)	14 (2018)	7 (2018)
Lithuania	37 (2018)	n/a	n/a	22 (2018)	(CLR integrated)
Luxembourg	n/a	n/a	n/a	n/a	n/a
Netherlands	3,838 (2017)		2,726 (2017)	190	(CLR integrated)
Norway	1,470 (2017)		36,965 (2018)	n/a	n/a
Poland	n/a	n/a	n/a	n/a	n/a
Portugal	n/a	n/a	n/a	n/a	n/a
Romania	n/a	1.9 (2018)	4.8 (2018)	n/a	n/a
Scotland	n/a	9.2 (2018)	61 (2018)	39 (2018)	(CLR integrated)
Slovakia	n/a	n/a	n/a	35 (2013)	(CLR integrated)
Slovenia	203 (2013)		46 (2018)	1.3 (2018)	n/a
Spain	16,395 (2018)	0	n/a	106 (2018)	n/a
Sweden	n/a	89 (2018)	16 (2018)	185 (2018)	incl. cadastre
Switzerland	n/a	85 (2017)	n/a	45 (2017)	n/a
Ukraine	800 (2018)	3.4 (2018)	500 (2018)	2.6 (2019)	n/a

#### Remarks to Q13

- Italy The following answer includes recurrent and non-recurrent taxes on the use, ownership or transfer of property → total income from land taxes in [billion EUR]: 40 (year: 2018)
- Sweden A traditional land tax is not applicable in Sweden, since some years back there is however a so called property charge to be paid to the Tax Agency; Lantmäteriet is responsible for the collection of stamp duties and fees which in 2018 amounted to about 12,000 million SEK.

#### Remarks to Q14

- Belgium Income from property mutations: no costs for the citizen for a property mutation in itself; but an average annual increase of 52.806.138 EUR in Cadastral Income due to physical changes in properties.
- Netherlands Kadaster (Cadastre and Land Registry) operates on a cost-recovery regime and the fees over the years should compensate for the costs made. → total income from transfer tax for land transactions 2,726 million Euro (2017).

### Remarks to Q15

- Italy** The information is not available. Since 2012 cadastre and land registry management has been a competence of the Italian Revenue Agency (as a result of the incorporation of the former Cadastre and Land Registry Agency), public body with a much wider mission and organization.
- Netherlands** Kadaster operates as an integrated cadastre and land registry agency. By law, the agency as a whole operates under an average fee-based cost recovery regime over the years, with costs in the range of 190 million Euros.  
Note that from a user's perspective it are the total costs of a land transaction that matter: these also include e.g. the costs of the notaries, transfer tax etc.

### Issues and Opportunities

Country	Q16) Where, do you think, that the <b>cadastre</b> provides (economic) <b>benefits</b> ?	Q16) Where, do you think, that the <b>land registry</b> provides (economic) <b>benefits</b> ?
Austria	---	---
Belgium	Unambiguous identification of real estate - free access to a GIS dataset of cadastral parcels, revenue from the Property Tax, ...	Security in transactions, the pre-cadastration of parcels.
Bulgaria	In good planning and management of land resources, in higher investments in land.	There are benefits for mortgage finance, better access to formal credit, higher land values, higher investments in land, higher output/income.
Cyprus	Very effective management, affecting positively the economy of the country	Guarantee of property rights, affecting positively the economy of the country.
Czech Republic	Reliable and accurate records in the cadastre and the land registry allow to invest with confidence in the real estate business (the real estate and mortgage market, taxation and property evaluation), which provides economic benefits to all subjects in the real estate market.	
Denmark	identification	trustworthy
Estonia	It is obvious. We have an active real estate market and the economy is booming.	
Finland	Foundation of functioning lending and mortgaging system i.e. economy.	
Germany	Cadastre is an important part of the property protection system.	
Hungary	Safe transactions provides safe business environment. Accurate cadastral boundaries ensures safe investments.	
Italy	As inventory of the real property present throughout the national territory, cadastre supports national and local fiscal and land management policy decision-making in the real estate field.	Legal certainty for land tenure, also as a condition for mortgage lending.
Kosovo	Cadastre and land registry provide benefits for property security as a basis for the economic development of the country.	
Latvia	Property related Government/Municipality Tax income; better results of Spatial Planning and Building development plans.	Safe real property market, more trust from buyers (investors), added value of safety to the whole economy which is based on private property.

Country	Q16) Where, do you think, that the <b>cadastre</b> provides (economic) <b>benefits</b> ?	Q16) Where, do you think, that the <b>land registry</b> provides (economic) <b>benefits</b> ?
Lithuania	The Real Property Cadastre and Register are integrated, therefore the economic benefits are inseparable. The economic benefit is for all: citizens, government and businesses, because only legally formed, surveyed and registered land parcels and other real property units ensure better management of private and public property, create better conditions for secure real property and credit market and increases its efficiency. Real property used as collateral enhances access to capital and provides better opportunities for investments. Well organised and effectively operating real property cadastre and register enables to reduce the number of land disputes, creates better conditions for territorial planning and infrastructure development. Real property cadastre and register provides basis for real property taxation and supports social issues when providing services and ensuring social equality. The secure land ownership and efficient land and other real property registration is of crucial importance for economic growth and prosperity of the country.	
Luxembourg	The cadastral map covering 100% of the national territory is the only representation of the real estate in its smallest units (parcels) and essential for all project belongings considering the property. All geographic information is available via géoportail.lu and is Open Data formatted.	Restricted Access for citizens in respect to the GDPR; open access for administrations and government according to their legal attributions and in respect to GDPR
Netherlands	The value of C&LR is primarily that Kadaster provides transparency in the land market and thereby eases executing transactions in the land market. In economic terms the economic benefits are directly related to lowering (or almost eliminating) failure costs with and for our partners and actors in the land market.	
Norway	The cadastre may act as a key link to information from other registries. The cadastre is important for planning. The realization of a land use plan also includes changes in real property. The information will mainly be found in our cadastre, with supplement from other registries. The cadastre also include information about addresses which is crucial information e.g. for the ambulance. The third part of the cadastre is the building information which gives an economic benefit. Developing and evolving our built environment involves information from the cadastre.	Security of land transactions and rights in land. The main consequences of having a well-designed and up-to-date system is to lower transaction costs and provide security for both sellers and buyers in transactions involving real property. This is important for the economic development of a society.
Poland	---	---
Portugal	Fiscal (Tax), Justice (legal business), Territorial planning (permitting processes), Financial (insurance and banking).	n.a. (competence of the IRN)
Romania	Level of trust on the "reality" of a property (with consequences on taxation, investment, GIS analysis policy making, etc).	Gives security for real rights transfers (impact on investment, mortgaging, real estate loans).
Scotland	The cadastral map forms part of the Land Register.	The Land Register plays a pivotal role in the Scottish economy by providing a publicly guaranteed system of rights in land and property. The Land Register provides a clear and unambiguous knowledge of who owns land in Scotland, making it simple to work out who owns a property, what they own and what restrictions, burdens and securities apply to that property.
Slovakia	C+LR data is open and available for general public	

Country	Q16) Where, do you think, that the <b>cadastre</b> provides (economic) <b>benefits?</b>	Q16) Where, do you think, that the <b>land registry</b> provides (economic) <b>benefits?</b>
Slovenia	Information on real estate provides easier and faster space management, access to information about the space that is crucial for decisions regarding the use of space and events related to the space for all users (state authorities, local community bodies, legal and natural persons).	---
Spain	<p>In Spain the economic benefit of the cadastre is provide in many issues but the most direct is the taxation. The cadastre provides the cadastre values. Cadastral value is an administrative value and it is the basis for or it is taken as reference in the actions of the Public administration.</p> <p>From a tax point of view is used in: recurrent property tax, income tax, wealth tax, tax on increase in value of urban land etc.</p> <p>From a non-tax point of view is used as official value in: expropriations, urban assessments, certain types of aids, mortgages, scholarships and grants, etc.</p> <p>The values are very well accepted by citizens and are the official values in the administration. These values are calculated by cadastre using the data of cadastre combined with other external data.</p> <p>RECURRENT real estate tax is the main income of the Spanish municipalities. 14.800 millions € approx. in 2018. Therefore, <b>Cadastre is Indispensable for the financing of the Local Administration.</b></p> <p>The Ministry has calculate that <b>1 euro that the government invests in Cadastre generates 7 euros of income for the municipalities.</b></p> <p>Cadastre also provides free of charge a lot information that is used widely by public administration and private companies and citizens. Serving daily 1.1 million consultations and almost 21.000 certificates and enabling maps downloads at a rate of over 180 million per year. The savings in hours of work and money are huge.</p> <p>Also, but “<b>not easily transform in economic value</b>” cadastre permits the work of the property market and it is determinant for rights, security a social protection</p> <p>Also important from the economical point of view, the Tax Agency uses 'big data' tools to cross-cadastral data with data from various sources to prosecute tax fraud.</p>	---

Country	Q16) Where, do you think, that the <b>cadastre</b> provides (economic) <b>benefits</b> ?	Q16) Where, do you think, that the <b>land registry</b> provides (economic) <b>benefits</b> ?
Sweden	By contributing to a sustainable smart built environment and economic development in co-operation with other authorities by creating prerequisites for: → cadastre: build and develop real properties and infrastructure.....	→ land registry: property market, securing of ownership by confirming the stated rights ; access to credit by using the land as collateral for a loan; assurance for future prospective buyers that the registered owner is the legal owner; transfer of properties (buying, selling, owning etc.)..... → by making geodata useful and available to society by assisting land use planning and development, by creating a basis for land taxation and stimulate investments ; as well as securing the geodetic infrastructure,
Switzerland	Legal and thus economic and social security providing stability.	
Ukraine	Having geo-reference, cadastre may be utilized for visual territorial planning and attraction of the investments. Further development of land cadastre (e-services, additional layers of information) will be a vital source of official information.	Is important to secure the right of owners.

Country	Q17) Are there any issues in the <b>cadastre</b> that <b>hamper</b> the economic benefits?	Q17) Are there any issues in the <b>land registry</b> that <b>hamper</b> the economic benefits?
Austria	---	---
Belgium	Privacy and GDPR, Belgium is a federal state, so divided powers and necessary cooperation between public institutions on different levels and private sector (Notary and Surveyors).	
Bulgaria	Lack of personnel in public sector, heavy public procurement procedures.	---
Cyprus	relatively slow response from other government departments, delay the processing of cadastral and land registry applications.	see cadastre
Czech Republic	Insufficient accuracy of the parcel borders registered and not updated information about the technical data about parcels (its use or protection), which complicates investments into new constructions or slows down the real estate transactions, where the area of the parcel is important parameter for the price etc.	
Denmark	Slow updating	Bureaucratic workflows
Estonia	The main issue is the quality of the cadastral data (mainly geometry issues) in Estonian context. High quality cadastre data would help to perform different land management procedures, which allows an easy, quick and cheap performance of land management activities increasing thus the turnover in the property market.	---
Finland	Not as such but improved digitalisation and services would raise the level.	
Germany	---	---
Hungary	Financing of cadastre by the state. Lack of human capacity of cadastre.	
Italy	The updating of cadastral legal framework.	Sometimes it's necessary to extend the inquiry to the paper archives.

Country	Q17) Are there any issues in the <b>cadastre</b> that <b>hamper</b> the economic benefits?	Q17) Are there any issues in the <b>land registry</b> that <b>hamper</b> the economic benefits?
Kosovo	Cadastre and land registry: To be solved the current organizational issue of KCA with Municipal Cadastral Offices in two levels. Vertical organization of KCA with MCOs which is in process will provide unique procedures, quality of data and better services for citizens.	
Latvia	Lack of actual data or incomplete data for part of cadastral units.	Data that are not always in line with those of cadastre.
Lithuania	The quality of some of land parcel boundaries surveyed during the land reform should be improved.	
Luxembourg	No detailed and accurate survey for the integral territory.	No price information for the real estate transfers.
Netherlands	It might be that policy developments related to GDPR and cybersecurity limit the accessibility to land and property information.	
Norway	Lack of information and the accuracy of the boundaries.	Lack of registration of land rights.
Poland	---	---
Portugal	Difficult on the implementation of interoperability between the different public systems involved.	n.a. (competence of the IRN)
Romania	Delay of surveying at the national level (due to historical reasons: confiscation of land, property restitution, lack of property deeds/evidence, etc).	The same as above, plus tardiness in adapting the legal framework to the needs/expectation of today: speed, availability, flexibility.
Scotland	The cadastral map forms part of the Land Register.	Our current state is driven in part by a document heavy Title sheet and Plan solution. While electronic, the land rights of complex titles have to be interpreted to unlock the full potential of the underlying information. The modern, map-based Land Register has only existed since 1981 and is not yet complete. As at 31 Jan 2019, there are 1,808,661 titles on the Land Register representing 66.7% of the total. The land mass this represents is 33.8% of Scotland's circa 8m hectares. Scottish Ministers have set a target to complete the Land Register by 2024
Slovakia	---	The procedure times for registering rights to real estates could be shorter. Improvement in this area could provide some economic benefits.
Slovenia	Time of procedure, quality of data.	---
Spain	The quality of data (physical and values) need to be improved continuously. Interoperability with other data to offer added value is not always possible (standardization, metadata and quality is necessary).	---
Sweden	quality of the information, long handling times as to real property formation, double storage of information in some cases, lack of marine information in relation to real properties, legislation that might need further development...	registration of owners without unique international valid identification numbers in the land register...
Switzerland	Efficiency can be improved.	---

Country	Q17) Are there any issues in the <b>cadastre</b> that <b>hamper</b> the economic benefits?	Q17) Are there any issues in the <b>land registry</b> that <b>hamper</b> the economic benefits?
Ukraine	In order not to hamper the economic benefits cadastre should be as much full, as possible and has minimum mistakes (overlapping, etc.).	Land registry and land cadastre must be interoperable (as it is in Ukraine at the moment)

Country	Q18) Are there any <b>developments</b> in the <b>cadastre</b> that will potentially improve the economic relevance?	Q18) Are there any <b>developments</b> in <b>land registry</b> that will potentially improve the economic relevance?
Austria	---	---
Belgium	INSPIRE – GIS Web services – open data, cooperation with surveyors and project “pre-cadastration online”, integrated permit system between the regions and the federal state	---
Bulgaria	Development of information systems, addition of other spatial data to the cadastre.	---
Cyprus	Full computerization of all records, and effective operation of a fully integrated Land Information System supports and improves the economy. The existence of open digital authoritative and up-to-date data and services help significantly.	see cadastre
Czech Republic	In 2014, a new Cadastral Law was adopted in connection with the new Civil Code, which confirmed the conceptual changes in the legal rights records. This new legal framework brought the legal principle of material publicity and everybody now can have confidence in the records in the land registry.	
Denmark	More secure identification of all properties and better coherence across public records.	
Estonia	Continuous improvement of laws and regulations simultaneously with IT developments.	---
Finland	3D real estates can since Aug 1, 2018 be registered.	National digital housing company and shareholding registration.
Germany	---	Launch of DaBaG (data base land register), probably in 2022.
Hungary	Introduction of E-Land Registry under development.	
Italy	The continuous improvement in cadastral data quality as well as in the provided services to users.	The continuous backward enlargement of the period of digitalisation of the land registry archives.
Kosovo	Cadastre and land registry: Kosovo Cadastral Agency is running the projects for massive registration of property units (parcels, buildings and part of buildings), which will affect and improve economic relevance. In addition, KCA is working in improving the cadastral and land registry services to citizens through e-governance.	
Latvia	Widened data sets of cadastral objects, wider data publicity – more open data for users.	Structured folio info for easier machine reading, integrated official state e-address functionality for added/enhanced electronic process functionality.

Country	Q18) Are there any <b>developments</b> in the <b>cadastre</b> that will potentially improve the economic relevance?	Q18) Are there any <b>developments</b> in <b>land registry</b> that will potentially improve the economic relevance?
Lithuania	There are quite a few projects under implementation in order to improve the operation of real property cadastre and register system in Lithuania and its interaction and interoperability with other registers and information systems; such as implementation of 3D cadastre, improving the integration with related information system of other institutions in the area of territorial planning, issue of construction permits, documents for completion of construction, restrictions on land use, change of the purpose of land use.	
Luxembourg	OpenData since 2018	Limited Access to everyone in respect to the GDPR
Netherlands	Increasingly all rights, restrictions and responsibilities are part of our system and thereby providing more information on properties. Moreover, we see the cadastre becoming an integral part of digital government and providing benefits also outside the land market itself. At the European level, the Single Digital Gateway is one of these initiatives.	
Norway	Projects to increase the accuracy of the information in the cadastre, electronic handling of cases concerning registration in the cadastre, APIs and other communication between the cadastre and other registers.	Development of digital solutions, electronic registration.
Poland	---	---
Portugal	It is necessary the political commitment to guarantee the involvement of public agencies responsible for the different databases that ensure data harmonization and interoperability between systems.	n.a. (competence of the IRN)
Romania	Completion of general cadastre program at national level.	Increasing the level of automation in the sense of direct access to the Land Book information, integration of services at the level of public administration.
Scotland	The cadastral map forms part of the Land Register. Our future state aspires towards a move "from documents to data", with a data driven deed and land right register deriving cadastre and title driven products. When implemented, this will accelerate automated land registration and allowing for increased analytical capabilities of the source data.	The launch of ScotLIS on 24 October 2017. This service revolutionises the way our customers interact with our data by offering an online, map-based land information service, with access to a wealth of information about land and property in Scotland. As we enhance the service, for example through improved, cheaper citizen access and the inclusion of additional layers (crofting and aerial imagery) combined with our work towards completion of the Land Register, this will serve to improve the economic relevance. The interim development within our Land register will improve the capture and attribution of our spatial right extents. Improving the certainty of land rights, ownership specifically, will significantly help enhance our analytical capabilities.
Slovakia	---	---
Slovenia	Information and legislative renovation of real estate records, which will shorten the time required for the execution of procedures and improve the quality of data.	---

Country	Q18) Are there any <b>developments</b> in the <b>cadastre</b> that will potentially improve the economic relevance?	Q18) Are there any <b>developments</b> in <b>land registry</b> that will potentially improve the economic relevance?
Spain	Strategic work to anticipate any possible change in the reality that must be recorded in the cadastral data. Improving collaboration with other institutions. Better system to update real estate valuations easily. Better digital services. Better feedback from the citizens.	---
Sweden	improved quality of information contents, digitization of property formation processes for a future vision including – more digital, correct information, guidance through processes, up-to-date legislation, wider use of the information with better quality...	smart contracts, automation of the process, towards totally digital ... also as to on-going project as to smart planning and building process including national platform for geodata in co-operation with other authorities
Switzerland	Extension of content, i.e. establishing the PLR Cadastre, which documents Public-Law Restrictions.	---
Ukraine	Additional layers of information, geo-reference data and development of e-services are key factors.	---

Country	Q19) Do you see any <b>opportunities</b> for the <b>cadastre</b> to enhance the economic benefits?	Q19) <b>Opportunities</b> for the <b>land registry</b> to enhance the economic benefits?
Austria	---	---
Belgium	Data reutilisation with other administrations : Addresses – buildings	Mapping data between land registry and National Register f.i. for tax purposes.
Bulgaria	Creating an address register.	---
Cyprus	Further improvement of on-line services.	see cadastre
Czech Republic	Completion of the accuracy improvement project and development of the interconnection between relevant state information systems related to the land registry and the cadastre are the most important future steps to enhance the economic benefits. Another opportunity is enlargement with data regarding complex overview about public-law restrictions.	
Denmark	---	---
Estonia	Increase the usage of cadastral data, make them public and open as it is done in Estonia where cadastral data is open data.	---
Finland	Hard to find new aspects beyond the above mentioned.	
Germany	---	---
Hungary	Spatially Enabled Society as an objective of a Government Programme.	
Italy	Simplification of processes and easy access to the cadastral services, as well as interchange of data with other Public Administrations also in order to increase land management efficiency.	Full integration with cadastral data in order to settle a database of the real estate taxpayers.
Kosovo	Cadastre and land registry: Same as Q18.	

Country	Q19) Do you see any <b>opportunities</b> for the <b>cadastre</b> to enhance the economic benefits?	Q19) <b>Opportunities</b> for the <b>land registry</b> to enhance the economic benefits?
Latvia	Obtaining new data without involvement of property owners and direct renewal of existing data in cadastre system. Involvement of the owners for voluntary data update.	Offer clearly identifiable actual information instead of full folio data and facilitate a fully electronic registration process for broader reach than currently available.
Lithuania	Improved integration with other registers and information systems (see Q18) and opening of data.	
Luxembourg	OpenData for all planning and political belongs.	Full accessibility for users executing a legal mission
Netherlands	The adaptation to climate change will require that investments are required to improve the sustainability of the built environment. These investments need to be financed and will/might lead to new financial-juridical options rather related to the object itself than the right holder. Furthermore moving towards a more circular economy will require that also the physical characteristics of built object will be either integrated in or connected to the cadastre and/or land register.	
Norway	Electronic exchange of information gives benefits both for private, municipalities and governmental bodies.	Electronic exchange of information gives easier access to information especially for real estate agents, developers, etc.
Poland	---	---
Portugal	Involvement of private sector on cadastre execution will allow leverage the economy.	n.a. (competence of the IRN)
Romania	More relevant spatial datasets to be included in the system and availability of services dedicated to the investors' needs.	Decreasing the time needed to register a real right.
Scotland	The cadastral map forms part of the Land Register.	Ongoing enhancements to our ScotLIS service e.g. incorporating additional layers – potential for third party data sets (both public and private sector) to provide a single authoritative source for geospatial data.  We also investigating options around opening up some of our datasets, to stimulate the use of land registration data, and support data-driven innovation for wider economic benefit.
Slovakia	Yes, the C +LR should focus more on land consolidation; address the high fragmentation of land and address the minimal ownership shares by a legislative form.	
Slovenia	Providing information to users in one place, common procedures.	---
Spain	Integration with other data to be used in new policies and digital services.  Potential tool for energy, climate and sustainability monitoring.  Internet of things.	---
Sweden	marine cadastre (blue economy and sustainability), digitization of planning and building processes sharing information between state agencies...	land registry: land register interconnection project for cross-border activities..... → with correct information (quality) decisions will be easier, in some cases even automated
Switzerland	---	---
Ukraine	Land cadastre is foreseen to be the part of NSDI continuing providing the official references to the users.	---

Country	Q22) Do you have any other remarks or suggestions (to this questionnaire, to the topic in general, or for the planned conference)?
Austria	<p>Literature:</p> <p>MUGGENHUBER, G., MANSBERGER, R., NAVRATIL, G., TWAROCH, C. &amp; WESSELY, R. (2015): VI Kataster als Ausgangspunkt einer flächendeckenden Liegenschaftsbewertung. In: Twaroch, C. &amp; Wessely, R. (Hrsg.). Liegenschaft und Wert: Geodaten als Grundlage einer österreichweiten Liegenschaftsbewertung mit einem Vergleich der Wertermittlung von Liegenschaften in ausgewählten Ländern Europas. Wien: NWV - Neuer Wiss. Verl., 153–180, see page 173ff.</p> <p>TWAROCH, C. &amp; MUGGENHUBER, G. (1999): Grund und Boden als ökonomische Größe. In: Institut für Geodäsie (Hrsg.). X. Internationale Geodätische Woche: Fachvorträge. Innsbruck, 193–204. = Muggenhuber, G. &amp; Twaroch, C. (1999): Ökonomische Aspekte des Liegenschaftsmarktes. In: Rechberger, W.H. (Hrsg.). Wiener Konferenz über Grundbuch und Kataster: II. Session 1998. Veröffentlichungen des Ludwig-Boltzmann-Institutes für Rechtsvorsorge und Urkundenwesen Bd. 21. Wien: Manz, 61–78.</p> <p>WESSELY, R. (2002): Do we need to make society more aware of the benefits of the land administration system?: Suggestions for an awareness campaign and a business plan of the land administration system. In: UN-ECE WPLA Workshop: Customers Cooperation Services.</p>
Cyprus	<p>Note 1: Some of the questions refer to economic figures, which involve other government departments, and they are very difficult to gather.</p> <p>Note 2: Cadastral and land registration transactions are implemented within the same department.</p>
Finland	Some of the questions and/or terms used are difficult to understand or relate to.
Italy	A general glossary of used terms would have been useful in order to better understand the questions and consequently to give coherent and homogeneous answers (condition for a comparative analysis).
Netherlands	In filling in this questionnaire we have found it difficult the precisely assess the value the value of cadastre and land registries in the economic sense.
Norway	Since the understanding of terms are not the same in all jurisdictions, a glossary would help to give answers that are more accurate.
Portugal	In Portugal we have rural property cadastre only for tax purposes and real property cadastre for multipurpose.

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